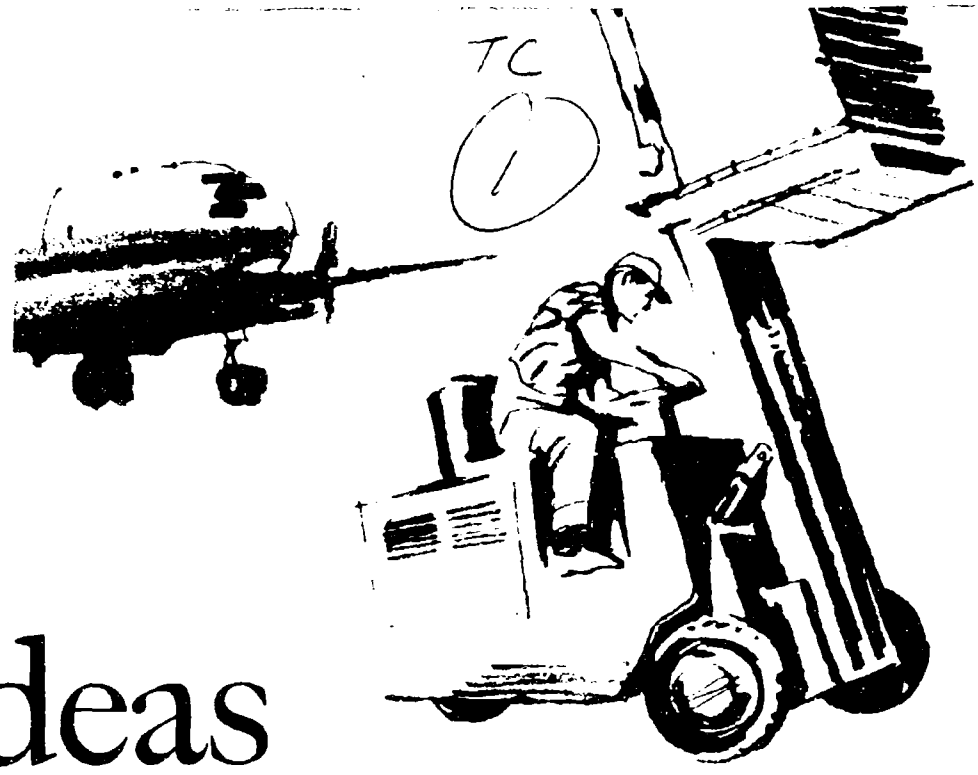
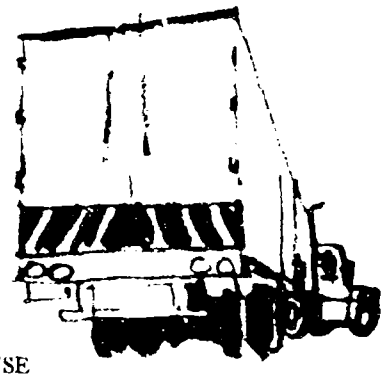


Ideas for Managers



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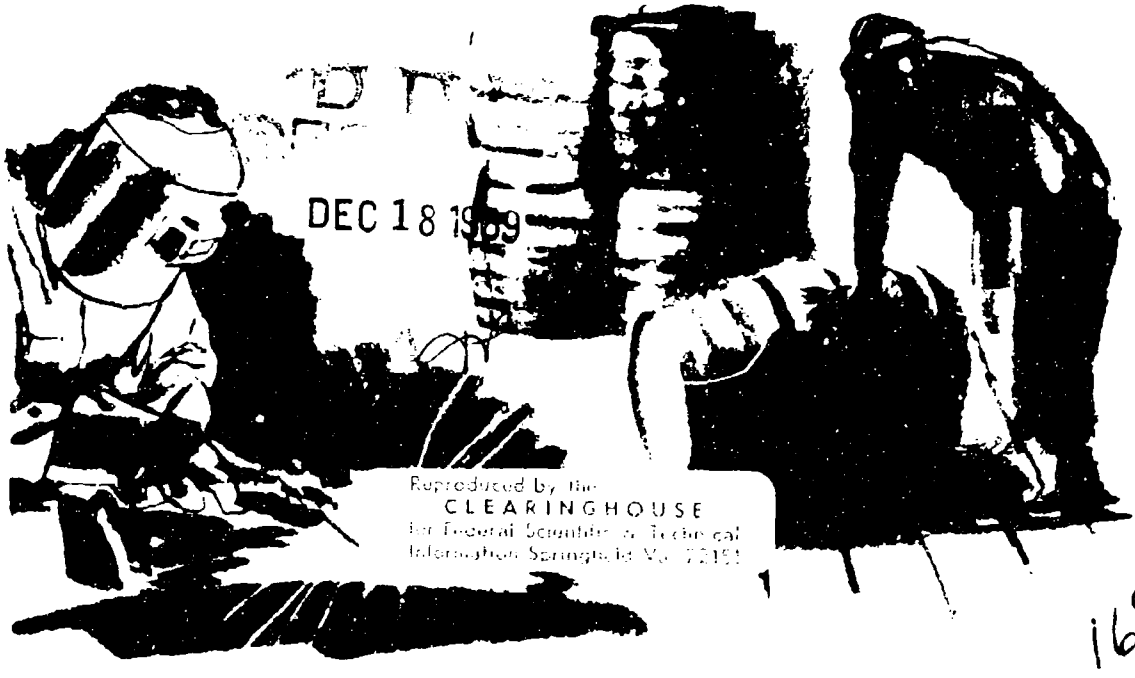

Ideas for Managers

A digest of actions for Increasing Efficiency and Economy in the Management of Defense Activities

DIRECTORATE FOR COST REDUCTION AND
MANAGEMENT IMPROVEMENT PROGRAMS

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
(INSTALLATIONS AND LOGISTICS)

Department of Defense • Washington, D.C. 20301

Foreword

Cost cutting insights that reap small rewards at one locale or in a relatively minor function could conceivably save substantial sums when extended to other locales and functions. Ideally, a progressive organization should run up maximum mileage from a good idea. However, the more structured the organization is, the rougher the going.

Ideas within a basic unit of organization usually find easy transferability. That is because the "boss" at that level is close enough to the action to see the potential and to personally promote the idea. Transferring managerial knowhow among units in the same organization is a tougher job—and the hurdles become harder to negotiate as an idea moves up the managerial hierarchy, remote from the site of its initial application.

I personally believe that "lost opportunities" occur less from any parochial resistance by higher level administrators than from the lack of a procedure for regularly exchanging and systematically appraising ideas. A workable procedure would call for:

1. Source material from which to extract ideas, and
2. An informed board, council, or other reviewing body (in every management echelon) that is sufficiently imaginative in finding new applications for ideas already in use elsewhere and sufficiently respected to sell its recommendations both up and down the line.

This pamphlet, which organizes a thousand cost-saving ideas with relevant bibliographies for wide distribution throughout the Department of Defense, serves as a starting point in the procedure by showing how existing management data can be cataloged and disseminated. However, it does not serve the ends of Step 2 in the procedure, i.e., assurance that these ideas will be evaluated and adapted to new situations. Only interested, cost concerned managers can bring about that outcome.

BARRY SHILLITO
Assistant Secretary of Defense
for Installations and Logistics.

Preface

This publication seeks to make it easier for Defense managers to rediscover the wheel.

Good management ideas should make the rounds as quickly as possible. Most, however, do not. It is a sad fact of managerial life that many good ideas become permanently landlocked in the organization of origin. Still others pop up elsewhere belatedly and then only by chance.

Everyone agrees that a management improvement producing a small savings at one military installation should find quick currency at other military installations so it can run up big savings. What prevents an easy transfer? The big obstacle is that managers at these other installations are not aware that there is a "better way" to manage. Awareness occurs only through rediscovery or crossfeed. The latter, of course, is by far the speedier, more efficient route.

The Department of Defense documents 25–30 thousand cost reduction actions every year. Attempts to cross feed have been limited to hit or miss departmental cross-feed newsletters and other more or less informational media. Very few of these cost reduction actions receive wide publicity—and nowhere have they been catalogued for a manager's ready reference.

This "ideas" book attempts to partially fill this void. The book contains over 1,000 ideas for improving the management of Defense resources. These ideas were distilled from the many thousands of cost reduction actions that contributed savings of $16.5 billion to the Department of Defense Cost Reduction Program from fiscal year 1962 through fiscal year 1968.

Some of the actions described in this compilation appear inordinately simple—matters of everyday good management practice. However, the reader should keep in mind that moving even small bureaucracies to replace substandard practices with ordinary good management is sometimes a mountainous task. When such a change saves

money, is it just as much a "cost reduction" as any caused by a major study that improves on everyday good management.

The compilers have tried to state each idea as a principle extracted from similiar kinds of cost reduction actions. Sometimes, the principle is illustrated by a parenthetical description of a cost reduction action. By and large, however, descriptions of individual cost reduction actions are avoided.

This book has 14 sections. Each section contains:

- A description of a cost reduction area
- A codification of the principles derived from cost reduction actions in that area
- A bibliography of relevant management improvement material for that area

The principles in each section have been organized within subclassifications of the section for ready accessibility. For example, the following two-level stratification of the area entitled *Real Property Maintenance and Operations* shows how management improvement ideas in that area are codified.

- Maintenance of Real Property
- Minor Construction
- Other Engineering
- Operation of Utilities
  - Heating
  - Water and Sewage Systems
  - Air Conditioning and Refrigeration
  - Electrical
  - Other

Certain principles falling within one area have relevancy to other areas, and where this occurs the principle has been restated rather than cross-referenced in order to assure that each section is self-contained. Thus, to this extent, the reader will find a minor amount of repetition among the sections.

The compilers recognize that their inventory is not all-inclusive and perhaps can never be made all-inclusive because of the volatility of the subject matter and the tremendous mass of data available. However, the publication does present a starting point for managers and operators who want a source document for ideas and a reference document to help them solve their problems.

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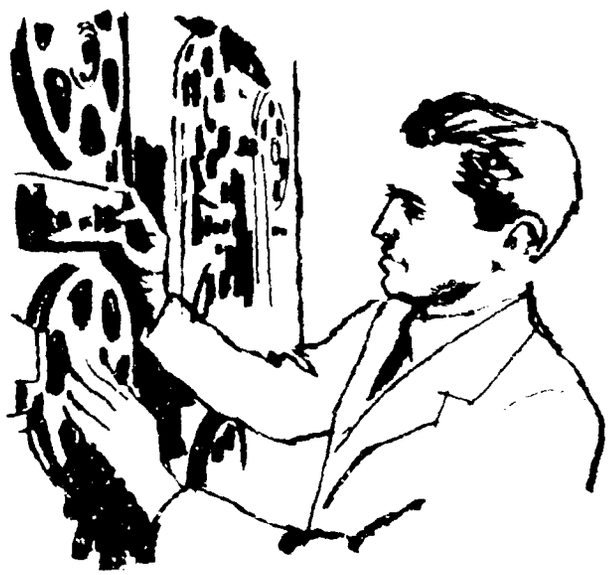
c. Screening Techniques
d. Reductions in Echeloning/Allowances
e. Budget/Procurement Techniques



Initial Provisioning

Defense buys about $18 billion worth of aircraft, tanks, missiles and other end items of equipment each year—and, at the same time, spends another $1.4 billion annually for spares and repair parts to initially support these end items. These concurrently purchased spares and repair parts are acquired through an Initial Provisioning Process. This process establishes realistic requirements (kinds and quantities) for an initial support period. Wearout rates, repair time, distribution factors, etc., figure in the requirements computation. A saving occurs each time a new, improved or intensified management action reduces the initial provisioning costs.

A. Selective Management Techniques

Allowance Parts Lists.—Reduce contractor's recommendations on repair part quantities based on equipment specifications by comparing with existing allowance parts lists for similar type equipments.

Consolidated Requirement.—Consolidate wholesale supply system requirements for common-use items used to support multiservice aircraft and other equipment by applying Wholesale Interservice Supply Support Agreements (WISSAs), or by establishing a Joint Support List (JSL) for such items.

General Purpose Equipment.—Utilize general purpose equipment where feasible for special tasks, e.g., initial requirements for special missile handling trucks were eliminated by utilizing trucks in inventory which were being used as general purpose handling trucks.

Modification.—Modify obsolescent equipment to required configuration, e.g., (J79–GE–2 afterburners to J79–GE–8 configuration).

Phased Provisioning.—Make maximum use of Phased Provisioning techniques (Ref. DoD Instruction 4140.19). (Contractor in-production assets for selected items are prearranged to serve as buffer stock for backup support to the supply system in lieu of initial procurement of full-computed quantities.)

Teams.—Use resident provisioning teams (RPTs) to assure intensified review of spares requirements for major end item production programs.

B. Maintenance/Failure/Overhaul Engineering Estimate/Usage Experience

Availability.—Accelerate development of experience data on new items and application of this data to requirements computations.

Base Repair Capability.—Employ a time-phased factor for base repair capability in requirements computations for recoverable type items rather than a factor representing current experience. (This will insure credit in the computation for an ascending base repair capability.)

Design Life.—Procure replacement printed circuit boards based on design life of individual boards rather than procure complete board sets.

Life Expectancy.—Examine items procured based on a specified replacement life to insure that the life expectancy is valid.

Reliability.—Anticipate projected improvement in reliability extending the service life/removal interval for items undergoing product improvement programs.

Repair Cycle.—Compress the number of days Hi-Value items remain in the depot repair cycle by intensified management of these items.

Replacement Factor.—Develop an Experienced Demand Replacement Factor which is computed by taking a ratio of replenishment demand to active item population over the appropriate time base indicated by the demand. (This substantially reduces provisioning buys generated under the old Replacement Factor based on the provisioner's personal knowledge of the equipment and estimated demand rate.)

Replacement Factor.—Develop a Mean Family Replacement Factor in lieu of the former Replacement Factor when experienced demand is not available. (This results in a new formula which reduces the stock level base from 12 months to 3 months thereby substantially reducing initial system buy quantities.)

C. Screening Techniques

Governmental Furnished Materiel.—Screen for use of government furnished materiel in lieu of contractor furnished materiel, or vice versa, when economy would result from the change.

Government Owned Assets.—Screen government owned assets in the custody of contractors and apply applicable assets to other requirements whenever possible.

Inventories.—Screen existing assets prior to procuring items to determine whether available items can be modified at less cost to meet the requirement.

D. Echeloning/Allowances for Spares and Repair Parts

Floating Pool.—Consider a floating pool concept (assets are repositioned to operating units) to support multiple installations of the same weapons system. Application of this concept to weapons systems on 38 ships resulted in a significant reduction in required spares as opposed to individual outfitting of each ship.)

Kits.—Consider adopting policy to provide pack ups (support kits of parts) to support helicopter squadrons in lieu of outfitting Helicopter Carriers (LPHs). (This same policy was used to provide support for C–2A aircraft on Attack Carriers (CVAs) in lieu of complete outfittings.)

Support Level.—Consider policy specifying percentage level support for shorter period in lieu of hours-of-operation support over a longer period. (Revised policy specifies that allowance lists will provide 90 per cent support for 90 days on demand based items. Application of this criteria in lieu of the old criteria of support for 4000 hours of operation or 1 year substantially reduced allowance list requirements.)

E. Budget/Procurement Techniques

Funding.—Establish periodic management analysis of percentage factors applied to end item costs for estimating initial spares dollar requirements.

Kits.—Combine procurement of modification kits with end item procurements to achieve reduced kit costs.

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II.

Secondary Items

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b. Reducing Maintenance, Failure and Removal Factors/Rates
c. Reducing Echeloning of Stocks
d. Changing Repair Cycle Factors
e. Improved Procurement Techniques
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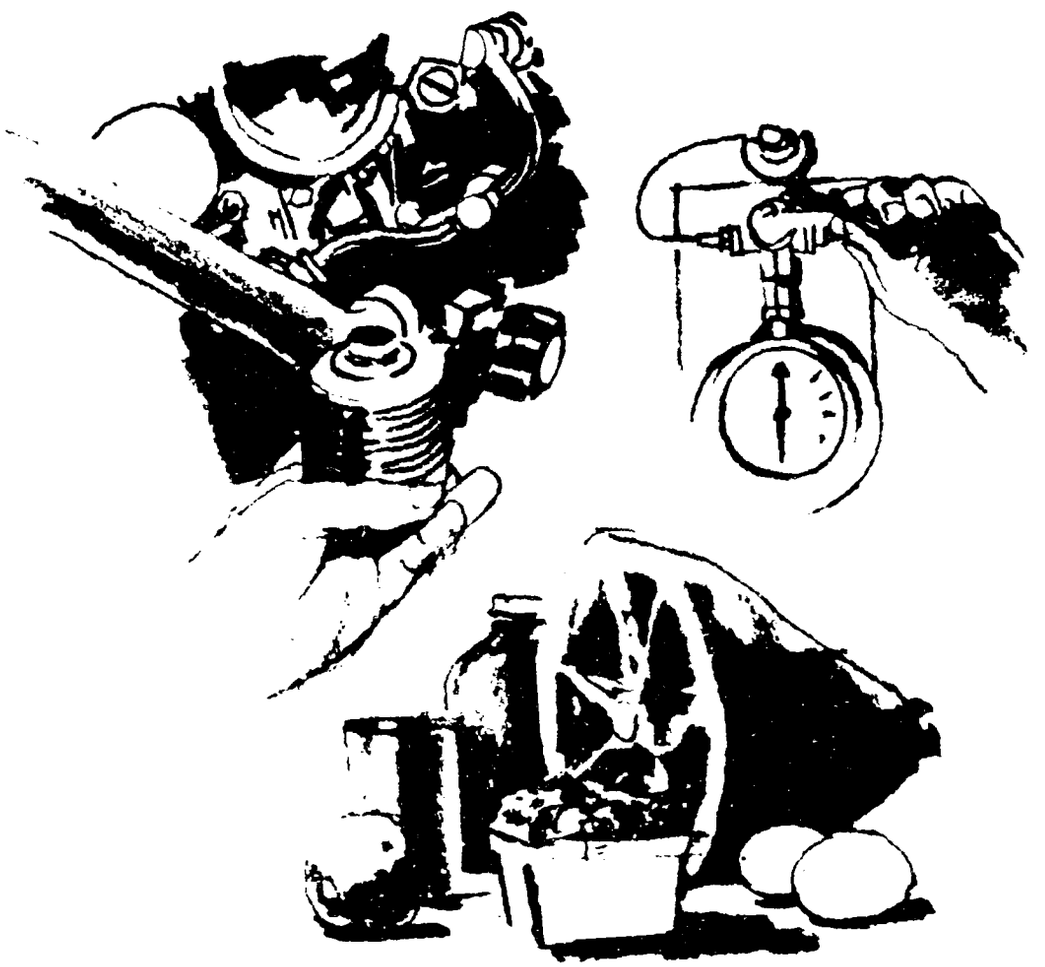

Secondary Items

Defense owns, operates and maintains $100 billion worth of capital equipment (e.g., aircraft, ships, tanks, guns). Usage causes all equipment to fail sooner or later. Replacement parts must be available immediately to make the failed equipment serviceable again.

The Initial Provisioning Process (see Section I) establishes replacement inventory. The initial inventory must be replenished from time to time as serviceable spares and repair parts are consumed. The replenishment process is called Secondary Item Procurement. The DoD spends about $6 billion each year to replenish its $20 billion inventory of spares and repair parts.

In addition to spares and repair parts, Secondary Items include: (1) all minor end items such as soap, bandages and hand tools; (2) bulk items used in repairing major equipments (e.g., sheet aluminum, welding rods, gasket material); and (3) other consumables such as food, fuel and clothing. The DoD inventory investment in these three kinds of items approximates $3 billion—and the annual budget for replenishing this inventory is about $5 billion.

A. Serviceable Pipeline Factors/Stock Levels

Central Issue.—Establish central issue facility to reduce stockage levels for common troop-use items, e.g., field clothing and equipment.

Funding.—Reduce, where feasible, production leadtime and review cycles so as to reduce invested funds. (Funds saved may be used to procure other approved requirements.)

MILSTRIP.—Implement MILSTRIP to reduce order and shipping levels.

Mobilization Requirement.—Screen to determine when an item is non-combat essential so as to eliminate protectable mobilization requirements thus reducing levels of supply and allowing mobilization assets to be used in lieu of initiating procurement.

Reutilization.—Return items excess to overseas theater requirements to CONUS to satisfy current backorders and other requirements where economically feasible.

Reorder Cycle.—Intensified management to reduce reorder cycle requirements was accomplished by liaison visits to overseas theater. Liaison personnel provided instructions and assisted in reducing the previously overstated reorder cycle requirements.

Safety Levels.—Review continually safety levels and Prepositioned War Reserve Stock (PWRS) criteria so as to refine and reduce safety levels or PWRS requirements and thus release available assets, thereby eliminating procurement action.

Stock Levels.—Reduce stock levels for high dollar value insurance items.

Stock Levels.—Reduce requisitioning objective by decreasing order and ship time, thereby reducing stock levels.

Shipping.—Ship supplies direct to requisitioner rather than via intermediate depot. (e.g., elimination of Okinawa as transshipment point to RVN.)

Shipping.—Review continually modes of transportation available so as to reduce transportation time and thus decrease the requirement for funds to finance in-transit inventories.

B. Maintenance, Failure and Removal Factors/Rates

Overhauls.—Increase time between overhauls where practicable and return resulting serviceable excess stock to depot.

Reparables.—Analyze items coded expendable so as to determine those that can be repaired economically—and code these reparables so as to decrease procurement cost.

Service Life.—Develop special analyses to extend useful service life of an item and thus eliminate high replacement rates. (One study revealed that superficial cracks in an item had no relation to the functional effectiveness of the item. New maintenance and inspection policies changed the practice of discarding the item because of the appearance.)

Shelf Life.—Extend shelf life where conidtions warrant (e.g., from 6½ years to 8½ years for replacement of gas generators in rocket motors of a missile system).

Usage Rate.—Review current usage rate prior to procurement to determine whether it indicates a downward trend, thus permitting the obligations of funds for a planned requirement to be reduced.

C. Echeloning of Stocks

Allowances.—Intensify coordination of allowances between commodity manager and overseas theater manager (e.g., such coordination resulted in a reduction in allowances on the M1 control for Honest John).

Consolidation.—Review range and depth of stock at each echelon of supply so as to reduce, through stock consolidation, the safety level investment or to eliminate echeloning of stock.

Emergency Stockage.—Review current requirements to determine which items are no longer required for emergency stockage of a project. (Items can be shipped to depot to meet other requirements.)

Operational Stocks.—Determine whether operational project stocks will continue to be required. If not, cancel applicable stock fund obligational authority so as to preclude new procurement.

Mission Essential Stocks.—Establish uniform policy computing mission essential stockage requirements so as to reduce requirements without impairing military readiness. (In one case, previous requirements had been determined by individual installations, resulting in wide variances in stockage levels.)

Organization.—Eliminate unnecessary echelons. (As a result of a special study a reorganization eliminated an Ordnance Battalion. This action resulted in the elimination of prescribed supply levels of the battalion. Assets on hand were used to satisfy other demands.)

Shop Supply.—Survey shop stockage at the field maintenance centers so as to eliminate unnecessary stocks without impairing efficiency of maintenance operations and without increasing the supply account workload.

D. Repair Cycle Factors

Average Quarterly Return.—Apply average quarterly return concept (increase in anticipated return of unserviceables) on supply control studies so as to reduce net requirements.

Engines.—Reduce engine overhaul requirements by extending or eliminating maximum time limitations, increasing base level capability to repair engines, increasing scale of authorized base level repair, improving engine life through modification programs, reducing foreign object damage, extending inspection intervals, reducing pipeline time through automatic resupply procedures, improving requirements computation methods, and improving transportation methods and criteria.

Failure rates.—Review frequency of failure of repairable items. (When the time between repair cycles is extended, the requirement for automatic replacement of secondary items is reduced.)

Unserviceables.—Intensify follow-up by item managers to users requesting turn-in of unserviceable items so as to reduce requirements by increasing the unserviceable return ratio.

E. Procurement Techniques

Adapt Commercial Item.—Fill requirement for special item by minor modification of a commercial off-the-shelf item where feasible.

Bulk Purchase.—Specify bulk in lieu of small package (e.g. distilled water purchased in bulk and issued in containers returned by the using units is less expensive than distilled water issued in five gallon plastic bottles.

Contract Terminations.—Make more effective/timely termination of contracts or cancellation of requisitions on the basis of reduced requirements forecasts.

Multi-year Procurement.—Utilize multi-year procurements where practicable.

F. Maintenance/Repair Techniques

Adaptability.—Determine whether function can be performed by using another item presently in the system. (Evaluation of a field maintenance tool kit resulted in the elimination of one component from the supply system.)

Cannibalize.—Cannibalize unserviceable units. (Condemned wheels and brakes were turned into reclamation and complete units were disposed of as scrap metal. The maintenance shop was furnished a save list of items required to overhaul and repair serviceable wheels and brakes. The items were removed from condemned units, serviced and turned into supply for reissue.

Cannibalize.—Cannibalize parts from excess or surplus equipment.

Cleaning and Test.—Develop cleaning and test techniques. (Cleaning and test instructions were developed to rework woven-wire mesh hydraulic filter elements in lieu of a condemnation rate of 100%.)

Component Replacement.—Remove and replace defective components in lieu of procuring total assemblies. (In one case, component parts were available from previous buy programs. Subsequent requisitions were for parts instead of complete assemblies.)

Contractors.—Encourage contractors to develop repair procedures. (Engine cylinders were being condemned during overhaul because of head erosion. A contractor acceptance repair procedure was developed which allowed the cylinder studdings to be reinstalled.)

Conversion.—Convert through rework and reidentification (e.g., excess VC-137 engine cowl panels reworked to the C-135B configuration.)

Expendables.—Study "expendables" for possible re-use (A study revealed that it was economically feasible to overhaul the mainshaft engine bearings for reuse. Before the management action the bearings were disposed of when removed for time limitation.)

Industry Practices.—Review industry advances in rework technology so as to accomplish repairs that preclude new procurement.

In-House Innovation.—Innovate reclamation techniques. (Engines being overhauled were previously discarded when crankshafts were worn beyond the .010 undersize. Under new practice crankshafts were reclaimed for commercial rebuild. Journals were ground to .020 undersize and chrome plated back to required size.)

In-Place Repair.—Develop technique for in-place repairs. (Repairing damaged and bonded honeycomb panels without removing them from the aircraft resulted in a reduced requirement. Previous to the management action, damaged panels were removed and replaced.)

Maintenance Float.—Decrease maintenance time and supply turn around so that maintenance float items can be returned to depot to meet other requirements.

Modification.—Develop modification of on-hand item to meet new requirement. (Crankcase assemblies were modified and restored to prime configuration. This resulted in increased returns of repairable assemblies.)

Multi-Purpose.—Reconfigure special items to meet multi-use purposes. (Special analysis resulted in changes in configuration of tool sets. New configuration resulted in authorization of only two tool sets per maintenance battalion whereas previously thirteen tools sets were authorized each battalion.)

Multi-Purpose.—Substitute multi-purpose item for special purpose item. (A special maintenance evaluation study resulted in a reduction in the number of grinding stone components in a Grinding Kit. This was achieved by substituting multi-purpose stones for those of limited usage.)

Nude Engine Concept.—Apply nude engine concept. (E.g., carburetor overhaul program was reduced as a direct result of the nude engine concept.)

On-Site Repair.—Develop on-site repair technique. (Turbine cases were being sent to the factory for repairs when they were received with gas erosion. Repair is now being made by building up eroded area with welding rod and machining back to specification.)

G. Miscellaneous Improvement and Savings Ideas

Back Orders.—Review back orders with requisitioners to cancel requisitions for supplies no longer needed.

Back Orders.—Review over-aged back orders. Often an old requirement has been satisfied by action of the customer which negates the procurement action required.

Banding.—Inspect used banding steel to determine whether it is in usable condition. Reclamation of this material is now a permanent depot activity.

Centralized Management.—Change the management of an item from decentralized (local purchase) to centralized or vice versa when economies would result without adverse effect on operations.

Clothing.—Retrieve discarded clothing. Previously discarded field jackets rendered unserviceable as a result of paint and grease are now

kept and used in any situation in which paint or grease are likely to come into contact with them.)

Consolidated Requirements Listing.--Review thoroughly the Item Summary Listing of mechanically computed requirements so as to effect a consolidation of Stock Numbers and substitution of like items. (This review should include requirements not recognized by the computer.)

Distilled Water.—Use distilled water generated as a by-product of the fabrication shop.

Dunnage.—Use inert materiel as serviceable base dunnage to reduce the lumber and supply requirement.

Film.—Test to determine whether outdated film and equipment are still usable.

Forecasting.—Improve the accuracy of requirements forecasts through better use of program change factors.

Foreign Sales.—Review major items sold through the Military Sales Program or provided through the Grant Aid Program so as to identify secondary items not required by the recipient country. These items could satisfy U.S. requirements and either defer or obviate procurement action.

Hi-Value Assemblies.—Validate suspected excess actions on customers requisitions for high priced assemblies in order to cancel requisitions for the excess quantities. (Savings are effected through reduced ICP stockage levels or forestalling a temporary unnecessary increase in the supply pipeline.)

Hi-Value Items.—Apply selective management principles to high dollar value items by increasing management attention to all of the elements considered in forecasting requirements (demand rates, additive requirements, lead times, etc.).

Lumber.—Reclaim lumber instead of buying new lumber when feasible.

Materials Handling.—Evaluate suitability of on-hand equipment to meet new requirement. (Special evaluation resulted in elimination of certain materials handling equipment. Determination was made that existing similar types were adequate, thus eliminating procurement requirements.)

Nonreported Excess.—Determine stock availability at other activities before initiating procurement. By screening other activities before procurement, non-reported excesses may be discovered which will benefit both activities involved and preclude procurement.

Packing.—Re-use shredded paper and reclaimed boxes received in incoming shipments as packing for supplies and equipment for troop issue.

Packing.—Use fiber board scrap. Use as dividers for cartons when economical.

Phase-outs.—Review the scheduled phase-out of major equipment. Awareness of the phase-out date of an item precludes the procurement of repair parts required to support this item past the required date.

Quantities.—Question the validity of quantities requisitioned if they appear excessive.

Redistribution.—Consider redistribution of assets in lieu of procurement. When long lead times or the excessive cost of an item would justify redistribution from an overseas activity, utilize this method in place of procurement.

Repair Parts.—Determine the minimum replacement of repair parts which will return an assembly or component to a Ready-For-Issue status. Updating of catalogs frequently reclassifies and adds repair parts to those items previously catagorized as non-repairable. By utilizing the new, less costly repair part, replacement costs may be reduced.

Salvage.—Adapt salvage to current needs. (Parachute bags declared for salvage were used as improvised containers in lieu of procurement of wooden boxes. This constituted a reutilization of containers and reduced procurement requirement for new containers.)

Standardize.—Standardize on lower cost item or replace several items with one item.

Subsistence.—Advance schedule for use of stocks approaching shelf-life limit. (Utilization of expiring reserve subsistence stock during exercise "Gold Fire" in lieu of force feeding "A" Ration in CONUS.)

Substitutions.—Substitute items with concurrence of requisitioner when the alternate items do not represent normal substitutions. The item substituted must be a lower priced item or available from excess, surplus, or long supply stocks.

Value Analysis.—Apply Value Analysis Materiel Procedures (VAMP). (These actions include locating warehouse assets, using substitute items, making substitute assemblies of stocked parts in lieu of procuring the assembled component, and locating assets lined under multiple Federal Stock Numbers.)

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III.

Manuals, Data and Reports

a. Determining Data Requirements
b. Acquisition of Technical Data
c. Receipt of Data
d. Utilization, Storage and Retrieval of Data

Manuals, Data and Reports

It has been estimated that the Department of Defense inventory of technical data consists of 50 to 80 million engineering drawings, a million bills-of-material, half a million pieces of administrative data, more than 35,000 specifications and 250,000 technical manuals. Each year the Department of Defense spends approximately $2 billion for technical data and increases its inventory of such data by 6 million pieces.

Many data management functions are prime targets for cost reduction and management improvement. Some objectives are: (1) further refine departmental authorized data lists and reduce the number of unique or peculiar data items now included in these lists; (2) intensify screening of data requirements during pre-contract award surveys; (3) make more widespread use of data prepared in the contractor's format instead of the military format; (4) establish data quality programs; (5) negotiate for "hi-dollar" items; (6) impose firm delivery schedules; (7) acquire adequate procurement data packages; (8) have qualified personnel inspect the data prior to government acceptance (9) standardize storage and retrieval procedures and equipment; (10) establish data disposal programs.

The DoD Data Management Program, now 5 years old, has made good progress. A new specification, MIL–D–1000, has improved the form and use of drawings. A deferred ordering concept has been developed and published in the Armed Services Procurment Regulation. A single Contract Data Requirements List is now being used by all Services and data pricing policies have been developed and implemented.

A DoD Authorized Data List will soon be published and data quality assurance will soon be upgraded. On the horizon looms computer technology for numerical control in data management.

A. Determining Data Requirements

A–1. Issuing the Data Call

Data Managers.—Initially always contact those responsible officials such as engineering, procurement, maintenance, operations, logistics support, etc., to identify justifiable technical data requirements for a pending procurement.

Functional Managers.—Identify specific data requirements based upon the intended use of the documentation and application of the weapon system, end item, equipment, material or service supported by the data.

Functional Managers.—Review the Authorized Data List (ADL) and select only those data items required for life cycle support of the operational requirement.

Functional Managers.—When a firm data requirement exists for which no data item is included in the ADL, prepare a data item description and the justification for procurement.

Functional Managers.—Provide specific guidance for establishing technical data requirements.

A–2. Designing the Requirement

Engineering Drawings.—Specify Form 2 or 3 drawings of MIL–D–1000 (drawings prepared to company practices) whenever possible.

———Permit use of multi-detail drawings unless monodetail drawings are required for specific reasons.

———Order control drawings rather than detailed drawings when details are not needed for procurement, maintenance or other functions, and control drawings are less costly.

———Minimize special drawing requirements, and use MIL–D–1000 and MIL–STD–100 without modification unless added requirements are essential.

———Avoid ordering "complete sets" of drawings, and determine the appropriate "intended use category" of MIL–D–1000 before ordering drawings.

———Place emphasis on high payoff areas, e.g., concentrate data inspection efforts on spare parts data because such data is used for repetitive procurement, cataloging, item entry control, etc.

———Defer the ordering or delivery of drawings until the need is economically determined.

———Apply economic criteria in judgments in purchasing drawings, e.g., drawings for parts that will not be reproduced or will be procured in small dollar quantities may not need the degree of detail or refinement needed for high dollar purchases.

———Consider life cycle requirements and needs for all functional areas. For example, drawings for spare parts require sufficient detail to permit a distinction to be made between items of supply. Avoiding purchase of a drawing simply because the procurement volume may not warrant competitive procurement may be false economy because it could result in assignment of a new stock number for an item that is identical to or interchangeable with an item already in supply.

———Leave drawings with contractors for as long as possible before requiring delivery to a government repository, to minimize handling and distribution of drawings that are subject to change.

Technical Manuals.—Use commercial production data when they meet military needs, rather than the stringent and more expensive military specifications.

———Use engineering drawings and other data already available rather than development of new illustrations.

———Precisely define skills of the user and prepare technical manuals accordingly so the development of training material can be avoided.

———Schedule delivery of final technical manuals so it will be unnecessary to prepare "bridge-the-gap-materials" to satisfy test, technical evaluation, and training requirements.

———Consider utilizing the services of technical writing specialists for more economical preparation of TMs.

Other Technical Data.—When appropriate, always utilize available in-house data.

———Where technologically and economically feasible, utilize in-house facilities and resources to prepare technical data.

———When technical data is procured from a contractor, always utilize his form, format and content unless stringent military requirements dictate otherwise.

Other Considerations.—The complete and adequate definition of the data requirements is an absolute necessity. An incomplete description of the data required is both time consuming to the contractor and costly to the government.

———Never require a higher degree of quality of the data than necessary.

———Where possible, have data content stated as simply as practical.

———Always specify relaxed formats where appropriate. Formal formats usually entail high production costs.

———Use standard sizes. Deviations from standard sizes contribute to higher costs.

———Keep data revisions to a minimum. Revisions resulting from poorly stated requirements trigger higher costs.

———Order adequate quantities of data to avoid double printing runs.

———Do not specify a higher quality of materials than needed.

———Avoid excessive drawings, pictures and illustrations. Do not require color when black and white will serve the purpose.

———Do not specify fancy bindings or expensive covers.

———Wherever possible, specify that data be delivered in microfilm form in lieu of hard copy.

———Specify realistic delivery schedules for the data. Short delivery deadlines increase costs.

———Properly identify for the contractor all the recipients and number of copies required for each data item.

———Always defer the delivery of data until it is required by the government.

A–3. Preparation of Consolidated Contract Data Requirements List (DD Form 1423)

Data Managers.—Prepare a definitive listing of data requirements submitted by functional managers.

Data Managers.—Review, screen and consolidate (based on consultations with functional managers) data requirements based on the relationship to the specific procurement.

A–4. Approval of Data Requirements

Review Board/Project Manager.—Final screening and approval of data requirements to be incorporated in the contract.

B. Acquiring Technical Data

B–1. Preparing the Contractual Document

Data Managers/Contracting Officers.—Prepare bid/offer clearly and accurately.

———Include technical data as separate line item (s) in the contract schedule.

———Provide the consolidated Contract Data Requirements List (DD Form 1423) for inclusion in the IFB or RFP.

———Insure that the RFP includes the requirement for the contractor to price out each data line item listed on DD Form 1423.

———Insert the "non-responsive" clause for technical data pricing in each RFP.

———Require all offerors to complete DD Form 633–2 (Cost/Price Analysis) for "hi-cost" data items contained on Form 1423, Contract Data Requirements List.

———Include acceptance procedures, responsible officials, place of acceptance and method of payment for data in the IFB or RFP.

———Include severe penalty clauses in the IFB or RFP for delivery of inadequate or late delivery of data, especially when procurement data packages are specified, in accordance with existing policies.

B–2. Evaluating the Contractor Proposal

Data Managers/Data Review Boards/Contracting Officers.—Review and evaluate offers for each major line item of data as follows:

———All data packages contained in offers estimated at $1,000,000 or more will be reviewed for essentiality by Data Review Boards.

———Data prices will be reviewed and a judgment made based on the engineering value of the data versus the price.

———Compare contractor price proposals with in-house estimates.

———Insure that contractor has complete understanding of data requirements.

B–3. Negotiating Data Prices

Data Managers/Contract Negotiators.—Check Price Group information in block 25 of DD Form 1423.

———Make analysis of the price according to the codings I, II, III and IV.

———Evaluate, based on the complexity of the data, preparation effort involved and whether or not the contractor had to prepare the data for his own use.

———From DD Form 633–2 determine the estimated number of units (e.g. text, drawings, foldouts, art, photo, computer printouts and other), their size and number of new and revised units. Question as appropriate.

———Check the number of labor manhours, by skill types, estimated by the contractor as being required to do the job.

———Know the preparation tasks involved, by skill types, for preparing the various kinds of data. Insure that high priced contractor personnel are not charged with the performance of menial tasks.

———Check any machine time expense associated with preparing the data. Insure that the number of units and manhours are appropriate for the proposed rates chargeable to keypunch operators, printers, computer rental and other types of equipment or people.

———Insure that travel and subsistence expenses are necessary and reasonable.

———Evaluate Material and Service expenses and delete high cost materials. Substitute adequate and cheaper replacements.

———Under reproduction expenses make certain that costs are not for unusual type faces, etc., and substitute or eliminate fancy covers, binding, packaging, etc.

———Question and eliminate any unwarranted charges for updating and revisions of the data.

———Ascertain whether or not the data preparation effort is being subcontracted out. Subcontracts let by the prime generally call for fixed hourly rates by skill types, subcontractor's overhead 20% to 30%, G&A 10% to 20% and Profit 5% to 10%.

———Insure that prime contractor's overhead, G&A and Profit and Fee (applied to Direct Charges listed above) are normal for the conditions prevailing in the pending procurement.

———Identify points of contact (Government) to resolve data questions after award of contract.

———Firm up delivery schedule of data.

———Make certain any and all exceptions to the data requirement, schedule, quality, degree of accuracy, quantities, etc., are understood.

———Insure that all data prices negotiated do not include any amounts for "Rights-in-Data." Acquisition of Data Rights is a separate consideration.

C. Receiving Data

Plant Representatives/Functional Managers/Users.—Make sure contractor has checked and made technical review of all data to be delivered under the contract.

———Review data to insure that it will meet its intended use.

———Question all restrictive legends and markings and insure (contact legal personnel) that they are justified prior to acceptance.

———Official signing DD Form 250 or other acceptance document will assure himself of the data adequacy prior to acceptance.

———Government "users" of the data will ascertain that the data is adequate. Required revisions or updates will be brought to the attention of responsible officials.

D. Utilization, Storage and Retrieval of Data

Users.—Once data is delivered, utilize it as intended.

———Avoid updating and revisions whenever possible.

———Process official changes expeditiously.

Storage and Retrieval Facilities.—Always standardize on microfilm processing and reading equipment.

———Eliminate duplicate files.

———Dispose of old data when need no longer exists.

———When conditions warrant, microfilm files of required data to eliminate bulky files and conserve storage space.

———Require justification of multi-copy issuances of data.

———Centrally locate retrieval equipment for maximum utilization.

——— Update files centrally on microfilm and distribute. This eliminates the requirement to update at each file location.

———Advertise the kinds and types of data available and how it may be obtained. This could prevent buying data already on hand.

———Develop standard engineering data storage and retrieval systems that will permit design engineers to search for parts by input item characteristics. This will:

1. Reduce design duplication
2. Reduce duplicate testing
3. Reduce engineering search time
4. Reduce new item growth
5. Reduce duplication of data
6. Simplify provisioning
7. Simplify data management

———Develop an index of data system activities and projects to aid in preventing the development of duplicate systems.

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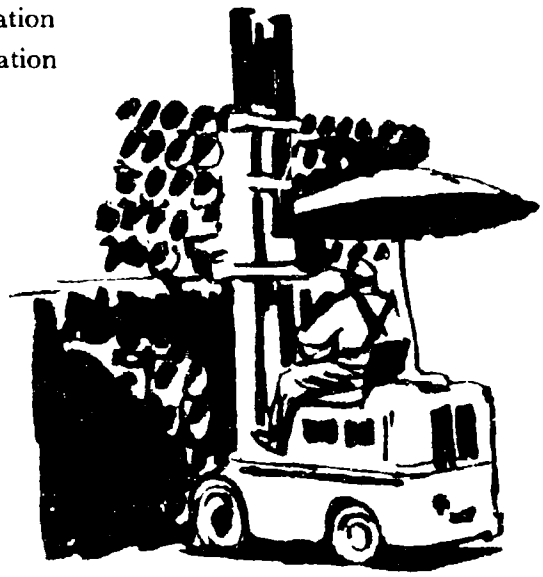
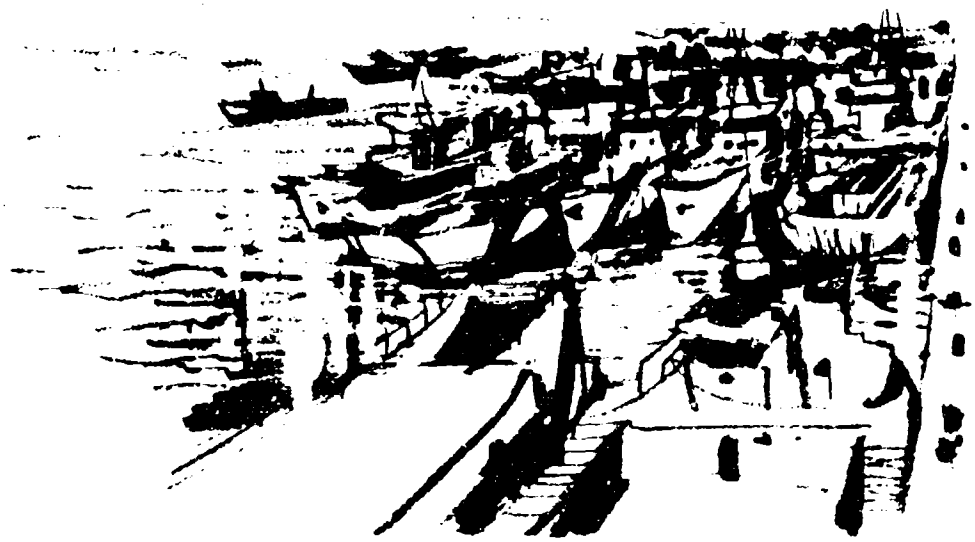
IV.

Reutilization of Long Supply, Excess and Surplus

a. Modify—Redesign
b. Interchange—Substitute
c. Interrogate Other Sources
d. Innovate New Uses
e. Use Contractor Excess Inventory
f. Apply Inter-Service Utilization
g. Apply Intra-Service Utilization
h. Review Excess Listings
i. Reclaim





Reutilization of Long Supply, Excess and Surplus

Large quantities of Defense-owned items no longer can be used in their present form for the purposes intended at the time of purchase. Current requirements do not exist for these items for one or more of the following reasons:

- Obsolescence
- New military strategies and tactics
- Sudden cessation of hostilities (as in the Korean action)
- Demobilization (as in WW–II)

Some of these items for which no current requirements exist are held in reserves for contingencies. Some are declared excess to all foreseeable Defense Department uses and are then screened into surplus for ultimate disposal by the General Services Administration.

Other Government agencies also have unneeded items in their inventories. So do contractors who have in their possession Government-owned property that is excess to the requirements of their current contracts or that is residual to terminated or completed Government contracts.

The objective of the Defense Reutilization Program is to preclude purchase of new items to satisfy current requirements by reusing items already on hand in long supply, excess or surplus.

However, the Cost Reduction Program does not credit every reutilization as a savings even though every reutilization that precludes new procurement actually is a money-saver. The Cost Reduction Program demands evidence of real ingenuity in effecting the reutilization—and this ingenuity can be demonstrated in only two ways:

- By modifying the excess item to fit the current requirement
- By adapting the excess item to a use other than the one for which it was intended when purchased

A. Modification/Redesign

A–1 Aircraft and Aircraft Components

Aircraft.—Modify obsolete aircraft for use as drones.

Engines.—Convert, modify or redesign excess aircraft for use on different types of aircraft (e.g. R2000–4A aircraft engines for use on CV–2 aircraft).

Carburetors.—Determine if excess carburetors designed for a different engine can be modified in lieu of more expensive repair of unserviceable carburetors.

Wheels.—Use nose wheels or landing wheels designed for a specific aircraft on other appropriate aircraft with change in landing gear assemblies.

A–2. Ammunition and Bombs

Artillery Ammunition.—Use excess rounds by adding a new fuze to meet a special requirement.

Ammo Boxes.—Modify obsolete ammunition boxes to transport and store other types of ammunition (e.g., M2 box in lieu of the new M250 ammunition box 7.62mm and 5.56mm).

Bombs.—Convert WWII bombs designed for use only with propeller driven aircraft for use with jet aircraft.

Cartridges.—Convert excess in lieu of procuring new rounds of ammunition (e.g., 57mm TP cartridges to 57mm HE).

Fin Assemblies.—Modify fin assemblies to meet requirements for training purposes (e.g., M6 to M3 for 81 MMTP and 81 MMHE).

A–3. Clothing and Equipment

Cloth.—Re-nap wool frieze cloth and use for lining items (such as flying jackets).

Clothing.—Modify clothing (such as arctic trouser liners) to meet needed size requirements.

Webbing.—Treat excess standard untreated webbing to meet requirements for mildew resistant webbing.

A–4. Missiles and Related Equipment

Missile Trailers.—Adapt to other uses (e.g., modify and strengthen excess trailers for use as flatbed cargo trailers).

R & D Equipment.—Modify to suit test and operational purposes (e.g., Titan II Telemetry Multiplexers configured for research and development purposes have been modified and used for operational test purposes).

A–5. Guns, Mortars & Howitzers

Guns.—Reconfigure to needed use (e.g., M–24mm guns can be modified to an M–3 configuration for use on A–1 aircraft).

A–6. Miscellaneous

Axle Assemblies.—Modify excess truck axle assemblies for appropriate interchange with other assemblies (e.g., axle assembly for 2½ ton gasoline powered truck can be modified and used on the 2½ ton multi-fuel engine truck.

Compressors.—Modify to needed use (e.g., GTC 85–15/16/34 compressors can be modified to satisfy requirements for the GTC 85–56 compressor).

Film.—Cut and re-spool photographic film that is near end of shelf life in order to fill need for shorter lengths and to shorten use-time.

M–1 Thickener (Incendiary Oil).—Convert to desired viscosity (e.g., M1 Thickener can be converted to an M2 Thickener).

Parachutes.—Modify parachutes excess to needs of one military service to meet the specific requirements of another military service,

Radio Sets.—Adapt to desired use (e.g., by changing the mount assembly, excess AN ARC radio sets can be substituted for AN ARC–55 radio sets).

Railroad Cars.—Use excess tank cars for bull storage of gasoline and fuels in lieu of bulk storage space.

———Modify foreign service-type boxcars and use for shipment of ammunition.

B. Interchange or substitute

B–1. Aircraft

———Replace older aircraft with newer excess (e.g., C118 aircraft have been used to replace older C54 aircraft).

B–2. Clothing

———Fill one service's clothing needs with another's excess (e.g., Navy-style windbreakers have been substituted for similar Air Force items).

———Adapt excess clothing to new use (e.g., Navy utility shirts have been used as replacement for tropical combat coats).

B–3. Miscellaneous

Steel Sheeting.

———Substitute excess larger size for smaller size (e.g., 6′X8′ excess steel sheeting has been used as a substitute for 4′X8′).

C. Special Interrogation

Military Services very often make material available to other Services. Never assume that because a review of excess listings did not locate material that procurement is the obvious next step. Interrogation between bases can and does save millions of dollars annually.

C–1. Engines

Crankcases.—Interrogation often reveals sources of reparable items that can be repaired at moderate cost thereby precluding a new procurement. In one example, one Service obtained 64 reparable engine crankcases from which 62 crankcases were repaired to like-new condition at considerable savings over new procurement costs.

Oil Cooler Tubes.—A demand for a large quantity of oil cooler tubes was filled when interrogation revealed that another Service had 5,000,000 surplus tubes which could be used to meet the requirement.

Target Engines.—Within the same Service, the Missile Command had a requirement for target engines. Through special interrogation engines were located at the Materiel Command which could be used after slight modification.

C–2. Miscellaneous

Radar Equipment.—In a recent example, interrogation of a foreign Air Force source (Military Assistance country) revealed presence of a quantity of excess radar equipment spares that were made available without cost.

Furniture.—Phone or visit nearby bases to ascertain availability of excess furniture items to meet urgent or immediate requirements.

Mailboxes.—Mailbox requirements for military bases can often be met by interrogation of various U. S. Post Offices.

D. Using Material for Other Than Intended Purposes

Technical personnel can exercise initiative and ingenuity to uncover opportunities for savings by finding new uses for excess and surplus items. Employees should be informed of requirements and encouraged to develop new uses for available excess.

D–1. Aircraft and Aircraft Engines

Jet Engines.—Excess jet engines can be used to propel test sleds for testing arresting gear systems.

———Jet engines have been used in a jet-end forward position to clear snow and ice from test tracks.

D–2. Missiles and Equipment

Missiles.—Obsolete missiles can fill requirements for high altitude supersonic target drones.

Rocket Motors.—Surplus Rocket Motors are being used as propulsion for high speed test sleds.

D–3. Vehicles and Related Equipment

———Excess special purpose vehicles such as electronic trailers and vans can be used for various trailer van or truck purposes by removing the special purpose components.

———Canvas cargo-body covers have been used for outside storage protection.

D–4. Explosives

Composition "B".—Composition "B" can be pelletized, remelted and used in loading mines and for similar purposes.

D–5. Radios, Radar & Communication Equipment

Radar Sets.—Radar Set Groups obtained from another Service were used on contracts for controlled experiments in high frequency communications.

Radio Components.—Amplifiers and oscillators obtained from excess receiver transmitters of AN/ARC–27 Radio Sets can be used in support of the AN/ARC–55 Radio.

Generators.—Single excess generators of a higher capacity (e.g., 5,000 KVA, three phase transformer) can be used to meet a requirement for several smaller generators (e.g., 3 each 800 KVA, single phase transformer.)

D–6. Miscellaneous

Landing Mats.—Use excess landing mats to build ramps and temporary roads.

Flexowriter cards.—Available excesses of certain size cards can be used in lieu of 5"X8" cards or can be used in lieu of 5"X11" cards.

Canvas.—Obtain needed canvas for protection of storage areas and for other uses by stripping from excess items such as inflatable life rafts, excess tents, etc.

E. Use of Contractor Excess Inventory

A review of excess inventory upon completion of contracts may reveal equipment and material that can be transferred to other contracts or placed in regular supply stocks. Uncompleted items remaining at the end of a contract may be obtained, completed and used. Visits by qualified technical personnel to review available excess property can produce excellent results, particularly when the visitors are able to translate contract part numbers into Federal Stock Numbers.

E–1. Equipment

Missile Track Antenna Receivers.—Excess trailer mounted, target track, and missile track antenna receivers have been obtained for use on soft bomb training ranges.

Computers.—Computers of various types and capacities can be obtained as excess contractor inventory and used in guidance system studies, research projects and for other uses.

Radar Equipment.—Excess radar equipment can be modified and provided to contractors to meet specific needs such as for use in research in the field of atmosphere electricity and other related studies.

E–2. Material

Steel.—Bar and sheet steel stock and other metals are often available as excess from arms plants and other industrial activities that are closing out or completing production contracts.

Fabrics.—Excess quantities of cotton duck, nylon, wool and other fabrics left over from contract completions can be picked up for transfer to other contracts or used at the military clothing factories, (e.g., excess fabric used in making raincoats has been used for making liners for field coats).

F. Interservice Utilization

Inventory managers may obtain large amounts of needed equipment from other Services by submitting their requirements to the PLUS program, by review of excess listings, by interrogations, and by on-site screening of excess stocks.

F–1. Miscellaneous

Ammunition.—Substantial savings in procurement funds have been realized through obtaining excess ammunition from other Services. Ammunition has included 2.75" rockets, 40 mm cartridges, .30 caliber training rounds.

Missile Support Equipment.—Excess missile programmers and several data recorders have been obtained from the Air Force and used as Government Furnished Material on a Navy contract.

Radar Equipment.—Navy has obtained several items of Air Force radar equipment for use on test programs.

Idle Production Equipment.—Many pieces of equipment at the Defense Industrial Production Equipment Center can be obtained for various requirements.

G. Intra-Service Utilization

Inventory managers may obtain needed equipment and material from within their own Service by reviewing excess listings, conducting base-to-base interrogations, and by on-site screening of excess stocks.

G–1. Miscellaneous

Major End Items.—Major end items such as trucks, aircraft and engines no longer suitable for service can often be used as training aids in mechanics classes, for technician training and other student training programs.

———Patrol and Harbor craft stricken from Service vessel registers and scheduled for disposal can be recovered and used for training of Officer Candidates, ROTC and other associated training programs.

Other.—Review items scheduled for disposal because of expiration of shelf-life and conduct tests to see if item can still be used, or to determine if shelf-life period should be revised.

———Re-check items that may have been listed for disposition because of too strict serviceability criteria to determine if tolerances can be made less restrictive, or if the item can be used for another purpose such as training.

H. Review of Excess Listings

H–1. GSA Lists

General Services Administration listings often reveal availability of material that is needed within DoD. A review of DLSC catalogs and excess listings may preclude the procurement of a new item, or locate a more modern piece. Examples of items obtainable from GSA or DLSC lists are as follows:

———Wire rope

———Flatbed trailers

———Telephone Cable

———Hydraulic presses

———Connectors and relays

———Tubes and Transformers

———Desks and O[illegible]iture

———Refrigerator

———Fork lift trucks and other MHE

———Flexowriters and Auxiliary Equipment

H–2. Examples of Items Obtainable From DLSC Lists

———Ship propellers

———Paper

I. Reclamation

Major end items, e.g., ships, aircraft and other complex equipment, scheduled for disposition are good sources of supply. For example, generators, radio components, radar equipment, copper wiring, tubing, etc., can be removed and used to satisfy other valid requirements. Research and Development activities have obtained complete systems which are being phased out as excess. These systems were invaluable as sources of assemblies, components and complete units which were used either for their original use (e.g. oscilloscopes) or included in new systems needed by the R&D activity.

I–1. Vehicle Parts

———Before turning in vehicles for disposition *remove* and *exchange* serviceable tires, batteries, generators, etc., for similar items of lesser quality.

I–2. Aircraft Engines

———Remove components needed for assembly of quick engine change kits.

I–3. Weapons

———Many items such as machine guns have a number of common parts even though the weapon is used by another Service and has a different model number. Qualified technicians may be able to obtain repair parts needed to meet urgent requirements by identifying comparable weapons in excess stocks and removing parts required.

I–4. Miscellaneous

———Parts needed in rebuilding or fabricating items can often be found on surplus items. (e.g., a large quantity of quick release pins was needed in connection with the rebuilding of generator trailers. The requirement was satisfied by locating suitable quick release pins from special weapons handling devices turned in for disposal).

Reutilization of Long Supply, Excess and Surplus

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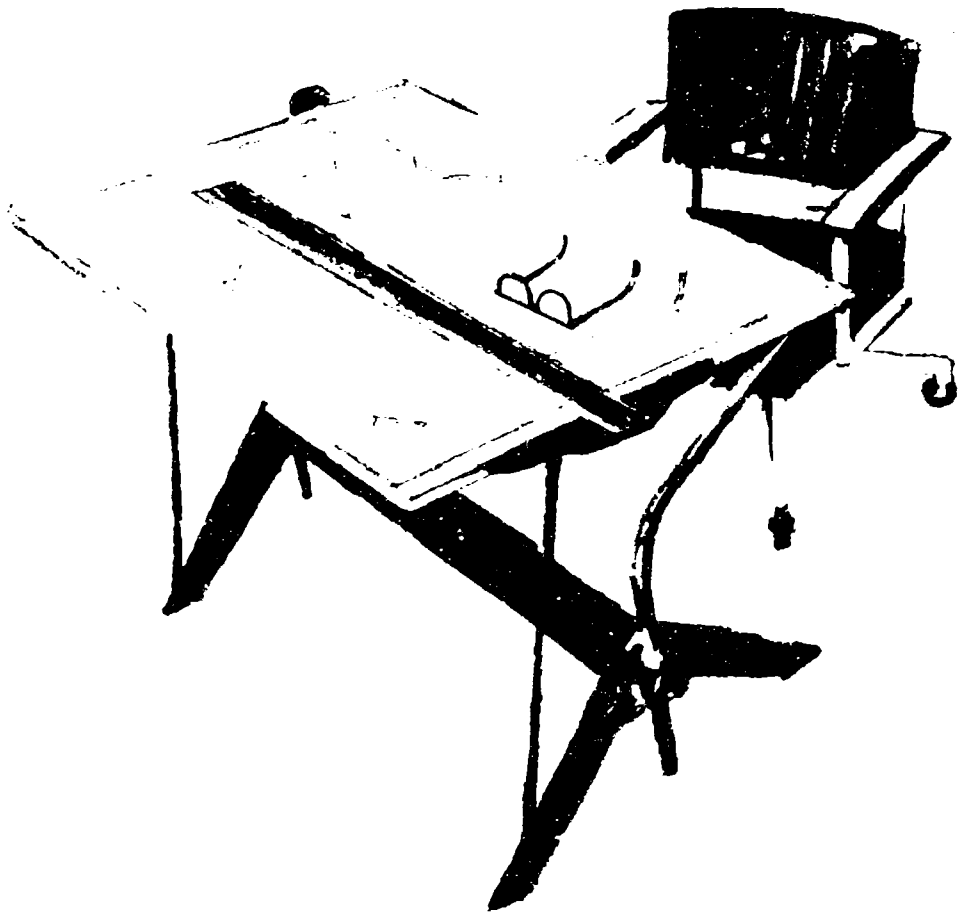
V.

Value Engineering

a. Apply Advances in Technology
b. Consider Changes in Users' Needs
c. Question all Related Specifications
d. Examine Design Deficiencies
e. Locate and Review High Cost Areas
f. Analyze Feedback from Test/Use



Value Engineering

Value engineering (VE), value analysis (VA) and value improvement (VI) are terms frequently used to describe an orderly discipline for reducing cost while maintaining needed quality and performance. The "value" technique can be applied to defense systems, equipment, procedures, facilities and material. For some time VE has also been referred to as "eliminating goldplating" in cost reduction parlance. The terms vary depending on the phase of the life cycle during which the technique is applied; e.g., VE when in the development stage, VA in production, etc. The DoD uses the term VE regardless of phase.

The VE technique first calls for a clear and simple definition of the function or purpose for which the product or output exists. The existence of the function is challenged and if necessary, its cost is determined and possible alternate ways to perform it are explored and priced. If an alternate way can accomplish the needed function at a lower cost, a change action is proposed. The value engineer or study team cannot order a change but only recommends it to the manager authorized to make the acceptance decision.

DoD experience shows that value engineering, properly applied, successfully reduces costs and frequently provides added benefits to military worth in improved quality, reliability, producibility and performance.

Despite significant progress in achieving cost savings via value engineering, a very large untapped potential remains to be exploited—both in-house and with Defense contractors.

A. Apply Advances in Technology

New Materials.—Consult with material specialists to find possible ways of improving design value.

Examples:

Condensate Piping.—The substitution of reinforced fiberglass epoxy pipe for cast iron, and the introduction of a new condensate injection device eliminated the need for a third high pressure condensate return line.

Deck Repair.—Leaks and corrosion were controlled on submarine decks by applying a seamless polyurethane coating in lieu of replacement and remolding of steel plates.

Fire Extinguisher Hose.—The life expectancy of fire extinguisher hose assemblies was extended to 8 years by adding a new protective coating material.

Fuze Material.—A special process aluminum replaced titanium for components of a fuze.

Missile Cover.—A fiberglass cover was replaced with a cover made from aluminum.

Storage Container.—A storage container for bomblet dispensers was redesigned and made from polystyrene instead of steel resulting in lower cost per unit and a 280 lb. reduction in shipping weight.

New Processes or Techniques.—Review systems flow, producibility aspects, etc. for improvement in the light of newer proved methods, processes and procedures.

Examples:

Electronic Chassis.—Using an electronic read-out machine instead of the height gage and surface plate method reduced the costs of inspecting is the dimensions of missile system modular chassis parts.

Gun Seal.—A simplified design of a seal groove for a high pressure seal in a gun tube reduced machine time and eliminated associated parts.

Gun Tubes.—An improved chrome plating and pre-plating procedure (thermal treatment process) for one of the gun tube components improved the quality of the component and saved 20 to 32 hours labor per gun tube.

Mess Knife.—A new stamping process produced field mess knives in a one-piece stainless steel unit, replacing the old mess knife with the stainless steel blade and cast aluminum handle.

Missile Test Set.—Incorporating an automatic programming feature in a controller test set eliminated the need for a second set and reduced testing labor hours.

Printed Circuit Boards.—A process for protecting copper in printed circuit boards was changed from gold electroplating to an effective low cost chemical dip.

Wing Design.—An aluminum slab type wing was found to withstand the required aerodynamic thermal and load conditions imposed at supersonic speeds, and was used in lieu of wings fabricated of a costly steel alloy.

New Components and Items.—Survey new products in the applicable field to lower fabrication and logistic support costs for spares, maintenance, training, etc.

Examples:

Building Panels.—Panels of a standard precut size replaced panels for metal joiner bulkheads formerly fabricated at the job site.

Missile Pressure.—A lower cost pressure switch met all test requirements and was substituted for the one originally specified for installation on large missile motors.

Radio Set.—The dynamotor power supply unit for a radio set was redesigned from a bulky mechanical type to a new solid state power supply unit.

Radio Set.—A transportable communications set was redesigned to permit use of less expensive solid state devices instead of vacuum tubes for providing required frequency output.

Rifle Spring Guide.—The action spring guide assembly in a field rifle was replaced by a suitable lower cost buffer assembly which also improved the functioning of the rifle.

B. Consider Changes in User's Needs

Redefinition of Mission or Function.—Assure that original design requirements are not outdated by change of mission which the product function supports.

Examples:

POL Storage Tank.—A study of specific petroleum storage requirements revealed that a 10,000 barrel storage tank, programmed and funded, was no longer needed and could therefore be deleted as a requirement.

Observer's Flight Control Kit.—Changed mission and configuration requirements for Fixed-Wing Observation Aircraft precluded the use of separate observers. The provision of a separate flight control kit for the observer stationed with each aircraft was discontinued.

Satellite Control Facility.—When a comprehensive review of existing and planned improvements in the satellite tracking system revealed the presence of an alternate and effective means of tracking future satellites, a planned modification to provide an additional radio beam for tracking purposes was eliminated.

Actual Use Differs From Original Intended Use.—Look for an item or piece of equipment being used for an unintended purpose which could be performed by a different lower cost item.

Examples:

Bomb Lugs.—A study of loading procedures for low drag bombs showed that the separate hoisting lug packed with each bomb was never used. The lugs were eliminated from future procurements.

Engine Fuel Heaters.—Heaters had been installed on each of eight engines of a bomber aircraft to prevent formation of ice crystals in the fuel system. When analysis showed that the heaters were unnecessary because of anti-icing additives in the fuel, the heaters were removed, thus eliminating overhaul and new procurement costs.

Hot Water Heater.—The coal burning capability of multi-fuel hot water heaters was eliminated from units procured for SEA when analysis revealed that coal was not an item of supply in that area.

Plug Retaining Clip.—Elimination of the retaining clip was authorized when a study revealed that the clip was never used in the field.

C. Question All Related Specifications

Overspecification.—Review design or performance requirements thoroughly with the customer to assure that his *actual needs* are not exceeded.

Examples:

Air Blowers.—Specifications requiring installation of four main forced draft blowers complete with electric motors, fluid drives and controls were revised when less costly blowers with variable inlet valves and controls were substituted.

Aircraft Engines.—A simple slip joint was designed for attaching the engine's air bleed duct and oil generator cooling duct, thus eliminating costly castings and flanges specified in the original design.

Air-Mobile Shelter.—Several non-essential features of the air-transportable aircraft maintenance shelter were eliminated and other parts were redesigned to reduce material and manufacturing costs.

Cot Covers.—A study showed that a single loop at each end of a canvas cot cover was sufficient to adjust for fabric sag or stretch just as well as the double loop specified in the original design.

Data Processing Equipment.—The contract price for analysis of test and flight data was reduced when a further look during contract performance disclosed that an available, less expensive to operate computer could replace the installed computer system at the contractor's data processing laboratory.

Flare Packages.—A study revealed that aircraft parachute flares could be procured in hermetically sealed containers at a lower cost than separate packaging methods currently in use.

Missile Electronics Network.—A study of existing flight control characteristics of a missile established that the same characteristics were applicable to another missile used in the system. The commonality of characteristics permitted elimination of two servo cross-feed networks.

Multiple Pin Connectors.—Connectors used in radio receivers were found to have several unused contacts. Specifications were changed to eliminate the unnecessary contacts.

Power Supply Cover.—A separate protective cover used to provide physical and weather protection to a small engine driven generator was eliminated when analysis showed that the metal cover of the generator provided ample protection.

Towing Tractors.—The specifications for aircraft towing tractors were found to contain more features than actually required. Special no-spin differentials, gas-fired heaters, and winches were eliminated.

Tropical Combat Coat.—A VE study of the combat coat resulted in elimination of one of two pencil pockets from one of the breast pockets, fastening the size label as part of the undercollar and stitching all four sides, and making the collar from a single piece of fabric in lieu of several separate pieces.

Appropriateness of Specification Elements.—Assure that each element of a specification is *needed* to support the design or performance requirement.

Examples:

Aircraft Radome.—Opaque nose radomes for certain aircraft were eliminated when it was discovered that the use of a radar absorption material on the aircraft's forward bulkhead served the same purpose.

Anti-Ballistic Missile System.—A reduction of $100 per 1,000 feet of wire was realized by substituting a single colored ground wire in the digital subsystem in lieu of the four striped color-coded ground wire originally specified.

Building Design.—Specification for prefabricated buildings called for a shed-type roof. A change in roof configuration permitted bids on commercially available buildings.

Electric Cable.—Material specifications for lighting cable were changed to modify insulation requirements and delete unrequired rodent and insect cable sheating.

Electrical System Controls.—A new design concept, utilizing direct electric busways and some manual operations, greatly simplified the overall electrical system, resulting in easier operation and reduced maintenance costs.

Folding Canvas Cot.—A substantial savings in both cost and weight was gained by substituting aluminum legs, ends and side rails, and a nylon cover for the cured hardwood, and canvas duck cover formerly used.

Helicopter Windshields.—A change in specifications for the helicopter was made to stipulate "replaceable" windshields in lieu of "interchangeable" windshields. This change eliminated the need for close tolerance tooling and lowered manufacturing costs.

Housing Design.—Several architectural changes were made to the specifications for a community housing project. These changes included a simplified roof framing and drainage system, elimination of interior

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Housing Design.—Several architectural changes were made to the specifications for a community housing project. These changes included a simplified roof framing and drainage system, elimination of interior

fencing, reduction in water supply and waste piping, and the substitution of asbestos cement pipe for cast iron pipe used for underground water distribution.

Landing Gear.—The original specifications called for the main landing gear structure in a fighter aircraft to be made of steel. It was determined that weight could be reduced and certain ground tests eliminated and material costs reduced by using aluminum instead of steel.

Multimeter.—A team study determined that the technical specifications on the digital multimeter used to measure voltage and resistance in tests on fighter aircraft could be relaxed without degrading effectiveness. This change cleared the way fo ruse of a less costly replacement multimeter.

Pallets.—A large priority requirement for four-way hardwood flat pallets was modified, with concurrence of the customer, to two-way softwood pallets.

Receiver-Transmitter Chassis.—Changed specifications from sand cast chassis to aluminum dri-cast chassis for two types of radio receiver-transmitters.

Sleeping Bags.—Specifications for the military cold weather sleeping bag called for the use of a blend of 60 percent waterfowl feathers and 40 percent waterfowl down to achieve the required degree of insulation. Adoption of a "filling power formula" retained the essential performance characteristics but made it possible to use less of the expensive "down".

Staircase Tile.—Domestic ceramic tile was substituted for Italian mosaic tile specified for a new dormitory building.

Surgical Drapes.—The basic fabric used in manufacture of sterile surgical garments was costly and not readily available for large quantity orders. Several alternate materials were reviewed and a less expensive fabric was found to meet essential specifications.

Acceptance Inspection and Test Requirements.—List all specified items and compare all similar requirements to eliminate overlap, unnecessary requirements, and combine items which can be performed with a single test or operations.

Examples:

Aircraft Cockpit.—A contractor proposed deletion of a portion of the testing required on fighter aircraft cockpit capsules. Deleting the test did not sacrifice safety, performance or maintainability requirements.

Contact Support Set.—Analysis of the programmed requirement for the contact support set of a tank missile system showed that the value to be

derived from this test feature was negligible and did not justify the planned expenditure. Development of the item was canceled.

Electronic Tester.—A tester used to check the continuity of the electrical system of a missile round was eliminated when it was discovered that adequate test equipment was already available in a check-out tool kit.

Field Gun Components.—Major thread forms on the couplings, chambers and tubes of guns were produced by thread milling and grinding operations in order to meet the specified surface finish requirements. The tool-work requirement was eased permitting elimination of the grinding operation.

Fuel Tanks.—The weld acceptance criteria for external fuel tanks for aircraft were modified without reducing reliability.

Gun Components.—A proof sampling plan was developed and implemented to replace the 100 percent proof requirements for contractor-supplied small calibre gun flash suppressors. The revised quality assurance plan resulted in extension of the proof sampling technique on other gun components such as large calibre gun tubes.

Missile Test Procedures.—Methods, procedures and test data from the laboratory responsible for the Minuteman propulsion system certification were subjected to a VE study. Results indicated that contractor performance of a similar test for comparative analysis was an unnecessary and duplicative test effort.

Rocket Motor Tests.—Testing requirements for rocket booster motors were reviewed and revised. The preproduction test units were increased from four to six, allowing production test units to be decreased from 20 to 10 in each 300 unit lot while still retaining adequate assurance of quality.

Supporting Documentation Needs.—Challenge stated details of need for safety manuals, maintenance instructions, training plans, procedures, and processes and buy only what is to be effectively used.

Examples:

Drawings.—A new-type drawing, called system functional diagrams, which affect a consolidation of the information previously published in three different sets of drawings, was proposed and accepted.

Helicopter Engine.—Cost reductions on the manufacture of turbine engines resulted from elimination of unnecessary precedures. Spot welding operations were reduced, assembly was simplified, and inspection procedures were improved.

D. Examine Design Deficiencies

Excessive Failure Rate.—Perform periodic analyses of failure rates with reliability, quality control or production improvement specialists.

Examples:

Gun Drum Assembly.—The drum assembly required excessive replacement of parts due to damaged chambers. After cost analysis, the chambers were reamed to remove pits, rust and other damage. Savings were realized through reduction in the procurement of new parts.

Launching Device.—An aircraft hold back assembly required replacement after two launches from the carrier deck because of excessively high temperatures and extreme jet velocities. VE analysis and testing resulted in a design change incorporating a heat resisting (NOMEX) sleeve to protect the wire rope, thereby increasing the service life from two to 12 launches.

Radio Set Blowers.—Failure of cooling blowers to operate efficiently caused malfunction of radio sets. Study showed that the same cooling effect expected of the blower could be accomplished by running air ducts from the case blower. Modification kits were installed and replacement of centrifugal blowers was discontinued.

Inadequate Performance.—Subject to design review those areas indicating less than satisfactory operation because of high parts consumption or maintenance skill usage.

Examples:

Aircraft Generator Shaft.—The output splines attached to the generator shaft on large aircraft were being replaced due to slippage to the clutch which led to shaft failures. Use of an improved shaft eliminated the problem, and a large purchase of costly splines was cancelled.

Jet Engine Fuel Control.—Excessive engine starting temperatures due to too much fuel caused the manufacturer of the aircraft engine to submit a proposal to replace the main fuel control. Study of the problem revealed that recalibration of the main fuel control eliminated the "hot start" difficulty, thus avoiding replacement of the fuel control units.

Missile Site Radio Communication System.—Due to a history of malfunctions, an existing radio system was to be replaced through the purchase of new sets. It was determined that the antennae, which rose from their hardened sites in the ground, were responsible for the malfunc-

tions. The antennae were overhauled and the purchase of new sets canceled.

Radar Hydraulic Actuators.—Actuators were being condemned due to worn bearing raceways which failed to meet prescribed dimensional tolerances. Through the use of oversized bearings in the raceways, actuators previously condemned were made serviceable, thereby obviating cost of procurement of new units.

Target Service.—Drone target service was costly because of the high loss rate of targets. Operating costs were reduced through the installation of a redundant recovery control system.

Safety.—Study safety incidents for preventive design so that personnel safety is assured and material loss is reduced.

Example:

Flare Dispenser.—A flare dispenser was designed in such a way that spring ejection created a safety hazard and the drag-producing configuration of the dispenser reduced aircraft capability. A review resulted in development of a low cost gas ejection system which eliminated the safety hazard. The improved ejection system also permitted streamlining of the dispenser, thereby reducing the drag-producing problem.

Producibility Problems.—Review fabrication processes to spot costly time or materiel waste and to permit use of alternate lower cost methods, designs or material.

Examples:

Ammunition.—Large caliber rounds were being rejected due to cracks in the shell casings. A method of heat cycling was divised and used to reclaim over 60 percent of the defective shells.

Men's Drawers.—Substitution of a rectangular panel in place of a curved panel seat has increased cutting yield and simplified the sewing operation with resultant savings.

Missile Circuit Boards.—The contractor was experiencing a low yield on the multilayer circuit boards due to excessive etching. A change in types of acid used for etching was made. After tests, chemical adjustments, revised masking procedures and other improvements, the yield was increased from 40 percent to 90 percent.

Rocket Launcher Assemblies.—Evaluation of the rocket launcher tube assemblies used in a helicopter weapons system resulted in replacement of the original tube assembly by a more maintainable, accurate and reliable assembly. The changes permitted competitive procurement of the assemblies at a large price reduction.

Torpedo Repair.—Abnormally high scrap rates were being experienced for the elastomeric "window" and the stainless steel assembly rings of torpedo transducers. While anechoic test requirements could not be relaxed, the mosmetic standards cited on the drawings were relaxed and repair procedures utilizing an epoxy adhesive filler were developed.

E. Locate and Review High Cost Areas Through Per/Cost Analysis

Sub-System Cost.—Pinpoint and select items constituting major cost in subsystems for VE review. Use of PERT cost data and work breakdown structure can assist to point out high dollar cost areas.

Examples:

Aircraft Fuselage.—The manufacturer of the fighter aircraft recommended standardization of hole sizes in the aft fuselage section and the redesign of fairings to permit electromagnaflux machine forming.

Armor.—Design specifications called for an aluminum two course steel armor configuration, which was the principal cost element in the guidance package. A cost review resulted in a change to a steel trigger bar and XAR30 armor plating system.

Missile Radar Component.—A change in the transistor housing environmental conditions, which prevented condensation, eliminated the need for costly hermetic seal requirements in the radar system and reduced the unit cost.

Radio Control Units.—Response to request for prices from a sole source for replacing eight radio control units shipped to SEA resulted in a higher unit price. Eight other type control units in stock were modified to meet the requirement at significantly less cost.

Radio Set Assemblies.—By changes in the drive assemblies, elimination of a coaxial cable, shortening of cable lengths and simpler construction features for housing and cover, a contractor for a radio set still delivered required receiver stability and provided increased equipment reliability, easier maintenance and simpler and faster tuning.

Sentinel Command.—The basic coolant system concept and design for a transmitter was changed from a separate coolant system for each group of transmitter tubes to a system that supplied all groups in parallel from a single pumping source. Savings were realized in conversion from one configuration to the other, with corresponding reduced installation costs.

Component Parts Cost.—Identify and select major cost targets for VE review among component parts, especially if potential for production and follow-on support involves substantial quantities.

Examples:

Air Compressors.—A commercial air compressor was substituted for the more expensive liquid cooled air compressor originally specified for a truck. Unit savings of more than 60 percent were realized.

Aircraft Cowling.—Original design requirements specified the use of a corrosion resistant material for the cowl tracks. The parts were redesigned to use a less costly material to meet specification needs at a reduced price.

Bearing Strips for Field Guns.—Sand cast aluminum bronze bearing strips were replaced by lower cost extruded aluminum bearing strips resulting in a 100 percent reduction in cost.

Ground Radio Control Set.—Elimination of flush wiring of rotor boards and substitutions of standard printed wiring boards permitted the ground radio control set to be manufactured at a decreased cost.

Missile System Components.—An engineering study revealed that the holder material in a vacuum chamber of film core arrays could be changed from high cost stainless steel to graphite.

Multiplexer Sets.—The substitution of less costly capacitors for the etched-foil tantalum capacitors used in several types of multiplexer sets resulted in significant savings.

Rifle Case.—The canvas case used to protect rifles in tactical vehicles was no longer needed when the bracket mount was moved to a different location. In moving the mount, it was found that a much simpler mount could be used.

Rifle Sling.—Redesign of the carbine rifle sling by eliminating high cost parts and simplifying the manufacturing processes reduced the unit cost by 20 percent.

Process and Item Cost.—Carefully review high cost processes and volume production items with view towards simplification.

Examples:

Asphaltic Penetratine Soil Binder.—A value review indicated that the procurement document for asphaltic soil binder specified a patented trade name brand. By changing the requirement to a generic identification and detailing the needed physical properties of the binder, a saving of $1.8 million was realized.

Combat Boots.—In the old style combat boot a leather heel cushion was required to provide a cushion over rough areas caused by sole and heel fasteners. The specifications for the new type boots of direct molded one-piece sole and heel construction also called for the leather cushion pad. Investigation revealed that the pad was no longer necessary because heel and sole fasteners are not used and boots are constructed with a smooth, comfortable, inner heel surface. Unit savings of only 5 cents resulted in many thousands of dollars saved on large production quantities.

Computer Boards.—The computer's weapon release chassis held two terminal boards containing about 200 components connected by 686 wires. A study led to a multiple layer printed wiring board development which replaced all of the costly interconnecting wires with internal conductor paths and allowed all component soldering to be performed with a one-wave soldering operation.

Frozen Food Cabinet.—The expensive stainless steel liner and outer shell was replaced by a less costly baked enamel outer shell and a porcelain enamel inner shell.

Grenade Launcher Housing.—A large price reduction was realized when the grenade launcher housing on a tank was redesigned by incorporating integral mounting support and minimizing machine requirements.

Gun Tubes.—Increased tolerances for large gun tubes permitted use of carbide cutters. This significantly reduced the number of passes and increased the rate of feed. Labor reduction per tube represented a unit savings of $95.90.

Helicopter Components.—Design simplification of several of the aircraft's components permitted use of less costly forms (castings instead of machine parts), allowed substitution of less costly materials and assembly items, and reduced manufacturing costs.

Image Intensifier.—A technical review of the relative merits of the specified functional grade of the tubes used in an image intensifier assembly vs. the resultant cost of the manufacturing yield, led to the establishment of more relaxed grading parameters, thereby increasing the tube yield by a significant amount.

Missile Bulkheads.—Bulkheads were changed from a rough die forging, requiring extensive close tolerance machining, to a lower cost semi-precision forging needing far less machining.

Straight Chair.—Modification to chair construction to provide a molded plastic seat with chair leg inserts, in lieu of a completely assembled chair with a fabricated wooden seat, permitted the chairs to be shipped unassembled. Four chairs are now shipped in the same cube as was required for two of the old-style chairs.

Logistic Support Cost.—Review any process or item calling for expensive maintenance and support to find ways of cutting support costs through design improvement.

Examples:

Airfield Matting.—A study of the concept of palletizing airfield matting for shipment, resulted in an increase from 12 mats to 18 mats per pallet. This change provided greater protection in storage/shipment, reduced palletizing costs, required 33 percent less pallets and reduced overall shipping weight by 37 percent.

Bomb Fin Container.—By changing the type of container for shipping bomb fin assemblies, more units were shipped at less cost due to an increase in units per container and a decrease in weight of the new container, thus lowering the transportation costs.

Fighter Aircraft Wings.—Wings for three types of fighter aircraft were not interchangeable resulting in overhaul and repair delays. A new interchangeable replacement wing was designed and procured.

Jet Engine Case.—Turbine nozzle inner case assemblies were discarded because of out-of-round condition and undersized diameters. By using a special fixture developed for the purpose, the assemblies were refurbished by heating the assemblies to 400 degrees and applying hydraulic pressure.

Jet Aircraft Engines.—Compressor valve and shroud assemblies were subject to air-foil pitting and required frequent replacement. The application of a ceramic bonding material and a zinc-rich coating extended the useful life of the assemblies.

Magnetron Tube.—There was a critical supply shortage of this long lead-time item. A value engineering study proposed the testing of all tubes removed during overhaul of the end item. Tests revealed that a large number of the tubes could be reutilized as replacement items.

Relay Switches.—The contractor was required to furnish new thermal relays in the production of a missile. Procurement costs were significantly reduced by the salvage and use of thermal relay switches obtained from obsolete missiles.

F. Analyze Feedback From Test/Use

Pre-production and System Tests.—Analyze data from early life cycle tests to seek areas for design improvement at lower cost wherever unsatisfactory performance is indicated.

Examples:

Aircrew Escape System.—In reviewing requirements for testing the parachute, a cartridge powered parachute spreader, and a pendant disconnect activator, it was found that the test data could be obtained at lower cost by adding the requirements to an existing parachute test program being conducted by another Service.

Ballistic Missile-Engine.—A service life analysis program originally set the engine life cycle of the missile engine at 54 months. With the accumulation of additional historical data, further analysis revealed the engine overhaul cycle could be extended indefinitely, thus reducing overhaul to random failures and life analysis engines only.

Unsatisfactory Reports from Field Evaluation.—Study field evaluation reports to pinpoint high initial and/or support cost areas deserving of VE study.

Example:

Flight Radar Homing and Warning Device.—Due to excessive loss of signals encountered in the radar homing device, a modification of the wiring system was scheduled. Ground tests and subsequent flight test confirmed that the function of the existing wiring system was satisfactory and the modification order was cancelled.

Logistic Support Reports on Spares Usage Rates, Maintenance Procedure, Experience, etc.—Analyze data indicating high volume use or high unit cost spare parts usage in order to decrease spares cost through design analysis. Apply VE to maintenance plans and procedures so as to save time of highly trained technicians and reduce support equipment costs.

Examples:

Aircraft Nose Wheel Tires.—No tire retread procedures existed for the nose wheel tire and the worn carcasses were discarded. Through proof-testing, a change in technical orders now allows two retreads per retreadable tire carcass.

High Lift Cargo Trucks.—Following up on a program to replace 182 high lift trucks due to termination of the 10-year life expectancy, a VE study found that the high lift body and mechanism was still in good condition. The program was revised to cover procurement of the truck chassis only, and the high-lift bodies were transferred to the new vehicle chassis.

Small Calibre Gun Barrels.—Replacement of gun barrels was mandatory when 1,200 rounds of ammunition had been fired. A modification to the gun barrel extended the barrel life to 2,400 rounds.

Thermal Batteries.—Service life for thermal batteries for the re-entry vehicle was initially established as three years. Through a comprehensive testing program it was determined that service life could be extended to 5 years, resulting in a procurement saving.

Valve Engineering
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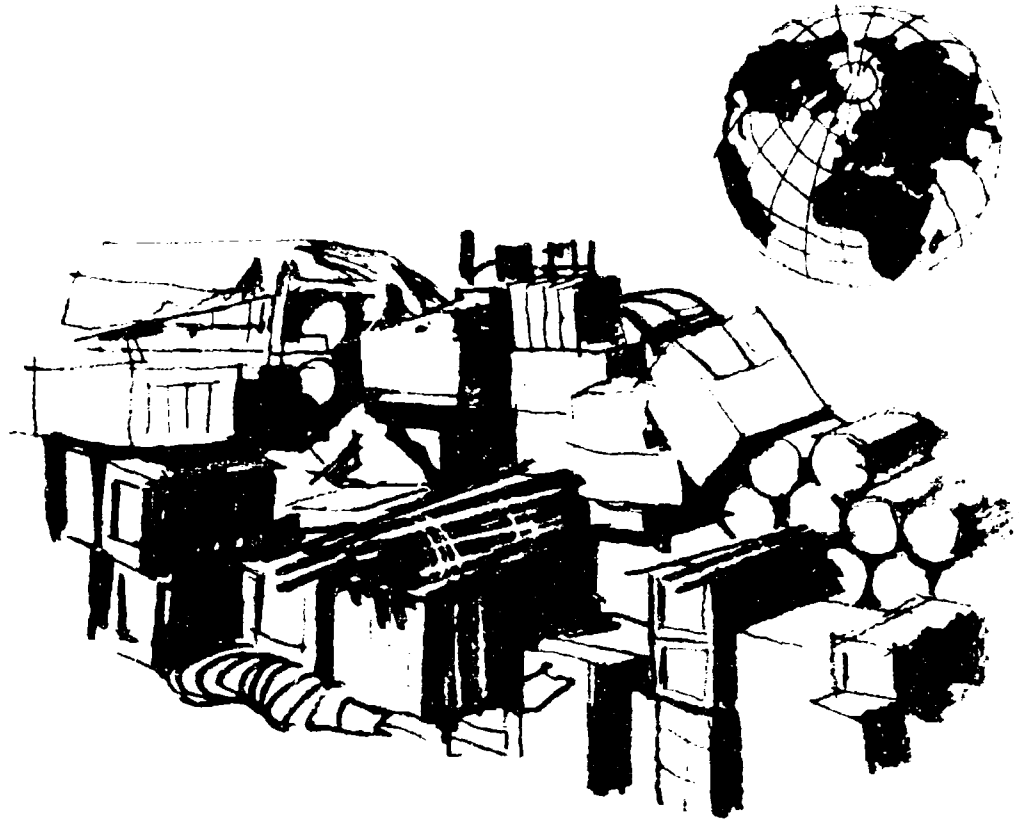
VI.

Terminating Unnecessary Operations—
(Base Utilization)

a. Close/Inactivate/Disestablish
b. Reduce Operating Status
c. Relocate / Realign
d. Terminate Military or Industrial Operations
e. Consolidate Common Services
f. Dispose of Real Property



Terminate Unnecessary Operations (Bases)

The DoD is the world's biggest landlord with forces occupying about 1,000 major and 11,500 minor military installations throughout the world. Over 31 million acres of land with improvements costing over $38 billion are required for the support of our military missions (including some 360,000 family housing units valued at $5 billion).

At the turn of the current decade there were serious questions whether our facilities structure was properly aligned with military needs. Advances in weapons technology, modernization in troop training methods, advances in communication, navigation and air defense systems are a few of the factors that cause inbalances in installation patterns.

Since 1961, the DoD has been continually reviewing Defense installations and activities throughout the world to assure that the best use is being made of them as well as the human resources associated with them.

A. Close/Inactivate/Disestablish

Place in mobilization status.—Identify real property being retained for mobilization purposes and place it in a non-operating condition requiring physical protection of the property, personnel necessary for fire protection and periodic inspections by local representatives, to insure that defects which would lead to accelerated deterioration are promptly corrected in accordance with accepted practice for economical static maintenance.

Declare excess.—Identify real property being processed as excess to the needs of the Military Departments and place it in a non-operating condition.

Transfer.—Transfer property to other military departments, Federal government departments or agencies, either for custody or use.

Disestablish.—Disestablishment normally occurs after completion of transfers or excess declarations. In the case of a naval air station, disestablishment and transfer to the plant account of another naval air station either as an auxiliary landing field or an outlying field may be simultaneous. An auxiliary landing field or a landing field is usually utilized operationally by the owning station, but at a greatly reduced cost.

B. Reduce Operating Status

Maintenance Status.—Place in maintenance status, which is an operating condition requiring minimum facilities and personnel to support emergency and intermittent operations and requiring maintenance of equipment in an operating or preserved condition such that, by addition of personnel, "Fully Operational" status will result.

Partial Maintenance Status.—Place in "maintenance status" requiring maximum personnel for security and fire protection and for the maintenance in operable or preserved condition of minimum essential facilities and utilities. Additional supporting personnel and equipment

required during periods of use will be provided by operating units concerned.

C. Relocate/Realign

C–1 Activities having custody of own real property

Location.—Relocate to a site where annual operations and maintenance costs will be reduced.

Consolidation.—Relocate for purpose of consolidation with another activity of similar nature thus reducing overhead and annual operating costs.

Tenant.—Relocate mission to be performed as a tenant of another DoD activity, resulting in savings in overhead and annual operating costs.

C–2 Activities which are tenants of other activities

Relocate to less costly tenant site or relocate for purpose of consolidation with similar activity.

C–3 Functional Activities

Realign functional activities, to improve administration and/or operational efficiency and effectiveness.

D. Terminate Military or Industrial Operations with Effect Operating Funds and/or Real Estate

D–1. Military Operations

Personnel.—Release hangar, shop and personnel support spaces for use in support of other missions.

Excess Structures.—Release excess structures for demolition, resulting in facilities maintenance savings.

Services.—Reduce support services, saving personnel costs.

D–2. Manufacturing Facilities at Certain Installations

Buy vs. Make.—Buy supply items in lieu of indigenous manufacture where economically advantageous to the Department of Defense.

Structure.—Make structures available to stations for other uses.

Equipment.—Sell or lease excess equipment to commercial manufacturers.

E. Consolidate Common Services

Complete Consolidation.—Consolidate all public works functions for two or more reasonably adjacent activities.

Centralization.—Establish a public works center to replace public works departments at locales to be serviced.

Limited Consolidation.—Consolidate common service functions (such as supply, medical, dental, laundry, fire fighting) among proximate activities.

F. Dispose of Real Property

Useable Excess.—Dispose of excess real properties after screening against all current and mobilization requirements within the DoD.

Unuseable Excess.—Dispose of, without screening against current and mobilization requirements, buildings and other structures that have deteriorated beyond economical repair and maintenance.

Foreign Excess.—Screen foreign excess real property among area commands only.

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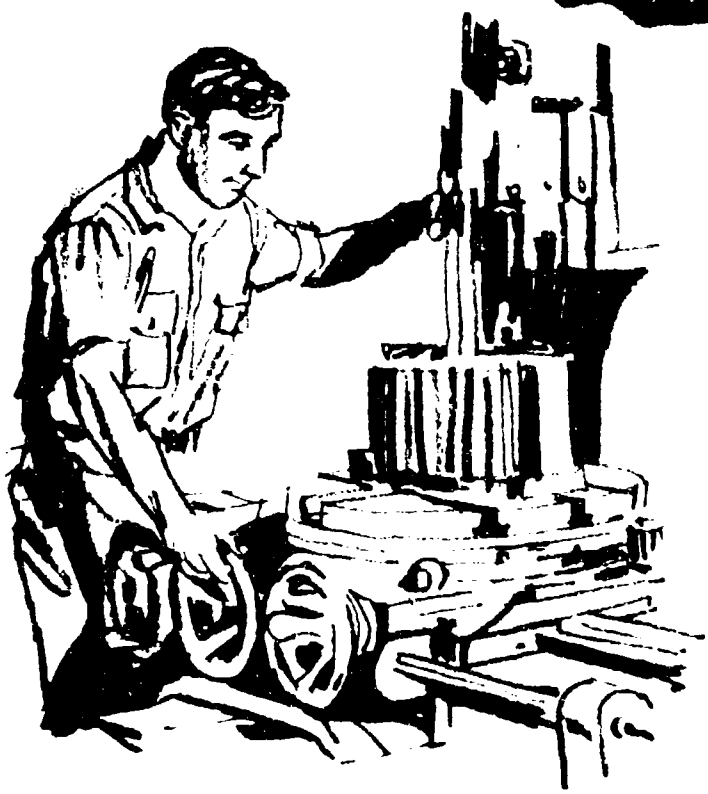
VII.

General Management Improvements

a. Manpower Management
b. Work Methods Simplification
c. Material Utilization
d. Procurement of Supplies and Services
e. Special Activities
f. Miscellaneous



General Management Improvements

This is the Cost Reduction Program's "catch-all" area.

It encompasses all functions and activities of the Defense establishment, exclusive of those emphasized in other areas of the Cost Reduction Program. It includes all general management improvement actions which reduce the cost of operation and maintenance of headquarters and field activities of the DoD components. This area also provides a vehicle for reporting savings actions taken by a joint activity (those managed by two or more military departments or miiltary services) which cannot be separately identified with and reported by any subordinate element of the activity.

This area offers a challenge to the ingenuity of managers at every organizational level, particularly to personnel having overall staff responsibility for management engineering, for organization and systems analysis and for management improvement activities.

The opportunities for effecting cost reductions in this area are quite varied.

A few of the many management improvement actions which produce savings in this area are:

1. Consolidation of management functions and organizational units.
2. Elimination of marginal activities.
3. Simplification of work methods.
4. Improved management of hospitals and clinics.
5. Improved management of training centers, laboratories and test centers.
6. Improvements in schools and other educational facilities.
7. Inter-servicing of logistics services.
8. Improvements in local logistics services.
9. Better food service management.
10. Improved management of Civil Defense operations.

A. Management of Manpower

A–1. Better Utilization of Skills and Time

Cross-training.—Cross-train all employees to maximum extent so that absence of one employee does not halt the operations (e.g., in the photo-litho area, the absence of the photographer may bring operation to a standstill if other employees have not been trained to operate the camera).

Moving.—Insure maximum use of lower-rate laborers in connection with on-post rearrangements and moves rather than carpenters, electricians and other high-paid employees.

Officer/NCO.—Convert officer manpower allocations to non commissioned officer allocations when permitted by regulations.

Prisoner Labor.—Use prisoner labor in place of Post Engineer labor for such things as cutting and transporting lumber to the stockade.

Reassignment.—Reassign workload to lower pay-category laborers for better utilization of skills and lower cost per job.

Sentry Dogs.—Reduce the number of security guards by increased use of sentry dogs.

Switchboard.—Move the telephone switchboard to guard building, for operation by guard personnel, thus eliminating the switchboard operator position.

A–2. Reorganization/Consolidation

Base functions.—Centralize functions at one base and command in lieu of each base maintaining their own capability, such as military pay, personnel, travel, and laundry.

Depot Tech Services.—Consolidate several technical services activities within one depot, producing a more flexible organization using less personnel.

Missions.—Consolidate offices with separate and distinct missions, who can use mutual administrative and support assistance.

Missions.—Consolidate two squadrons located at the same base with similar missions but under different commands. Make one squadron responsible for both missions.

Organization.—Periodically review the organizational structure with a view towards eliminating positions based on change in workload or revision of procedures.

Organization.—Reduce the number of organizational entities to decrease the supervisory and clerical requirements.

Pools.—Establish typing pools in designated areas to work under a control condition to handle typing work-load from several organizational elements.

Redistribution/Marketing.—Consolidate the redistribution and marketing functions of several defense agencies under one service at one location, when installations are in the same general area.

Workload.—Redistribute workloads to eliminate activities by assigning workloads to other existing organizations.

Workload.—Reassign workloads and responsibilities to eliminate duplication, thereby reducing manpower and facility requirements.

Workload.—Realign workloads within existing activities to reduce facilities needed.

Workload.—By realignment of responsibilities and workloads, reduce facilities needed.

A–3. Elimination of Marginal Activities

Annexes.—Eliminate Central Exchange Annexes when the area supported no longer justifies an annex.

A–4. Refinement of Manpower Requirements

Capability.—Perform study to make use of maximum capability of existing manpower resources.

Clearances.—Reduce requirement for Top Secret clearances for all typists by assigning that level work to one typist per division.

Guard Posts.—Close gates which are unnecessary so as to reduce or eliminate guards.

Indigenous Personnel.—Replace enlisted men by local national civilian employees (at a lower pay scale) for nonmilitary work such as cutting and packing leaflets in a printing plant.

Industrial Engineering.—Use work measurement and other industrial engineering techniques to determine accurate manpower requirements based on workload versus standards.

Special Activities.—Review detachments performing special missions to determine if all or part of the workload is being duplicated elsewhere. If so delete or consolidate.

Surveys.—Perform a manpower survey with particular attention to fragmentation of small functions to reduce overhead and determine if workloads could be accomplished effectively with less personnel.

Transfers.—Review requests for personnel recruitment to determine whether positions can be filled by transfer from another organizational element or realignment of duties.

Vacancies.—As vacancies occur review position for its essentiality and whether it can be converted to a trainee position.

B. Simplification of Work Methods

B–1. Methods

Checklist Form.—Use checklist form in lieu of handwritten reports.

Classified Material.—Reevaluate classified material to permit destruction or downgrading of numerous documents and eliminate need for additional classified containers and personnel spaces to handle the material.

Commissary.—Use a machine for tying rather than manual method, e.g., use of a meat tying machine by the Commissary can reduce the time required to tie meat by approximately 1 hour per day.

Computerize.—Use group counseling and computerized classification system in lieu of individual counseling and manual classification of new enlisted men.

Conveyor.—Streamline processing of incoming material by establishing a conveyor line, thereby eliminating a "hold area" and the attendant labor required by the extra handling.

Delivery.—Use larger trucks to reduce number of deliveries required

Dictating.—Use dictating equipment in lieu of handwriting copy for secretarial typing.

Fabrication.—Use glue machine in lieu of hand gluing for making fibreboard boxes.

Flexowriter.—Use Flexowriter for preparing forms in lieu of manual typing.

Forms.—Subject forms periodically to a requirements check to eliminate those which have become obsolete by revision or discontinued record keeping.

Handscribing.—Review control records to determine whether entries can be changed from typing to handscribing with pen to speed up operations and eliminate the requirement that personnel be qualified typists, e.g., mail handlers.

Labeling.—Use less expensive envelopes (possibly through the acquisition of a labeling machine which permit the use of regular tabulating paper to print addresses).

Letters.—Develop a form letter for repeated correspondence of a routine nature, e.g., preparation of a cover letter in draft and final form to request Federal Item Identification data from DLSC was reduced to a signature on an appropriate form letter. Similar action was taken on transmittal of catalog data to the military activities.

Layout.—Consolidate widely dispersed acceptance inspection locations adjacent to central receiving area.

Layout Paper.—Reduce size of layout paper in Photo Litho Branch to obtain more typed characters on each page and smaller books which can be reproduced in fewer man hours.

Linen Count.—Eliminate detailed counting of linen if shortages are inconsequential.

Mail Call.—Install "pigeon-hole" individual mail boxes rather than "mail call" system. Boxes may be obtainable from surplus post office stock, avoiding procurement costs.

Maps.—Consolidate map sheets into sets and then reproduce locally, to reduce sheets required and reduce cost of reproduction.

Mechanization.—Investigate increased use of accounting machines to develop data required rather than manual accumulation and summarization.

Mobile Carts.—Use mobile carts stocked with repair materials for "on-the spot" repairs.

Motor Scooter.—Provide motor scooters for inspectors who must take the depot taxi or walk from one distant location to another.

Operation Sequence.—Review working facilities such as desks, work tables, typewriters and file cabinets for rearrangement to conform to sequence of operations thereby speeding up operations and reducing cross-traffic.

Paper Shredding.—Use paper shredder machines to permit work area destruction of classified material rather than hauling material to post incinerator for destruction, thus saving military manhours and vehicle mileage.

Platform.—Use platforms instead of ladders to reduce time spent climbing up and down to work surface, such as cleaning busses.

Procurement.—Reduce procurement costs through consolidation of requisitioned items. Procurement costs can be reduced by increasing the quantity and lowering the frequency of each buy and a greater number of similar line items can be placed on each purchase order.

Quality Control.—Increase output by developing quality control system that reduces or eliminates rework.

Quality Control.—Use quality control sampling techniques instead of 100 percent inspection to reduce flow time and costs.

Records.—Develop an aggressive records retirement program to keep non current records moving out of high cost space and filing equipment.

Reporting Frequency.—Analyze reporting frequency to determine whether interval can be lengthened from weekly to monthly or monthly to quarterly.

Self-Service.—Adopt self-service system for issuing expendable office supplies.

Self-Service.—Initiate self-service selection and packaging of small hardware items of low dollar value, rather than packaging by sales clerk.

Storage.—Develop pro-rata rate schedule for storage charges for less than a month to simplify computation, billing and payment.

B–2. Scheduling

Inspection.—Eliminate annual Command Maintenance Management Inspection (CMMI) since annual command and general inspections are conducted and suffice for the purpose.

Overtime.—Determine whether overtime can be reduced or eliminated by revising schedules of activities generating incoming workload.

Overtime.—Develop odd day and odd hour work week schedules to reduce or eliminate weekend or evening overtime.

Production Control.—Develop production schedules based on current data instead of after the fact historical information.

Shift Change.—Eliminate overtime of 1/4 or 1/2 hour for each Security Guard at shift change by establishment of different shifts for guard personnel.

C. Utilization of Material

C–1. Substitutions

Bread Delivery.—Use egg crates, collected from messes at no expense to the government, for delivery of bread to troop messes in lieu of the standard cardboard boxes (costing 49 cents each).

Duffel Bag.—In lieu of stenciling name and serial number of inductees directly on duffel bags making them unsuitable for reissue even though in serviceable condition, a procedure can be adopted whereby the name and serial number can be stenciled on removable tapes and the bags reissued as long as serviceable.

Film Developing.—Use an alternate material of glacial acetic acid mixed with plain water in a photo lab stop bath for developing film, rather than a commercially prepared formula.

Gloves.—Replace leather workman's gloves with cotton twill-backed gloves with suede leather palms, as the cotton ones wear 4½ times longer.

Labeling.—Substitute pressure sensitive tape printed on a continuous backing sheet for preprinted labels on a gummed sheet which require bursting into individual labels, sorting, cutting to size and moistening for application.

Salute Gun.—Substitute lower-priced 10-gauge blank shotgun shells with adapter for blank 75mm shells for use in Post Salute Gun.

Storage.—Utilize unused tank rail cars for gasoline storage rather than renting commercial gasoline storage.

Water Tank.—Use of excess decompression chamber for a potable water storage tank.

C–2. Extending Service Life

Batteries.—Use a battery recharger to extend the life of dry cell batteries and reduce procurement costs.

Linen.—Use a thermo patch machine to repair linen that would otherwise be discarded.

Pallets.—Construct pallets from lumber salvaged from crates, accomplishing both a savings in the cost of pallets and a reduction in accumulation of scrap lumber.

Paper.—Use scrap bond paper from a printing press by cutting the paper down to normal office sizes.

Pillows.—Reclaim unserviceable pillows (stained, loss of stuffing, etc.) by sterilization and restuffing by commercial company in lieu of new procurement.

Xerox.—Coat xerox drum with wax which will increase the drum's life expectancy from 20,000 to 60,000 copies.

C–3. Salvage/Excess

Excess.—Screen other installation activities for excess office supplies and materials rather than procurement.

Refurbishing.—Minimize sale for salvage of items in deteriorated condition by canvas of industry to determine refurbishing possibilities.

Transformer.—Convert transformer from industrial facility to administrative use of computer center thereby eliminating cost of a new transformer.

D. Procurement of Supplies and Services

D–1. Contract vs Inhouse

Janitorial.—Review cost of cleaning services by in-house personnel to determine whether savings are obtainable by use of contract cleaning services.

Tags.—Commercially purchased identification tags for laundry lots proved to be more economical than "home made" tags.

D–2. Contract Administration

Change Orders.—Review contract requirements to establish those changes of a nature such as source of supply or destination which could be handled by a form developed for this purpose rather than a formal contract modification or Change Order which requires more detailed preparation, recording and processing.

Cost/Price Data.—Encourage contractors to provide adequate cost/or pricing data which will facilitate technical review by procurement officials, thereby reducing the number of visits to the contractors' plants by various members of the procurement team.

Distribution.—Review initial distribution of contract awards to requisitioners to eliminate advance copies which serve no useful purpose and are incomplete as to shipping information and other data furnished at a later date.

Inspection.—Evaluate inspection procedures of fruits and vegetables to determine whether inspections performed by Dept of Agriculture or other agencies can reduce or eliminate inspections being performed at supply points.

Inspection.—Eliminate minor inspections (especially those which affect appearance but not performance or durability) and sample inspection for functional defects in lieu of 100 percent inspections.

Overtime.—Encourage contractors to furnish their overtime schedules as far in advance as possible, thereby permitting staggering of work schedule of inspectors and reducing their overtime hours.

Package Size.—Review package size of commodities such as subsistence used in large quantities to standardize on larger packs at reduced unit cost.

Quality Assurance.—Analyze contractor history to determine whether contractors' inspection system is sufficiently reliable to waive certain Government inspection operations.

Quality Assurance.—Analyze results of inspection of sample lots to determine economies available through increasing the lot size consistent with maintaining quality product.

Quality Assurance.—Determine whether Government inspection of component parts can be transferred to end item assembly, thereby eliminating a number of characteristics from inspection.

Refrigeration.—Review requirements for shipment of perishable products in refrigerated cars to determine whether time from processor to refrigerated storage is sufficiently short to permit use of nonrefrigerated cars.

Requirement Contracts.—Investigate use of requirements type contracts for those items of consistent demand, general commercial availability and stable specifications to permit filling needs on a call order basis with reduced production lead time rather than negotiating and processing individual contracts for each buy.

Shipping.—Store end items at the contractor's plant destined for large shipments to small number of users for direct issue rather than processing through the supply points.

E. Special Activities

E–1. Hospitals

ADP.—Use EAM or ADP equipment to schedule recurring physical examinations and collect and process reports on visits, immunizations, etc.

Dishes.—Use disposable dishwear in communicable disease areas to avoid special sterilization processing.

Drugs.—Compound drugs, elixirs, expectorants, etc. in lieu of purchasing.

Equipment.—Purchase applicable equipment where it proves less expensive than referral to consultants or travel to distant facilities.

Outpatient.—Consolidate outpatient and minor medical services at one hospital when more than one service operates hospitals in the same general area.

Oxygen.—Install liquid oxygen source in lieu of gaseous oxygen source.

Physicians.—Reduce number of fee basis physicians by hiring full-time civilian physicians.

Radios.—Arrange to place hospital radio transmitter on remote control with local radio station, reducing need for personnel.

Serology.—Use RPR serology process rather than the VDRL process.

Serum.—Use pooled serum in place of commercial controlled serum in automated clinical chemistry analyzers.

Specialists.—Use qualified specialist from nearby service facility in lieu of travel expenses for military patients.

Wards.—Consolidate under-utilized wards.

E–2. Schools and Training Centers

Acceleration.—Place students with high scores on achievement tests in accelerated courses thereby requiring less hours in training than the average student.

ADP.—IBM grants a 20 percent discount on all IBM equipment used at an installation for educational purposes. Discount is applicable for one project per instructor. Therefore, consolidation of two IBM processes into one operation can produce additional realized savings.

Centralization.—Centralize instructor training sites based on geographical areas instead of maintaining instructor capability at each base.

Combined Training.—Separate courses for officers and enlisted men on the same subject can be combined without any appreciable loss in quality of training.

Contract Training.—Substitute the General Service Administration's workshop on effective writing entitled "Plain Letters" for contract course with 87 percent savings per student.

Course Length.—Reduce course lengths by eliminating non-essential or duplicate instruction, nice-to-know information, down time, and by improved use of non classroom hours (homework).

Equipment.—Use nonserviceable, excess or simulated equipment for training purposes rather than serviceable equipment.

Equipment.—Use salvaged railroad crossties for aerial delivery training loads in lieu of ammunition boxes filled with gravel.

Facilities.—Relocate training mission to another base with excess facilities rather than construct new facilities on the originally planned base.

Facilities.—Change training location from a contractor facility to an available DoD facility, thus reducing the cost of providing contractor with necessary training equipment.

Facilities.—Increase training productivity by making maximum use of available facilities by making a study of scheduling, course lengths, class sizes, instructor ratios, down time, etc.

Flying Training.—Increase the aircraft/student ratio and stabilize the number of flying hours per student week to reduce aircraft costs and length of contractor training.

Instructors.—Combine the training programs for local military intelligence units with Special Warfare training to reduce instructors required.

Language.—Provide for off-duty English-language instruction to Spanish-speaking basic trainees to reduce recycling of individuals who did not complete the cycle because of lack of comprehension of English.

Mailing.—Combine admission material and catalog for mailing thereby eliminating cost of separate mailings.

OJT.—Provide practical on-the-job experience for the student while economizing through the use of student labor.

Outprocessing.—Coordinate outprocessing military trainee processing to coincide with the last day of training rather than delay to the week following the end of the training.

Resources.—Use in-house training capability in lieu of planned contractor training.

Textbook.—Use commercial text rather than prepare a written program of instruction.

Training.—Provide MOS training in-house rather than send personnel to other installations thereby saving in travel costs and in trainees' performance of partial duty while attending classes.

Transportation.—Reduce transportation costs of students by using military buses in lieu of allowing commercial or POV travel.

Travel and TDY.—In lieu of off-site training of all personnel, have one man trained off site and have him instruct the remaining personnel at the home base.

Travel and TDY.—In lieu of off-base training for a group of personnel, have the instructor visit the base to provide the training.

E–3. Research and Development

Cost Sharing.—Negotiate with contractors to have them share the cost of a military program when their commercial business would benefit from the contract.

Equipment.—Develop simpler alternate test vehicles thus reducing the number of tests required and the cost of test vehicles.

Objectives.—Lower initial program objectives when they have been proven unnecessary or not economically attainable.

Tests.—Cancel programmed R and D tests when previous tests have satisfied program requirements.

F. Miscellaneous

Bookmobiles.—Replace marginal libraries with bookmobiles.

Cross Service.—Arrange for logistical base support services to be provided by another Service located in the same general area to prevent small detachments from having to develop their own capability or traveling excessive distances to obtain support from their own service.

Grass.—Investigate the granting of grazing privileges in hilly areas or rough terrain to livestock owners to eliminate the use of paid labor to cut the grass and circumvent the need to haul away dead grass which can be a fire hazard.

Mail.—Eliminate unnecessary use of airmail, emphasizing use of surface mail.

Mail Box.—Eliminate overtime of messages awaiting after-hours mail pickup by Post Office by persuading Post Office to install a mail storage box outside the office.

Overtime.—Investigate the granting of compensatory time off in lieu of paid overtime.

Personnel Roster.—Eliminate depot key personnel roster since telephone book has the same information, saving the manhours and materials needed for the preparation of the roster.

Quarters.—Utilize excess family quarters for bachelor quarters rather than pay the Basic Allowance for Quarters and the Station Allowance for off-base quarters to bachelors.

Reproduction.—Review costs of all printing, mimeographing, multilith, xerox, various copy masters, and all other methods used when multiple copies of documents are required. Develop guidance for use by all personnel in selecting the most economical method consistent with the quality of reproduction required.

Standardize.—Develop standard numerals for vehicle decals to obtain lower cost through volume purchases of one size.

Vehicles.—Increase the use of available Government-owned vehicles by issuance of Government driving license to more personnel and consequently reducing the costs of reimbursement for use of privately-owned vehicles.

Work Week.—Adjust work week in lieu of pay raise, e.g., reduction of work week from 44 to 40 hours for overseas local hires circumvented a proposed wage increase and increased worker production by 9 percent.

Zero Defects.—Reduce errors by vigorous application of the Zero Defects Program, thereby achieving savings of labor and material for corrections.

General Management Improvements

Bibliography

Selected Periodicals

Advanced Management Journal: Published monthly by the Society for Advancement of Management, Inc., 74 Fifth Avenue, New York N.Y. Subscription: $8 per year.

Articles deal with a variety of management subjects such as development of executives, labor problems, training, retirement, trends in management theory and the like. The SAM conference schedule is included, as well as book reviews.

Armed Forces Management: Published monthly by Professional Services Publishing Co., Washington, D.C. Subscription: $2 per year.

The publication consists of articles primarily on management in the military services.

The Controller: Published monthly by the Controller's Institute of American Inc., 73 Main St., Brattleboro, Vt. Subscription: $6.50 per year.

Articles deal mainly with the accounting phase of management and are intended to be technical. Major emphasis is on controllership in private industry.

Harvard Business Review: Published bimonthly by the Graduate School of Business Administration, Harvard University, Soldiers Field, Boston, Mass. Subscription: $8 per year.

Articles are on all phases of business and management. Clearly this is one of the most influential and also thoughtful of the management publications.

Management Methods: Published monthly by Jerome W. Harris, 22 West Putnam Avenue, Greenwich, Conn. Subscription: $5 per year.

Articles in this periodical are strictly of a "how to do" nature on top management problems on subjects such as welfare fund management, where to locate a freight office, the annual report, etc.

Nation's Business: Published monthly by the Chamber of Commerce of the United States, 1615 H St. NW., Washington, D.C. Subscription: $18 for 3 years.

The articles in this publication range from discussions of the Washington scene to industrial news, labor issues, and business conditions in general. Currently they contain articles on executive problems and their solution.

The Office: Published monthly by Office Publications Co., 232 Madison Avenue, New York, N.Y. Subscription: $3 per year.

This magazine will help you improve your office efficiency. Growing attention is being given to automation.

Office Executive: Published monthly by National Office Management Association, 1927 Old York Road, Willow Grove, Pa. Subscription: $5 per year.

Public Administration Review: Published quarterly by the American Society for Public Administration, 6042 Kimback Avenue, Chicago, Ill. Subscription: $8 per year ($5 for students).

Subject matter concerns all levels of public administration— Federal, state, and local. It is more concerned with theories and ideas than with applicational specifics. Useful reviews.

Supervisory Management: Published monthly by American Management Association, Inc. 1515 Broadway, New York, N.Y. Subscription: $7.50 per year.

Articles in this periodical are directed at problem areas of management, such as communications, reference checking for employment purposes, effective reading, safety campaigns, informal group structure, separations, and the like. Articles are particularly applicable to middle and lower management.

VIII.

Automatic Data Processing

a. ADP ACQUISITION

a–1. Procurement of ADP

a–2. Reutilization of ADPE

b. MANAGEMENT OF ADP SERVICES

b–1. Administratives

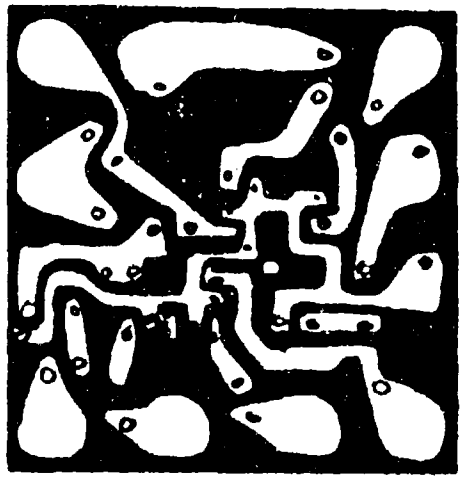
b–2. Machine Room Practices

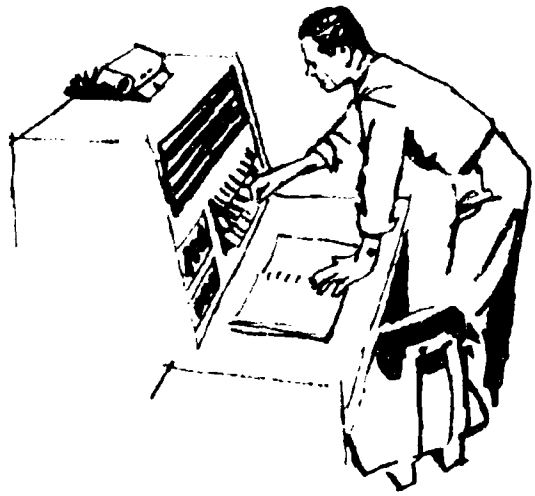
b–3. Systems Design and Development

b–4. Programing and Software

b–5. ADP Accessories and Supplies

b–6. Products





Automatic Data Processing

Through the use of computers, today's managers and system designers seek an optimum combination of men, money and machines to achieve the overall goals of the total organization. However, in managing ADP resources alone, there are many opportunities for savings. The expenses of computer software and hardware provide an opportunity to accomplish significant savings within the computer room environment. It is the objective of this area of the Cost Reduction Program to achieve savings through the optimum combination of high cost ADP resources—computers, operators, programmers, system analysts and supplies. During fiscal year 1969, the value of these resources in the Department of Defense exceeded $1 billion and required the personnel support of over 84,000 man years. The size of this effort indicates the significance of savings possibilities to the cost conscious manager.

New and changing applications of computers present consistently changing opportunities for cost reduction. Examples of cost reduction have been found: through increasing machine room productivity; by improving programmer utilization; in making full use of existing facilities through sharing; and in acquiring hardware and supplies at the least cost to the Government. As newly automated systems and procedures are installed to help people outside the computer room, new possibilities arise for assuring that computer activities operate at the lowest possible cost.

It is important to recognize that ADP program management is not immune from the principle of cost reduction. Frequent reference to current literature in the field of automation, computer operations and information systems will make the manager aware of all new and potential cost reduction activities in the management of ADP operations. The list of periodicals and other source materials described below is constantly being replenished with new money saving ideas and examples made possible through the dynamic environment of modern computer systems.

A. ADP Acquisition

A–1. Procurement of ADP

Purchase vs Rent.—Analyze planned period of equipment use, purchase price, maintenance cost and rental cost to determine whether greater economy is obtained by purchase or rental.

Rental Method.—Investigate most advantageous rental arrangements including straight lease, lease with option to buy and third party leasing.

A–2. Reutilization of ADPE

Reutilization.—When new ADP equipment is installed to replace existing Government-owned ADP equipment, determine where such displaced equipment can be transferred to and used by another installation in place of commercially rented equipment.

B. Management of ADP Services

B–1. Administrative Practices

Batching.—Reduce computer running time though greater use of batching techniques.

Consolidation.—Consider consolidation of data processing activities at the same location to reduce overhead and equipment costs, provide greater calculating or computer ability for the same or less cost, and improve operating efficiency.

Control.—Establish an ADP products control point to insure only necessary requirements are being levied on an ADP installation.

Duplication.—Review customer requirements and use of output products to reduce required frequency of processing cycles, eliminate duplication and overlap.

Forecasting.—Establish procedures for the production of a monthly "Workload Forecast" for all computer systems.

Forms.—Determine whether unneeded or duplicate forms exist.

Forms.—Design forms to provide uniformity, simplicity and economy in the recording, transmitting and reporting of data.

Holiday.—Interrogate various organizational elements to reaffirm, cancel, or recycle PCAM and ADP processing requirements over holiday period to reduce or tailor staffing requirements to confirmed priorities.

Maintenance.—Review maintenance coverage to obtain most economical combination of on-call maintenance and fixed fee contract maintenance.

Master Plan.—Develop a master plan of operations for the ADP organization. Plan should describe the proposed studies, schedule of projects, possible attainment and capabilities of the system department for the foreseeable future.

Microfilm.—Microfilm records for purposes of reduction in space requirements.

Satelliting.—Consider satelliting of some organizations on other organizations for similar data processing support.

Scheduling.—Where two or more leased computers are installed, utilize total hours available at basic charges before incurring extra shift costs.

Sharing.—Utilize time available on other government owned equipment rather than rent equipment.

Systems Review.—Review equipment requirements with objective of substituting equipment of lesser cost with no impairment of operational efficiency.

Training.—Develop training schedules and educational programs to upgrade personnel skills.

Utilization.—Perform equipment utilization analysis for possible discontinuance of ADP equipment and/or special devices (optional features).

Utilization.—Transfer work from a leased computer to a like purchased computer.

B–2. Machine Room Practices

Bursting.—Use post-type, glued-back or similar binding processes to eliminate need for bursting.

Carditioner.—Install a "carditioner" to recondition cards to a machine-readable state to save recreating old and mutilated cards.

Cards.—Utilize obsolete punched cards by overprinting on the blank reverse side.

Controls.—Prepare control sheets mechanically to eliminate manual control ledgers and reduce control processing time.

Data Preparation.—Use mark sense magnetic ink character recognition and/or optical character recognition equipment to reduce key-punch requirements and facilitate magnetic tape encoding.

Encoding.—Consider replacing key punch and verifier machines with magnetic tape encoding machines.

Halt Book.—Insure the availability of a comprehensive standard halt book containing explanation of procedures to be performed for any operational halt or program malfunction.

Metering.—Install metering devices to provide a basis for computing charges (rental and/or maintenance) and utilization rates.

Panels.—Install "common jumpers" on the reverse side of permanent panels for separate wiring panels on IBM paper tape to magnetic tape converters, to eliminate the need for one type of panel.

Record Despository.—Establish operation of a central records, cards and tape depository.

Ribbons.—Reverse computer printer ribbons to provide a relatively unused impact area for additional print impressions to increase the life of printer ribbons.

Tape Use.—Transpose information stored on partially used magnetic tape reels to a single reel through a "stacking" procedure, thus releasing the partial tape reels for re-use.

Templates.—Design and use templates placed over source documents to facilitate ease of keypunching.

Utilization.—Consider establishment of daily machine utilization report for more effective administration.

Verifying.—Eliminate card verifying to the degree possible based upon a study of the particular operation involved with consideration regarding types of source documents, end products involved, competence of key punch personnel, and error percentage which can be tolerated in the overall procedures.

B–3. Systems Design and Development

Editing.—Incorporate data editing procedures at the initial point of entry into any system to eliminate costly reruns.

Consolidation.—Consolidate on one computer those applications requiring certain features and/or components in order to discontinue such features and/or components from a second computer.

Printing.—Utilize computer systems for computing and reformatting and perform printing off-line to eliminate tie-up of costly computer ystems.

Restart.—Incorporate restart procedures in programs using multi-reel files to avoid restarting.

Source Data.—Develop methods and install appropriate equipment to provide data collection in computer media at the source.

Standardization.—Establish and use standard data elements and codes to avoid costly data conversion and coding.

B–4. Programming and Software

Assembly Programs.—Use a special program on small computer configurations which will compile or assemble programs for a larger configuration thus eliminating assembly runs on the more costly system.

Coding sheets.—Use over-printed coding sheets containing mnemonic operand requiring programmer to delete those entries not required for his program.

Flow Charts.—Use program (s) to print flow charts on the computer from program source decks.

Software.—Fully utilize manufacturer furnished software to reduce programming costs and systems development effort.

B–5. ADP Accessories and Supplies

Hypertapes.—Install hypertapes (high density character packing) to provide a reduction in processing time.

Magnetic Tape.—Use magnetic tape rehabilitation services (cleaning, recertifying) to extend service life of tapes.

Punched Cards.—Sell used IBM cards to paper dealer rather than discarding them.

Purchasing.—Consolidate requirements for purchase of computer supplies and accessories to provide price concessions through bulk purchase.

Tapes.—Increase tape library reel volume by creating short reels of magnetic tape from unused portions of standard 2400-foot reels.

B–6. Products

Forms.—Print checks and bonds using continuous forms.

Forms.—Route machine listings via prepunched cards rather than agency form which must be prepared manually.

Labels.—Prepare mailing labels and mailing lists as a by-product of the computer rather than by separate preparation through addressograph or other means.

Microfilm.—Transfer output data recorded on magnetic tape to microfilm/microfiche in lieu of off-line electronic high-speed printer.

Paper.—Reduce paper consumption through utilization of instead of six lines to an inch spacing for selected machine printed .

ADP
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IX.

Telecommunications

a. Post, Camp, Station, Base and Shore Facilities
b. Movables and Connectables
c. Satellites, Underseas Cables and High Frequency Facilities
d. Common User Switching Systems and Dedicated Circuits
e. Leased Channels and Circuits
f. Long Haul, Point-to-Point Services *Via* DECCO
g. Utilization of Telecommunications Assets

Telecommunications

Cost and performance problems in DoD Telecommunications are essentially economic problems. Their solutions call for the best choices among alternative methods of allocating resources (equipment, manpower and funds).

Economic studies, frequently called cost-comparison or economic-selection studies, help determine the most favorable courses of action in improving the performance and reducing the costs of telecommunications services. These studies normally identify the problem, weigh all reasonable alternative plans for solving it, and express the plans in dollars or other indicators.

These studies:

- Provide a scientific basis for allocating (for example: whether to expand our existing telephone plants or build a new one in order to meet demands for new services; whether to buy or lease assets; whether to select transportable or fixed facilities; whether to automate operations or services)
- Establish funding requirements of major projects for inclusion in the Five-Year Defense Program (FYDP)
- Identify costs versus benefits of system plans to meet new requirements (DoD Directive 4630.1)
- Estimate the cost of new, general or special, telephone services necessary to meet mission requirements

Economic studies often call for many preliminary economic selections before any financial analysis can begin. (For example: before the cost of a satellite ground station can be determined, various types and packages of equipment must be considered; a choice must be made between the use of a transportable and/or a fixed facility; and between the use of available power plants and new fixed or transportable power plants).

Properly made studies contribute immeasurably to the identification and the implementation of new, improved, or intensified management actions and to the discovery of unique ideas that reduce cost and improve performance of the DoD telecommunications networks.

A. Post, Camp, Station, Base, and Shore Facilities

(Improvement in local post, camp, station, base and shore facilities including telephone, teletype and data transmission, processing, distribution, switching and terminating devices.)

A–1. Long Distance Costs

Long Distance Calls.—Study long distance tolls for possible conversion to more economical Wide Area Telephone Service (WATS) or Foreign Exchange (FX) Trunks.

Audit Telephone Bills.—Audit telephone bills to determine accuracy of toll charges and compare them with authorized call list.

Common User Circuits.—Conduct traffic analyses to determine the feasibility of converting to common user service, e.g., AUTOVON, AUTODIN.

A–2. Automated Processing

Administration.—Review administrative overhead of communications, operations and maintenance with the objective of reducing the number of reports and by eliminating non-essential and duplicate information not required.

Computerized Management Functions.—Computerize functions such as circuit and cable record keeping, communications equipment inventory, billings, auditing and payments.

In-out Dialing—Conduct feasibility studies of in-out dialing to reduce operator staffing and/or improve telephone service.

In-station Message Handling—Local Digital Message Exchange (LDMX).—Determine the cost effectiveness of leasing automatic in-station message handling equipment.

Subscriber Assistance.—Make maximum use of recording and/or electronic devices in lieu of staff intercept telephone operator positions.

Optical Character Reader.—Determine cost effectiveness of using optical character reader (scanner) and standardization of the type fonts.

Record Traffic Delivery (Messages-Data).—Determine whether utilization of automated procedures or "over the counter" delivery of record traffic would be more economical.

A–3. Class of Telephone Service

Class Markings.—Class-mark certain Class A subscribers for access into common user systems and networks such as AUTOVON, WATS and FX lines thereby reducing unofficial and unnecessary costly long distance calls.

Economical Service.—Authorize selectively the most economical class of telephone service for individual subscribers (Classes A–B–C–D)

A–4. Operation and Maintenance—Communications Equipment

Government-owned versus Leased.—Determine cost effectiveness of converting Government-owned facilities to leased commercial telephone exchange service. Determine the most economical operation considering, among other things, short term/long term utilization of circuits, terminal equipment, and/or networks.

Government versus Contractor operation.—Select the most advantageous method of manning communications facilities, e.g., contractor personnel, Military personnel, civilian personnel, indigenous personnel or optimal mix.

A–5. Consolidation

Operation and Equipment.—Consolidate, where feasible, traffic distribution points, telephone exchanges, terminal devices, and other functions.

A–6. Others

Message Economy.—Reduce electrical transmission or unneeded message traffic by: forwarding record traffic by electrical means only when the urgency of time prohibits utilizing other means of communications; insuring that the number of action and information addressees is limited to those having an absolute requirement for the textual information; insuring text is brief by eliminating unnecessary words, using shorter words with same meaning and making maximum use of authorized abbreviations; making maximum use of U. S. mail and courier facilities.

Related Studies.—Consolidate related studies of communications where feasible in order to save cost of conducting studies.

Telephone Directories.—Limit the issuance of telephone directories to not more than twice a year unless unusual circumstances arise such as a mass movement of personnel or offices.

Training.—Cross-train operating and supervisory personnel to meet normal and emergency requirements.

Use of Turrets.—Use night answering turrets instead of nighttime manning of switchboards.

B. Movables and Connectables

(Reduce costs and improve telecommunications services through the use of transportables and the consolidation, interconnection and relocation of existing facilities.)

B–1. Transportables (heavy and light)

CONUS.—Determine the feasibility of expanding the use of transportable communications facilities, such as HF radio, microwave, tropo-scatter, ground control approach, Tech control and associated power supplies, in lieu of fixed communications.

OVERSEAS.—Consider, in the planning of new facilities or expansion of existing facilities, (1) the gold flow implications which favor the installation of transportables (2) the recoverability of transportable components and (3) the lesser impact on economic and natural resources through the use of transportables.

B–2. Consolidation

Facilities–DoD.—Consolidate, where feasible, inter-service and inter-base (post, camp, station and shore) telecommunications facilities (i.e., base telephone, transmitting, receiving, station technical controls, and message centers). Identify facilities to be reduced or deactivated.

Facilities—Other Government Agencies.—Consolidate facilities with other Government agencies where feasible. Identify facilities to be reduced or deactivated.

Functions.—Consolidate communication functions within a military department (e.g., validation of requirements, request for service, auditing and payments) to eliminate duplication, reduce errors and effect a reduction in manpower spaces.

(*Note*: Private line exchange service and certain select terminal equipments will be ordered, audited and paid through DECCO.)

B–3. Interconnection

Facilities.—Effect the economical interconnection of PBXs, WATS and other services within a geographical area, to reduce cost and improve performance.

B–4. Relocation

Review Facilities.—Review existing facilities for possible relocation with the objective of reducing equipment, manpower and overhead costs.

C. Satellites, Underseas Cables and High Frequency Facilities

(Improve communications through the increased use of satellite networks and underseas cables, and reduce costs through the deactivation or reduction of HF facilities.)

C–1. Satellite Networks

Navy Shipboard.—Investigate the cost of terminal equipment, message handling and reproduction, and personnel. The Navy shipboard satellite capability is expected to provide more reliable communications and reduce the need for HF facilities.

Utilization.—Conduct studies of current and projected communications requirements to insure maximum utilization of satellite and cable communications—commercial and government-owned (in lieu of less efficient and/or more vulnerable means) to satisfy known and projected requirements. (Reduced tariff rates for all long haul communications should accrue through increased usage of satellite and cable communications.)

C–2. Underseas Cables

Utilization.—Determine the feasibility of increased usage of underseas cables in lieu of HF or satellite facilities.

C–3. Reduction HF Facilities World-wide

HF Facilities.—Consider deactivating HF facilities on a case-by-case basis as the use of satellite networks and cables are increased.

C–4. Others

Reduction of other transmission systems.—Review systems such as troposcatter, microwave, etc., to determine if the use of satellites and cables would result in more economical operation.

D. Common User Switching Systems and Dedicated Circuits

(Increase use of Automatic Common User Switching Systems (AUTOVON, AUTODIN) and a Reduction in the Use of Dedicated Circuits.)

D–1. Requirements

Existing.—Review existing dedicated circuits during the first quarter of each fiscal year to determine the need for their continuance. To the extent feasible, requirements currently met on dedicated circuits will be incorporated in the common user networks.

New.—Meet new requirements through the common user systems; validate exceptions at the appropriate command level; review annually for continued exception.

Future.—Identify telecommunications requirements in sufficient time for inclusion in the DCA planning and programming for the expansion and extension of common user networks.

D–2. Excepted Dedicated Circuits

Exceptions.—Bring to the attention of the Network Manager, DCA, for future planning and programming those requirements which cannot immediately be met by the common user networks (AUTOVON-AUTODIN).

E. Leased Channels and Circuits

(Reconfiguration and the possible termination of leased channels and circuits.)

E–1. Reconfiguration

Overseas Leases.—Review and reconfigure telecommunications requirements overseas on a continuing basis to utilize to the maximum extent,

indigenous commercial communication facilities. Reconfigure (review, modify and restudy) where requirements dictate, the use of government-owned facilities, circuits and networks to achieve the most cost effective use of existing facilities. Meet any new start or expansion through the use of transportables.

Rerouting Existing Circuits.—Review existing circuits and networks with the objective of rerouting to reduce terminals, reduce costs and improve service.

E–2. Termination

Review.—Review and rejustify on an annual basis all leased circuits including transoceanic circuits. Recommend for termination those unnecessary and redundant to current needs.

E–3. Termination Liability

Negotiate.—Review semiannually all leases for reduction of termination liability charges through negotiations with carriers.

E–4. Review of Tariff Rates

Existing rates.—Negotiate with carriers for reduced rates as a result of termination and reconfiguration.

New channels and circuits.—Scrutinize carrier rate development cost data to ascertain validity of costs claimed.

F. Long, Haul, Point-to-Point Services Via Decco

(Reduce costs by secure long haul, point-to-point services through the Defense Commercial Communications Office (DECCO).)

F–1. TELPAK

Contracts.—Utilize DECCO to contract for bulk procurements from common carriers.

F–2. Negotiations

Rates.—Utilizate DECCO as the central procurer of communications services. Insure that all customers receive the best possible rates, as a

result of continuous DECCO reviews and negotiations of carrier rate packages.

F–3. Consolidation of Billings

Centralized Ordering and Paying.—Utilize DECCO as the central ordering and billing function for communications services and/or circuits for the entire DoD.

Identify the private line service for which each Department and Agency is being billed directly by the common carrier and review on a case-by-case basis those services and/or circuits for assignment to DECCO.

G. Utilization of Telecommunications Assets

(Survey of telecommunications assets for the most effective utilization of existing equipment (major items of DCS and Non-DCS).)

G–1. Survey of Assets

Inventory.—Inventory all major items of DoD telecommunications equipment (DCS and Non-DCS) to improve the management of telecommunications resources (fixed and transportables) and to make maximum utilization of existing resources. Include in this inventory the status of approved and funded facilities that will be added to the inventory and the planned changes in the future development of existing equipment. Review continually to insure that equipment on hand that is not required for current or programmed operations is made available to meet the current or future needs of the DoD.

G–2. Excess Equipment

Modification.—Modify existing excess equipment to meet new requirements.

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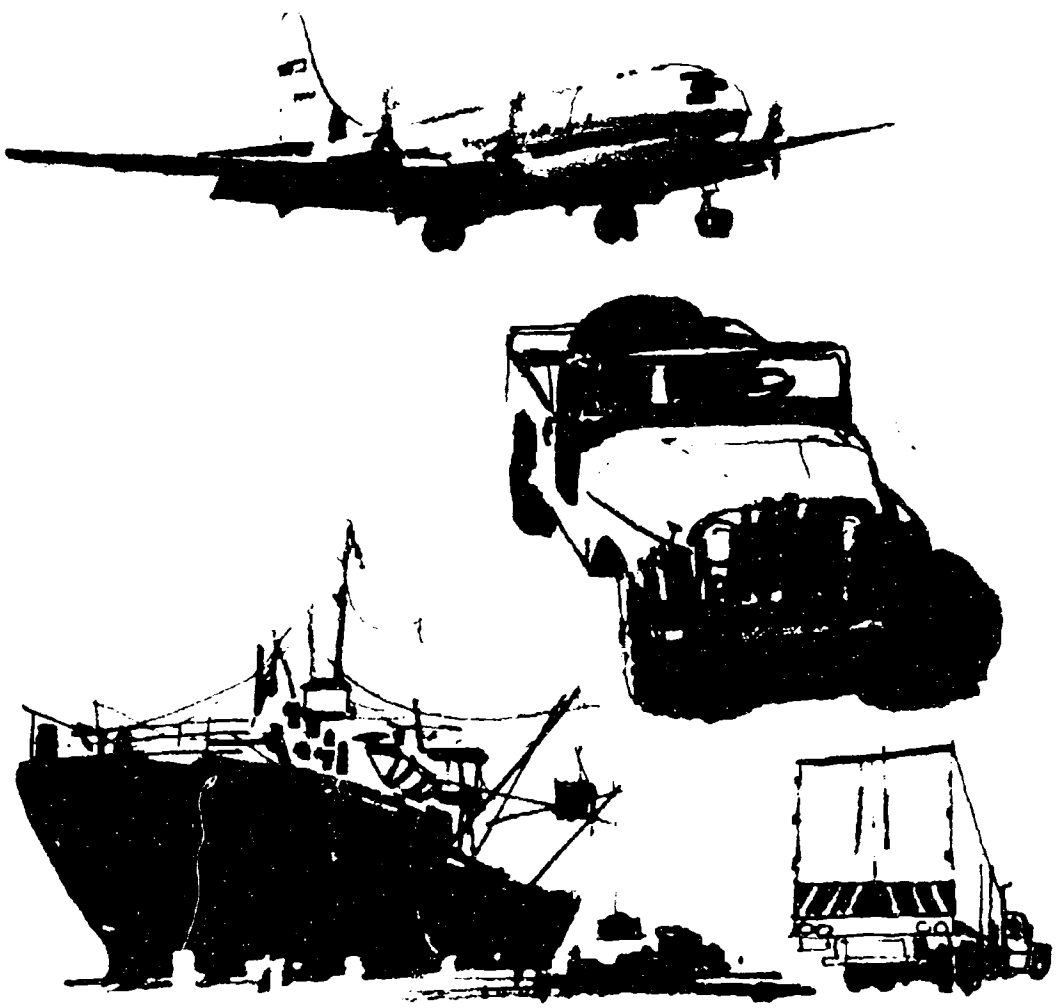
X.

Transportation

a. Freight
b. Passengers
c. Household Goods
d. Commercial-Type Vehicles



Transportation and Traffic Management

During fiscal year 1968 the Department of Defense moved 59.3 milion short tons of dry cargo, 28.1 million long tons of POL, and 9.8 million passengers, worldwide. The cost of this service, which was provided by commercial as well as DoD land, sea, and air resources, was approximately $3.7 billion, excluding any investment in equipment. Of this amount, $3.1 billion was for the movement of cargo and $600 million was for passengers.

Transportation management functions having good cost reduction potential include: (a) offer and acceptance procedures for movements through aerial and ocean terminals; (b) shipment and transshipment planning; (c) negotiations for rates, fares, and charges; (d) terminal cargo handling; (e) shipment consolidation procedures; (f) claims reporting and processing; (g) screening and routing of personnel and cargo movement; and (h) control and operation of non combat vehicles.

Significant actions taken in this area over the past several years include cost reductions in MAC airlift contracts, through bill movement of household goods, overseas mail service, and commercial stevedore operations; increased use of less than first class air accommodations; improved coordination of ammunition production and movement schedules; development of new procedures for loading UH-1's aboard aircraft, etc.

A. Freight

A–1. Shipment Planning

Airstrip.—Use airfield of shipping component in lieu of closest Air Force Base when different for Special Assignment Airlift movement in MAC aircraft.

Component.—Disassemble special weapons in oversea areas, retain inert components, and replace only the remaining components.

Consolidation.—Provide for consolidation into volume lots at vendors' plant when contract does not specify release load quantities.

Consolidation—Extend due dates to permit consolidation into load lots and shipment via less costly modes in CONUS.

Direct Shipping.—Ship materiel from CONUS depot being closed direct to customer in lieu of movement to another storage facility.

Direct Shipping.—Order shipments direct from vendor to user or aerial/water port in lieu of shipping to depot and then reshipping.

Disposal.—Arrange for change in the designated site for disposal and burial of radioactive waste in CONUS, eliminating costs of a transcontinental move and transcontinental return of the empty containers.

Diversion.—Arrange, through coordination of production and shipping schedules, for movement of MIPR-requisitioned ammunition (destined to Southeast Asia) via the lowest-cost coast.

Diversion.—Divert to CONUS port, carload/truckload lots of ammunition enroute to depot in lieu of loading and shipping a similar item from the depot.

Diversion.—Divert retrograde ammunition at an intermediate transshipment point, through inspection and minor renovation at CONUS ocean terminal, obviating the necessity for transiting an ammunition depot with both in and out line haul transportation charges.

Driveaway.—Use military drivers for driveaway movement of vehicles in lieu of rail shipment in oversea area.

Mail.—Use military highway vans instead of military rail cars for shipment of mail in oversea areas.

P.O.L.—Reallocate storage tankage at destination to permit shipment of diesel fuel in bargeload lots rather than by rail tank car in oversea area.

Production.—Revise production schedules to provide more economical shipping lots.

Substitution of Service.—Initiate exclusive truck service in lieu of contract air service when feasible.

Surveillance.—Utilize couriers and military guards round-trip between military activities and commercial contractors' plants in CONUS, through shipment planning and coordination.

Tailgate Distribution.—Draw Class I rations from commissary and take directly to units for tailgate delivery rather than to divisional warehouses for pickup by units.

A–2. Selection and Loading of Equipment

Containerization.—Use containers, when cost favorable, and reduce requirements for marking, over-packing and handling.

Loading.—Nest LCM–8's inside of LCU's for transportation by MSTS to oversea destination.

Reefers.—Move refrigerated cargo (perishables) overseas by reefer containers in lieu of movement as loose refrigerated cargo on reefer vessel.

A–3. Classification and Rate Negotiation

Classification.—Conduct technical review of shipping data to assure proper classification of explosives and other hazardous material.

Rates.—Conduct comprehensive analyses of carrier costs in conjunction with regulatory body to obtain rate reductions for cargo and mail.

A–4. Screening and Routing

Air Freight.—Ship via deferred air freight instead of regular air freight when sufficiently responsive to established due dates or mission requirements.

Automatic Release.—Utilize time gained through application of automatic release and routing procedures to provide for consolidation of export shipments for movement to cost favorable CONUS ocean terminal in lieu of primary port indicated by requisitioner.

Excess Baggage.—Ship excess baggage as air freight in passenger aircraft in lieu of shipping at excess baggage rates.

Export.—Consolidate less-than-release shipments to the geographically closest ocean terminal.

A–5. Miscellaneous

Additional Service.—Arrange for the installation of commercial pipelines to provide an additional method of transporting petroleum products.

Break-Bulk.—Operate break-bulk centers in oversea areas for consolidation and/or distribution of less load shipments to and from the port.

GBL Entries.—Print GBL's mechanically.

Hold Baggage.—Provide for self delivery of hold baggage at owner's election in oversea area.

Opportune Lift.—Use space available capability of organic equipment in lieu of commercial carriers.

Re-spoting.—Use Government tractors to re-spot commercial trailers within CONUS depot.

Utility Rail.—Eliminate utility rail equipment and operations through substitution of switching by line-haul carrier.

B. Passengers

B–1. Movement Planning

Charters.—Coordinate graduation dates at adjacent schools to permit use of lower cost chartered commercial transportation.

Escorts.—Coordinate shipments requiring military escorts, thereby reducing the number of escorts required.

Escorts.—Utilize TDY and PCS travelers to escort communication equipment when required to prevent loss and damage.

B–2. Negotiation for Fares and Charges

Commercial Buses.—Rent commercial buses on 24 hour basis in lieu of individual charter for each inbound/outbound movement between carrier terminal and military installation.

Rates.—Conduct comprehens e analysis of carrier costs in conjunction with regulatory body to obtain reduced fares.

B–3. Routing (Selection of Mode and Carrier)

Excursion Fares.—Adjust departure and arrival times where possible to take advantage of reduced air fares at family excursion rates.

B–4. Documentation

Single TR.—Consolidate individuals traveling separately between common origins and destinations under the same fund citation and issue one Transportation Request in lieu of individual TR's and tickets for each passenger.

Teleticketing.—Install Teleticketing System to eliminate messenger trips and documentation of cost computation.

C. Household Goods

C–1. Consolidation

———Consolidate individual lots if required delivery dates allow to permit application of volume rates.

C–2. Drayage

———Use Government personnel and facilities in lieu of commercial carrier for local drayage overseas.

C–3. Reweigh

———Reweigh inbound household goods shipments and pay on lower weight.

D. Commercial-Type Vehicles

D–1. Utilization

Commercial Type Equipment.—Whenever possible use commercial type in lieu of combat type vehicles.

GSA Vehicles.—Use GSA vehicles in lieu of commercial rental vehicles.

Pick-Up Points.—Establish designated pick-up points within post, camp, or station.

Radio Control.—Use radio taxi equipment.

D–2. Operations

Control.—Maintain high degree of control relative to efficient dispatch of vehicles and planned vehicle turn-over from one user-driver to another.

User-Driver.—Increase application of the User-Driver concept.

D–3. Operational Maintenance

Consolidation.—Consolidate maintenance activities and maintenance work-crews.

Service Station.—Assure maximum feasible use of Service Station type maintenance.

Warranty.—Assure maximum application of Manufacturer's Warranty provisions.

Work Schedules.—Adjust work schedules to provide maximum use of vehicles authorized an activity, thereby reducing the out of service maintenance time during the normal work day.

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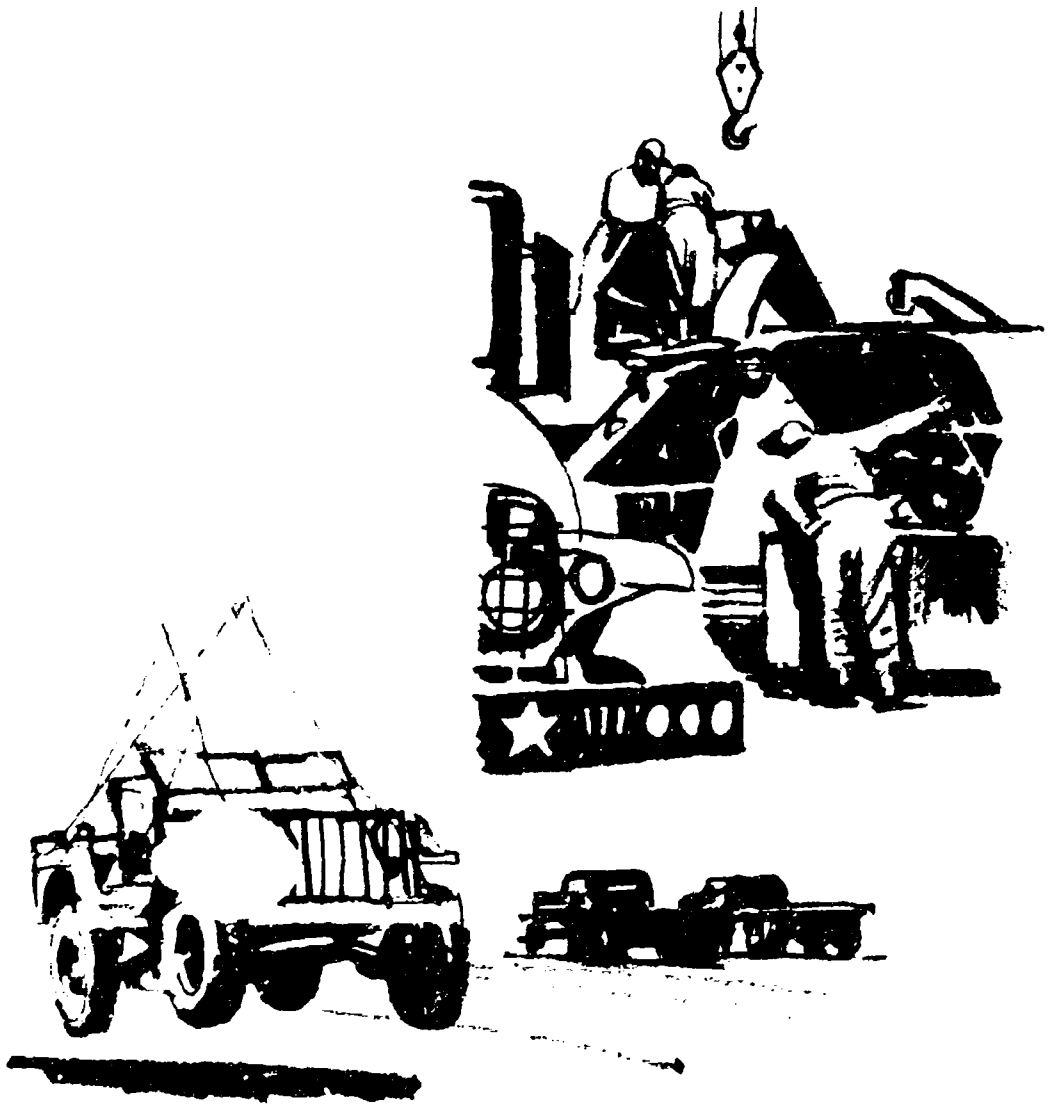
XI.

Equipment Maintenance

a. Technical
b. Industrial
c. General



Equipment Maintenance

The Department of Defense employs 225,000 people at 94 depot maintenance facilities. These employees must maintain operationally ready the multi-billion dollar Defense inventory of weapons systems, major end items, equipment, special tools, components, subsystems, assemblies, etc.

The frequency and depth of scheduled maintenance actions are expressed as technical criteria. These criteria are developed from inherent reliability, usage rates, age, operational environment and performance of the item. Maintenance requirements for resources are expressed as industrial standards for manpower, material and facility capability and capacity.

Maintenance effectiveness and efficiency depends to a great extent on the adequacy of technical criteria and industrial standards. Improvements result in fewer demands for maintenance action without a reduction in the level of equipment readiness. Improvements also produce the same work of the same quality with less resources or elapsed time.

Equipment Maintenance Ideas may be identified with effectiveness (technical criteria) efficiency (industrial standards) or both.

A. Technical

A–1. Develop Portable Equipment

Drilling and Topping.—Utilize portable machines and equipment for drilling and tapping where production type drilling is required aboard ships.

Inspection.—Use portable inspection stands and equipment. (A starter inspection stand was designed to test starter cluch adjustment, starter jaw travel, and direct cranking, using a 1,000 foot-pounds torque wrench (removable) on the 1790 AV or LV engine series.)

A–2. Devise New Tools, Instruments, Diagnostic Equipment

Diagnostic Equipment.—Development of methods and procedure for examining and recertifying used material. (Track blocks can now be appraised for cracks, metal fatigue and excessive wear and special tools and fixtures permit installation of new bushings, track pins, spring pins and seals so that undamaged track block can be re-used in the crawler type track used on LVT family vehicles.)

Special Tools.—Design and fabricate special tools where conventional ones are costly to use. (Diesel engine flex coupling spring packs were pried and pulled out of their recesses using conventional tools. This took 1½ Man Days Per Engine. A special puller was fabricated (from scrap) with which the spring pack leaves were first clamped together to relieve tension and then removed using a sliding knocker on the puller rod. This procedure takes 1 Man Hour Per Engine.)

A–3. Develop New Repair Techniques

Checkout.—Develop in-place checkout system. (An improved method for checking sixth stage rotor blades of J–52 aircraft engines was developed, making it unnecessary to remove engines from aircraft.)

Design.—Reduce maintenance equipment costs through greater application of modular principles of design for the more universal or standard pieces of maintenance equipment and support or test equipment.

Design.—Analyze application for receptiveness to simpler design. (Installation of expansion loops in ventilation flex connections had been a problem to the Sheet Metal Shop fabrication section for some time. The improved method has eliminated the problem by using a straight flex connection in those cases where expansion is not required to comply with ship structures.)

Drilling.—Drill new holes in parts where old holes have been worn oversize. (Sprocket hubs with elongated mounting boltholes are being reclaimed by drilling new holes and plugging the elongated holes.)

Engineering Assistance.—Establish procedures to provide repair process routings and engineering assistance for problem overhaul and repair. (As was done for repair of CN 502 Gyros used on Bomb Directing Sets.)

Example of Salvage.—Salvage corrosion-pitted main landing gear outer cylinders, thus eliminating replacement cost of new cylinder.)

Example of Salvage.—Conduct engineering study and establish procedures for reclamation of Turbine Nozzle Guide Vanes in overhaul of the J–52 and J–57 aircraft engines, thus eliminating requirement for purchasing new vanes.

Grinding.—Smooth damaged edges by grinding. (Damaged and/or eroded trailing edges on turbine nozzle vanes are repaired by grinding.)

Machining.—Develop procedures for machining in-place where economically advantageous. (An improved method of machining cap cover bushing on the ASROC loader crane was developed. Brass bushings were distorted while pressing out cap cover, resulting in a loss of material and manhours to replace. The new procedure is to leave the bushing in bearing cap cover and machine in place the recess for felt packing.)

Materials.—Substitute less costly repair materials. (Repair oversized and worn generator housing armature and starter shaft bearing liners using molybdenum metal (Spray Bond) instead of chrome plating.)

Patching.—Patch cracked surfaces. (Unserviceable M14 rifle stocks were repaired by filling the cracked or broken stock with a mixture of resin, fiberglass and dye.)

Plating.—Grind away corrosion and re-plate corroded surfaces. (Repair A-3 aircraft nose landing gear assemblies by grinding corroded, worn and/or damaged areas then chromeplating these areas to the specified size. This action substantially reduced the rejection rate and subsequent replacement.)

Rebuilding.—Rebuild worn equipment. (Low and reverse range bands for CD-850 service transmission are rebuilt by replacing lining material, modifying band and strut, and installing new pins in struts.)

Regraining.—Develop procedure for replacing overage propellant grain. (Terrier sustainers and boosters had exceeded shelf-life and did not meet specifications. A regraining process was developed for Terrier components which updated these missiles for Fleet use. This process was less costly than the previous procedure of purchasing new motors.)

Reinforce.—Develop procedure for reinforcing weakened parts. (Flap fittings for RA-5C A/C were coded as non-repairable when cracked at the hoist fitting hole. A repair method was developed consisting of taking a piece of 4130 chromolly sheet steel, fitting it to the inside contour of the flap fitting in the area of the cracks and bolting it in place. This re-enforcement restored the fitting to serviceable condition and could be made in place without removing a lot of other parts for accessibility.)

Salvage.—Restore material by using salvaged parts from other material scheduled for disposal. (By salvaging the fairings and end fittings from deteriorated towcables and reutilizing them on new electromechanical cable, variable depth sonar towcables were restored to service condition.)

Sealants.—Use sealants for leaks in lieu of replacing unit. (Formerly, if leaks were detected around the flange opening on F-9 forward and aft fuselage fuel cells, the flange fittings were replaced with new ones. In correcting the leaks which were found on 22% of the fuel cells on F-9 aircraft processed, an average of 3 flanges per cell were replaced. A method of repair was instituted by grooving out cracks around flange outside of cell, applying sealant compound in grooves and installing patch on inside and outside of cell.)

Selective Overhaul.—Institute an examination and evaluation procedure in the overhaul and repair of aircraft avionics in order to eliminate unnecessary overhaul work on those avionics which still meet operational requirements.

Special Tools.—Innovate processes for repairing items coded nonrepairable. (Design of special tooling established an effective welding and grinding operation to replace the knife edge on J57-P-16 and P-20 turbine air seals that had been coded non-repairable.)

Tolerances.—Restore tolerances to worn parts. (Spur gears for the LVT family of vehicles were discarded when worn beyond tolerance. Under an improved method, the gear is built up in the bearing seat area through the use of submerged short arc welding and then ground to original dimension.)

Welding.—Reclaim broken parts by welding. (Reclamation of Case Gear left and right shock adjuster M53 self propelled gun was made possible by submerged-arc-welding process and turning to size on lathe. These units were previously discarded.)

Welding.—Eliminate adapters by using materials that can be welded. (Deck and bulkhead tubes formerly consisted of two basic pieces: a brass machined stuffing tube threaded to accept a packing nut on one end and a pipe adapter cut to length and threaded on one end. As a result of a method improvement study, a one-piece steel or aluminum swage stuffing tube is now used which can be welded to steel or aluminum thus eliminating the adapter with its cutting, threading and assembly operations.)

Workload.—Reduce maintenance load through improved maintenance techniques, improved specifications, improved quality, and increased operating time between maintenance cycles.

Work Study.—Conduct an engineering study to improve methods and reduce costs of work being performed at maintenance centers.

A–4. Increase Service Life of Equipment

Covers.—Install protective covers. (Mechanical damage protection was provided for the A-4 aircraft antenna. This cone provides protection from mechanical, thermal, rain, and oil damage, thereby eliminating excessive maintenance on these antennas.)

Design.—Incorporate design change to eliminate cause of failure. (Extreme changes of pressure in the upper radiator of the International Harvester Tractor, Models R-200 and L-200 caused by constant operation in mountainous and sea level terrain caused continual flexing of the upper tank resulting in metal fatigue and splitting of the tanks. Pressure is maintained at a reduced level in the upper tank by drilling a 7/32nd-inch hole in the thermostat, thereby eliminating excessive pressure changes and the resulting flexing.)

Environment.—Develop a protective environment where temperature causes failures. (Boat engines became cold while at anchor on the firing range. When unauthorized craft appeared on the range these boats were required to accelerate at high speed to overtake them which resulted in cracked engine heads and other damage. Water heaters were installed next to the boat engines to keep them warm which prevented excessive damage and saved the cost of purchasing new engines.)

Retard Deterioration.—Provide cathodic protection to the hulls of ships for retardation of underwater corrosion.

Wear Limit Tolerances.—Establish wear limit tolerances. (Wear limit tolerances were not established for axles on 5-Ton Trucks. Any variation below new axle requirements was cause for discarding the axle. Wear limit tolerances established for axles on 2½-Ton Trucks were established for 5-Ton Trucks thereby allowing the salvage of previously discarded axles.)

B. Industrial

B–1. Improve Shop Procedures

Administration.—Reduce production delays by improving the balance in resources including—

(1) Use of labor vs. use of material.
(2) Redistribution of production personnel vs support personnel.
(3) Balance in labor ratings by trade or skill levels.
(4) Workload vs facility capacity.

Administration.—Reduce lost time caused by—

(1) Material delays.
(2) Equipment not available.
(3) Lack of technical data.
(4) Lack of critical skills.
(5) Personnel leave.
(6) Peak workload.
(7) Low workload.

Coatings.—Sanding of metal was done with a carborundum disc with nothing applied to it. Discs are now coated with a layer of beeswax which cuts down the time to do a job by 10 percent and saves wear on the discs, reducing the number discs needed by approximately 13 percent.

Heat Gun.—Use an Electric Heat Gun for bending and shaping PVC (plastic) pipe aboard ship and shop. (PVC pipe is used in the air conditioning condensate piping; distilled water piping in battery wells; ABC washdown piping; and cooling water piping for electronic equipment. The old method required the services of 2 men to accomplish this work. A coppersmith would heat the pipe with a torch while a pipefitter would bend, or shape the pipe to the desired degree or angle. The new method permitted the pipefitter alone to heat the PVC piping with the Heat Gun and, at the same time, bend the pipe to the desired shape.)

B–2. Improve Shop Layout

Administration.—Increase productivity through additional emphasis on Technical and Industrial Management of maintenance facilities including improving shop procedures, redistribution of resources between shop or facilities, and implementation or approved plans for plant modernization.

Assembly Line.—Use production techniques where feasible. (An assembly line type operation was established for the manufacture of catapult track covers required for overhaul of an aircraft carrier.)

Machine Adaptations.—Adapt available machines to alternate uses. (Rifle cleaning machine used to clean M–1 rifles was modified to clean M–14 rifles.)

B–3. Improve/Improvise Jigs and Fixtures

Installation.—Make jig to enable replacement of damaged part in an inoperable component. (A jig for installing replacement signal harness in the HT/IT missile warhead shroud undergoing repair was fabricated instead of replacing the entire shroud.)

Production.—Develop tools to convert operation to production process. (Development of a tool which created a leak proof joint permitted the cutting of transformer gaskets from sheet cork in dovetailed sections in lieu of cutting a one piece gasket.)

Rework.—Develop fixture that will permit mechanic to perform two operations at the same time. (A blade tip grinding fixture was fabricated to permit simultaneous shortening of the J–52 Engine Compressor Discs on aircraft engines undergoing rework.)

B–4. Consolidate or Combine Maintenance Functions

Localize.—Repair aircraft components at local Aircraft Maintenance Departments whenever practical in lieu of shipping to overhaul and repair points (depots). (A central Aircraft Engine Repair Shop was set up at NARF's to provide needed maintenance on those aircraft engines not scheduled for a complete overhaul.)

Overlap Consolidation Reassignment.—Reduce overlay of maintenance effort. Consolidate resources (shops and support equipment) and eliminate or reassign responsibilities that are marginal in support costs and effectiveness.

B–5. Maximize Use of Industrial Plant

Equipment.—Consider alternate uses of available equipment. (Use ultrasonic cleaning techniques for cleaning the T–58 aircraft engine compressor rotors and compressor stator segments.)

Equipment.—Reclaim damaged parts by acquiring new repair equipment. (The propeller section uses 48,000 9⅛" diameter abrasive discs yearly to grind propellers to proper tolerances. 32,000 discs are 24 grit and 16,000 are 50 grit. In grinding propellers, only 2⅛" of the discs are used before discarding. A management decision was made to purchase a disc trimmer which now permits reclaiming these discs by cutting away used parts. The reclaimed discs are used on existing 7" grinders, with resultant savings.)

Equipment.—Utilize Rectifiers in lieu of Motor Driven Generators for low hydrogen electrode welding. Rectifiers supply the proper voltage output, which greatly increases efficiency of welds by reducing radiological defects, worm holes, oversized fillets and abnormal convexity.

Facilities.—Use available facilities to repair damage in lieu of buying new component. (The former method of repairing a particular type of deck sander was to buy a rubber sleeve for $21 that resurfaces the damaged drum.)

Tools.—Consider available tools for work now performed manually. (Used the fiber depositor gun instead of hand lay-up method for manufacture of fiberglass antenna reflectors.)

B–6. Increase Use of Personnel Skills

Assignments.—Enhance operational capability by prudent assignments of high maintenance skills so as to reduce downtime for equipment being repaired in shops and reduce maintenance manhours within the scope of sound maintenance and operating practices.

Contracts vs In-house.—Repair defective galvanometers in-house (Naval Rework Activity) rather than farm out to contractor.

Organization.—Consolidation of second and third echelon electronic maintenance support resulted in redistribution of technician billets and improved personnel utilization.

Schedules.—Reduce work-shift overlap time to only five (5) minutes to provide for more effective utilization of manpower through reduction of lost man-hours.

Specialists.—Initiate new procedures for providing effective control in repair of aircraft gyros by (1) writing detailed repair process routings, and (2) providing engineering assistance on difficult repair problems.

C. General

C–1. Develop the Correct Standard for Repair

Analysis.—Reduce the scope of overhaul and repair through an engineering analysis and review by a specially assigned committee. Causes for excessive maintenance manhours can be determined and corrected, unnecessary maintenance functions can be eliminated, and new repair and inspection guidelines can be established.

DIMES.—Reduce manhour expenditures by the application of Standards Improvement under the DIMES Program. Conduct a continuous effort to improve performance and increase productivity by development and application of quality standards to all repetitive items of maintenance work performed.

Example Under DIMES.—The use of improved methods and the application of engineering performance standards for shipboard cable pulling and wireway fabrication saved $1,019,000 at Long Beach NAVSHIPYD. Two of the reasons for the savings were: (1) reducing time of securing cable hangers by controlled stud welding operations, and (2) reducing time of stripping cable conductors for new connections by using clean cable free of sealing compound.

Example Under DIMES.—Under the old method of bonding lead to steel, the steel to be lead-coated was cleaned by grinding, using acid, wire brushing, blasting with metallic shot, etc. Under new method, steel is cleaned with a "needle gun". Results have passed all tests satisfactorily.

Example Under DIMES.—In the bending pipe process, heavy lubricants such as tallow or grease were previously applied to the interior and exterior of the pipe. On completion of the bending, this grease or tallow had to be removed. Experiments performed by the shop revealed that lard oil could be satisfactorily used and the cleaning time per pipe section would be reduced by 5 minutes. The cost of the material is approximately the same.

C–2. Mechanize Production Planning and Control

ADP.—Old Method—maintenance of the automated data collection system for NARF Alameda was supplied by an outside contractor. The cost of two shift coverage six days per week: $158,580 per year. New System—as a result of management action, the maintenance of the data collection system is now performed in-house by the Plant Services Division. Four electronic mechanics are required to maintain this system.

C–3. Improve Quality Assurance Procedures

Sampling.—Apply analytical rework and product sampling techniques to eliminate certain inspections and rework functions.

Sampling.—Increased use of random sampling technique in lieu of 100 percent inspection results in decreased inspection manhours with no reduction in quality.

C–4. Improve Shop Repair Parts Stockage

Inventory Balance.—Reduce shop inventory of work in process or support parts per unit of work produced.

Reutilization.—In the process of overhauling the F–9 flying tail actuators, the activity experienced a critical parts shortage (ball nut and screw assembly). These parts were unavailable from any source including the manufacturer. A Beneficial Suggestion was submitted which suggested purchasing 50 surplus actuators (less electric motor and pump) for $100 each. As a result of the Beneficial Suggestion, the NARF NORVA was able to avoid surveying 50 actuators, as well as preventing a serious work stoppage.

C–5. Improve Material Handling and Flow

Equipment.—Linecarts used to be transported one at a time for fork lift. A cart-carrier capable of transporting ten carts at a time was built from a flat bed trailer.

Equipment.—Prior to August 1966, the movement of pipe was accomplished by crane. This required the services of a crane operator and two floor men. An adapter was fabricated for use on a fork lift truck that permits the fork lift operator to move pipe without the assistance of crane or floor men, saving 3½ hours a day in labor costs.

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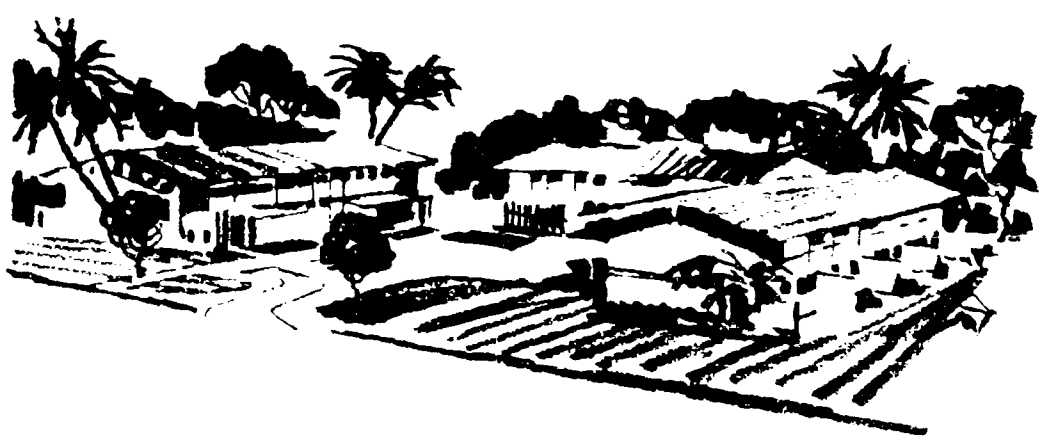
XII.

Military Family Housing

a. Operation of Utilities
b. Maintenance of Real Property
c. Minor Construction
d. Support Services
e. Administration and Management



Military Housing Management

The military departments own over 360,000 family housing units valued at $5 billion. Annual cost of maintaining and operating these units exceeds $375 million.

This housing inventory requires administration, repair, alteration and improvement, utility services, custodianship of equipment, and other kinds of servicing. Savings accrue in improving management practices, effecting utility consolidations, lowering utility rates through renegotiation, conserving use of utilities, having occupants fully discharge their responsibilities for grounds care and minor maintenance, better work planning and scheduling, judicious contracting out of services and repairs *vs.* performance in-house, careful screening of repair and improvement projects, systematic reviews of costs, and application of standards to measure performance.

In recent years, the Department of Defense has centralized housing management, instituted firmer planning to modernize and upgrade units, phased out many inferior dwellings adopted a uniform cost accounting system for this program, increased the occupancy rate so as to save on Basic Allowance for Quarters, and updated commuting standards.

A. Operation of Utilities

A–1. Electrical

Capacitors.—Use static capacitors on circuits to improve power factor.

Conservation.—Enforce electrical conservation to eliminate waste.

Lamps.—Survey requirements to eliminate over-sized lamps and over-lighted areas.

———Develop cyclic relamping programs to avoid spot replacements of light bulbs (particularly where replacement involves industrial facilities or the use of specialized equipment).

———Discontinue issuance of light bulbs to family housing occupants.

Load.—Schedule heavy loads for off-peak hours to reduce peak demand charges.

———Conduct transformer load surveys to permit reduction in transformer capacity by combining loads of adjacent transformers and de-energizing unneeded transformers.

———Investigate feasibility of installing load control devices to disconnect appliances at hours of system peak where large housing areas are equipped with electric water heaters and/or clothes dryers (so as to improve load factor and reduce billing demand).

Meters.—Reduce or consolidate existing metering points.

———Purchase privately owned electrical systems on the installation to reduce metering points.

Rates.—Renegotiate more favorable rates in unit cost or in peak demand charges.

———Purchase power from other contiguous government agencies.

A–2. Heating

Condensate.—Conduct surveys to determine economics of returning condensate to boiler versus wasting condensate.

Conservation.—Enforce heat conservation to eliminate waste.

Controls.—Eliminate overheating by use of automatic thermostatic controls to shut off heat when not required.

———Install automatic controls on boilers and heating plants to reduce personnel requirements.

———Increase boiler plant efficiency by improved procedures or controls.

———Install surveillance systems to monitor operation of small or isolated plants.

Corrosion.—Utilize corrosion test rings in condensate return lines to assure boiler water treatment for condensate line protection so that maximum life expectancy can be obtained from installed lines.

Fuel.—Use interruptible gas services with standby fuels where lower costs can be achieved commensurate with construction costs for standby fuel equipment.

———Convert boiler and heating plants to use more economical fuels where costs of conversion will be amortized by savings within the guidelines established by DoD.

———Conduct an economic study to determine whether the cost of purchased bottled gas is less than the cost of in-house recharging.

———Conduct an economic study to determine whether costs of delivering fuel oil to points of use by contractor is more economical than delivery to bulk storage and distribution to points of use by post personnel.

———Reduce fuel costs for assuring that premium fuel are not requisitioned unless fully justified.

———Review delivery schedules and solid fuel handling practices to reduce or eliminate double handling.

——— Obtain competitive bids for LP gas.

Inspection.—Use roving operators to check small multiple plants instead of using full-time operators.

———Check heating systems for excessive blowdown, improper venting, and improper use of steam or hot water from primary circuits.

———Install access panels in forced air furnaces where necessary to allow occupants to change or replace filter.

Insulation.—Conduct surveys to determine economic feasibility of piping or building insulation to reduce heat loss.

Leaks.—Conduct leak surveys on gas distribution systems to determine repair requirements and keep gas losses to a minimum.

Load.—Cross connect boiler plants to permit serving of load from one plant where economically feasible.

Maintenance.—Modify heating plant equipment to eliminate recurring maintenance and repair problems.

A–3. Water and Sewage Systems

Water

Chemicals.—Use standard chemicals for water treatment rather than high cost brand name items.

———Use untreated water for flushing and other purposes where desired results can be obtained.

Conservation.—Enforce water conservation.

Controls.—Install automatic equipment or remote controls to reduce operating costs.

Faucets.—Install automatic closing faucets and similar devices to reduce water wastage.

Flushing.—Eliminate continuous flushing devices to reduce use of water.

Leaks.—Conduct leak surveys to eliminate loss in distribution systems.

Rates.—Negotiate lower purchased-water rates.

Sewage

Automate.—Install automatic controls or remote controls for plants and pumps where feasible.

Drainage.—Eliminate inflow of storm drainage to reduce treatment costs.

Rates.—Where feasible, contract sewage disposal through municipal systems in lieu of operating a Government owned plant.

———Negotiate lower purchased sewage disposal rates.

A–4. Air Conditioning and Refrigeration

Automate.—Provide necessary controls on outside air intake to allow cooling with outdoor air when climatic conditions permit, thereby saving the cost of operating the air conditioning plant.

———Install automatic control and alarm equipment to reduce personnel requirements.

———Install automatic door closers and similar control devices to reduce loss of refrigerated air in cold storage plants.

Condensers.—Recirculate condensing water used for air conditioning and refrigeration equipment in lieu of wasting it.

———Use air-cooled condensers where economically justified.

Equipment.—Replace small air conditioning units with central units to reduce operation and maintenance costs where costs can be amortized by savings.

———Give consideration to use of a filter cleaning plant where a large quantity of reusable filters are in use at a base.

Filters.—Consider using disposable filters and instruct housing occupants on how to change them.

Occupancy.—Close down air conditioning systems during periods of little or no occupancy of buildings.

Overcooling.—Place air conditioning systems in a standby position as soon as the season permits.

A–5. Miscellaneous

Corrosion.—Install cathodic protection on underground utility lines where studies indicate savings will result by extending useful life.

B. Maintenance of Real Property

B–1. Dwellings and Systems

Materials.—Use materials which result in lower over-all maintenance costs, such as paint with a longer life.

Occupants.—Consolidate personnel and activities to the maximum so that buildings can be vacated, thereby reducing utilities and maintenance costs.

———Institute self-help program by occupants to reduce maintenance costs. As feasible, have tools and material covering minor repairs and usual housing maintenance provided by maintenance shop.

———Hold occupants liable for damage and deterioration beyond fair wear and tear to reduce maintenance costs.

Schedules.—Utilize open end contracts for painting in winter months so as to take advantage of lower unit prices and reduce down time between change of occupants.

———Specify standard interior paint schemes to permit one-coat coverage.

———Install plexiglass on storm doors in lieu of original glass which will result in less breakage and service calls.

———Use fiberglass coating for leaking shower floor rather than replace ceramic tile.

———Lower the level of maintenance to reduce costs, e.g., frequency of interior painting.

———Paint quarters by contract on unit (square) basis rather than job basis (set of quarters) and utilize maintenance personnel rather than contract method on small jobs.

B–2. Utility Systems

Automate.—Automate equipment and/or systems to reduce manpower requirements.

Quality.—Perform maintenance and use materials commensurate with realistic program requirements so as to avoid over or under maintaining.

Schedules.—Program maintenance, repair and replacement work during off peaks and seasons to minimize service interruptions.

B–3. Other Facilities

Automate.—Install labor saving controls/devices in those facilities where economically justified.

Quality.—Utilize improved maintenance and repair materials to reduce recurring maintenance needs.

Schedules.—Review repair and maintenance performed at little used facilities to avoid overmaintaining.

B–4. Pavements

Excess.—Eliminate pavement maintenance where excess pavements are being used for unessential activities.

Patching.—Utilize patching to the maximum in lieu of more costly overlays.

Seals.—Establish sealcoating cycles to reduce long-range maintenance costs.

———Establish crack sealing program to prevent major damage to pavement.

Sweepers.—Use sweepers and magnets to reduce damage by foreign objects to tires and jet engines.

Traffic.—Establish necessary controls and zoning to insure proper use of rev-up areas, taxi lanes, fueling areas and maintenance areas to reduce pavement damage to the minimum.

B–5. Land (Grounds)

Forestry.—Increase yield of forestry products by woodland management so that revenue gained can be used to reduce overall costs of woodland maintenance.

———Sell timber before outleasing property.

Mechanize.—Increase efficiency of grounds maintenance personnel by use of labor saving equipment such as gang mowers and large tractor-drawn rotary mowers.

Occupants.—Institute self-help program, provide incentive and special tools and equipment.

Outlease.—Outlease Government property, including agricultural and grazing areas, to reduce costs of maintenance and repair, utilities, vegetation control, drainage maintenance, and erosion control.

Vegetation—Utilize chemicals to kill or retard vegetation growth where this will result in lowered costs.

———Eliminate overgrown or unneeded trees, shrubs, vines and hedges which require excessive maintenance.

Watersheds—Establish procedures for control and protection of watersheds to prevent erosion.

B–6. Furniture and Equipment

Maintenance.—Make minor furniture repairs in the house. Use slip-covers (washable) rather than re-upholster.

Moving.—Avoid extra moves by transferring to the incoming family custodial responsibility for furniture in place when outgoing family leaves. Minor changes, if necessary, can be made later.

Purchase.—Purchase through GSA contracts or from GSA stock when possible.

Replacement.—Furniture and equipment that cannot be economically repaired should be salvaged for usable parts and then disposed of. Use

DASD (FH) memorandum to ASD's (I&L) dated 26 July 1965 as guideline for decision to repair or replace.

Storage.—Identitfy and keep Family Housing furniture separated from other base furniture. Keep up-to-date records of the location of all furniture and furnishings.

C. Minor Construction

Conversion.—Review feasibility of converting oversize dwelling units with high annual O&M costs to two or more adequate units.

Goals.—Establish targets to reduce expenditures for alterations and minor construction.

Review.—Establish a review procedure for work submitted to eliminate unessential alteration and minor construction work.

D. Other Engineering Support Services

D–1. Fire Protection

Alarms.—Eliminate unnecessary manual fire alarm boxes and fire reporting telephones.

Extinguishers.—Eliminate unnecessary fire extinguishers.

———Reduce total number of fire extinguishers by omitting them from dead storage and seldom entered buildings where it is prudent to do so. (Work crews entering such building should carry an adequate supply of the appropriate type of fire extinguishers along with their other working tools.)

Manpower.—Eliminate or reduce strength of fire companies where protection from local civilian or other military fire departments is available.

———Reduce size and number of fire companies where risks have been reduced by use of noncombustible or fire resistive construction, dispersal, or by installation of automatic sprinklers and similar equipment.

——Use fire department personnel to answer non-fire emergency calls after normal duty hours and on week-ends (when workload studies show the time to be available) to reduce requirement for full-time non-fire emergency personnel.

Vehicles.—Use standby fire trucks jointly with neighboring installations to reduce the number of standby vehicles.

D–2. Custodial Services

Contract.—Use contracts where service can be performed at a lower cost than by use of in-house forces.

Mechanize.—Increase productivity of workers by use of mechanical equipment and improved work methods.

Scope.—Perform custodial services only for those activities authorized this service.

———Limit services to minimum required to provide for essential sanitation and cleanliness.

D–3. Entomology Services

Detection.—Establish preventive measures for the detection and treatment of incipient termite infestations in existing structures to prevent serious structural damage.

Materials.—Utilize chemically treated lumber and other forest products for protection from wood destroying insects and fungi.

Modernization.—Reduce personnel requirements by use of modern equipment or better programming.

Methods.—Select most economical and effective methods of mosquito and similar biting insect control.

———Substitute larviciding, drainage and breeding area reduction actions for fogging.

Inspection.—Make preventive inspection of waterfront structures to detect earliest marine organism attack before incidence of heavy damage.

Training.—Apply herbicides with trained and certified pest control personnel to assure selection and use of proper chemicals to protect beneficial vegetation and wildlife.

D–4. Refuse Collection and Disposal

Frequency.—Reduce pick-up frequency where excessive.

Grinders.—Use garbage grinders to reduce collection costs where economically feasible and where treatment plant operations will not be adversely affected.

Incinerators.—Use sanitary land fill in lieu of incineration for refuse disposal wherever feasible and economical.

Sale.—Dispose of or sell refuse and edible garbage by contract where this is less expensive than in-house disposal.

Stations.—Establish common refuse pick-up points for family housing.

———Reduce number of pick-up stations to reduce costs.

Vehicles.—Use modern multiple-container refuse equipment utilizing hoist-haul units or front end loading and compaction units to provide the most economical service and to reduce collection costs.

E–1. Administration and Management

ADP—Use automatic data processing equipment to reduce overhead.
Contracts—Use contracts in place of work by in-house forces where lower costs will result.

———Renegotiate maintenance contracts.

———Execute joint contracts with adjacent installations to reduce costs for such services as refuse collection.

———Reduce scope of contracts for maintenance and repair.

———Use commercially available items where such items can be procured at less cost than by in-house fabrication.

———Convert cost-plus-fixed-fee contracts to incentive price contracts where possible.

Data—Standardize typical construction features and specifications, place on reproducible sheets and file for ready reference.

———Institute regular analyses of data and reports to determine areas where efficiency can be increased.

———A&E to send in specifications on stencils ready for reproduction.

Estimates—Use rough estimates instead of final estimates on work that may not be funded to reduce costs to the minimum.

Manpower—Decrease onboard strength by rescheduling working hours and combining Work Centers.

———Reduce overtime expenditures by shift and work assignment changes, daily review of overtime and increasing onboard personnel.

———Use overtime in lieu of holiday, night, weekend shifts.

Materials—Substitute low cost materials on funded projects where maintenance costs will not be increased and desired results can be obtained.

Organizations—Combine real property maintenance and repair organizations at two or more installations (Post Engineer, Public Works,

Base Civil Engineer, Base Maintenance) to reduce overhead and equipment requirements.

———Utilize regional engineering offices to reduce requirement for large installation staffs.

Scope—Forward projects to next higher headquarters for permission to change scope when insights appear to permit an adequate facility at a lower cost.

Standards—Use work performance time standards to increase productivity.

———Apply work sampling techniques to disclose areas where improvements in operation may be possible and to measure productivity of the work force.

———Use standard plans and specifications to the maximum extent possible.

———Use appropriate staffing guides for installation engineering offices to determine proper staffing levels.

Transportation—Improve transportation availability to reduce lost time of workmen.

———Move gas pump to shops area to cut delay times.

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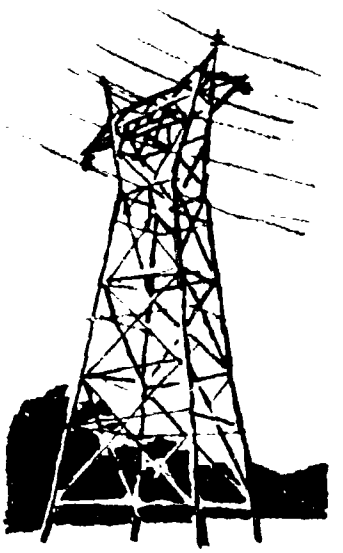
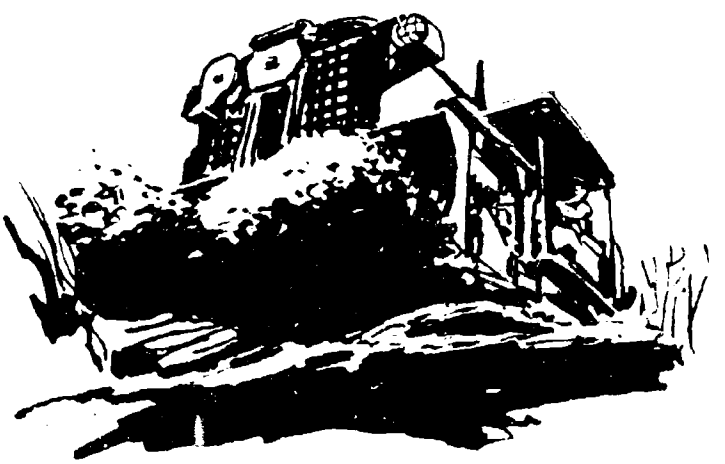
XIII.

Real Property Management

a. Operation of Utilities
b. Maintenance of Real Property
c. Minor Construction
d. Other Engineering Support Systems





Real Property Maintenance and Operation Management

This area encompasses the maintenance, repair and operation aspects of all real property except that included in the Military Family Housing Program. Savings in the Military Construction Program not reported elsewhere are included.

The objective is to initiate management improvement actions which will lower maintenance, repair and operation costs of real property owned or maintained by the DoD. The tasks are to:

- Analyze and evaluate procedures and techniques currently utilized in the management of operation and maintenance of real property facilities activities, with a view toward improvement to accomplish necessary work to prevent deterioration of real property facilities and to support the basic missions of the DoD Components at the lowest possible cost.
- Analyze operation and maintenance of real property facilities activities to determine areas responsible for high costs, and to program studies aimed at reducing operation and maintenance costs in these areas by development of improved procedures.

The goal in the real property maintenance area is to improve the efficiency of the maintenance and operation effort and thereby realize savings which can be utilized for the accomplishment of unfunded work. The reductions in cost accomplished through management improvements in this area are applied against the backlog of essential maintenance and repair, rising costs of labor and materials, and the increasing real property inventory. Typical management actions are those which result in lower utility rates, adapting modern methods and techniques to improve labor performance, and consolidation and simplification of the maintenance and operation functions to reduce manpower, material and equipment requirements.

A. Operation of Utilities

A–1. Electrical

Capacitors.—Use static capacitors on circuits to improve power factor.

Conservation.—Enforce electrical conservation to eliminate waste.

Lamps.—Survey requirements to eliminate over-sized lamps and over-lighted areas.

———Develop cyclic relamping programs to avoid spot replacements of light bulbs (particularly where replacement involves industrial facilities or the use of specialized equipment).

Load.—Schedule heavy loads for off-peak hours to reduce peak demand charges.

———Conduct transformer load surveys to permit reduction in transformer capacity by combining loads of adjacent transformers and de-energizing unneeded transformers.

———Investigate feasibility of installing load control devices to disconnect appliances at hours of system peak where large housing areas are equipped with electric water heaters and/or clothes dryers (so as to improve load factor and reduce billing demand).

Meters.—Reduce or consolidate existing metering points.

———Purchase privately owned electrical systems on the installation to reduce metering points.

Rates.—Renegotiate more favorable rates in unit cost or in peak demand charges.

———Purchase power from other contiguous government agencies.

A–2. Heating

Condensate.—Conduct surveys to determine economics of returning condensate to boiler versus wasting condensate.

Conservation.—Enforce heat conservation to eliminate waste.

Controls.—Eliminate overheating by use of automatic thermostatic controls to shut off heat when not required.

———Install automatic controls on boilers and heating plants to reduce personnel requirements.

———Increase boiler plant efficiency by improved procedures or controls.

———Install surveillance systems to monitor operation of small or isolated plants.

Corrosion.—Utilize corrosion test rings in condensate return lines to assure boiler water treatment for condensate line protection so that maximum life expectancy can be obtained from installed lines.

Fuel.—Use interruptible gas services with standby fuels where lower costs can be achieved commensurate with construction costs for standby fuel equipment.

———Convert boiler and heating plants to use more economical fuels where costs of conversion will be amortized by savings within the guidlines established by DoD.

———Conduct an economic study to determine whether the cost of purchased bottled gas is less than the cost of in-house recharging.

———Conduct an economic study to determine whether costs of delivering fuel oil to points of use by contractor is more economical than delivery to bulk storage and distribution to points of use by post personnel.

———Reduce fuel costs for assuring that premium fuel are not requisitioned unless fully justified.

———Review delivery schedules and solid fuel handling practices to reduce or eliminate double handling.

———Obtain competitive bids for LP gas.

Inspection.—Use roving operators to check small multiple plants instead of using full-time operators.

———Check heating systems for excessive blowdown, improper venting, and improper use of steam or hot water from primary circuits.

Insulation.—Conduct surveys to determine economic feasibility of piping or building insulation to reduce heat loss.

Leaks.—Conduct leak surveys on gas distribution systems to determine repair requirements and keep gas losses to a minimum.

Load.—Cross connect boiler plants to permit serving of load from one plant where economically feasible.

Maintenance.—Modify heating plant equipment to eliminate recurring maintenance and repair problems.

A–3. Water and Sewage Systems

Water

Chemiuals.—Use standard chemicals for water treatment rather than high cost brand name items.

———Use untreated water for flushing and other purposes where desired results can be obtained.

Conservation.—Enforce water conservation.

Controls.—Install automatic equipment or remote controls to reduce operating costs.

Faucets.—Install automatic closing faucets and similar devices to reduce water wastage.

Flushing.—Eliminate continuous flushing devices to reduce use of water.

Leaks.—Conduct leak surveys to eliminate loss in distribution systems.

Rates.—Negotiate lower purchased-water rates.

Sewage

Automate.—Install automatic controls or remote control for plants and pumps where feasible.

Drainage.—Eliminate inflow of storm drainage to reduce treatment costs.

Rates.—Where feasible, contract sewage disposal through municipal systems in lieu of operating installation plant.

———Negotiate lower purchased sewage disposal rates.

A–4. Air Conditioning and Refrigeration

Automate.—Provide necessary controls on outside air intake to allow cooling with outdoor air when climatic conditions permit, thereby saving the cost of operating the air conditioning plant.

———Install automatic control and alarm equipment to reduce personnel requirements.

———Install automatic door closers and similar control devices to reduce loss of refrigerated air in cold storage plants.

Condensers.—Recirculate condensing water used for air conditioning and refrigeration equipment in lieu of wasting it.

———Use air-cooled condensers where economically justified.

Equipment.—Replace small air conditioning units with central units to reduce operation and maintenance costs where costs can be amortized by savings.

———Give consideration to use of a filter cleaning plant where a large quantity of reusable filters are in use at a base.

Oucupancy.—Close down air conditioning systems during periods of little or no occupancy of buldings.

Overcooling.—Place air conditioning systems in a standby position as soon as the season permits.

A–5. Other

Corrosion.—Install cathodic protection on underground utility lines where studies indicate savings will result by extending useful life.

B. Maintenance of Real Property

B–1. Buildings and Systems

Materials.—Use materials which result in lower overall maintenance costs, such as paint with a longer life.

———Purchase materials in larger quantities or bulk to reduce unit cost.

———Use surplus materials or equipment to reduce in-house repair or contract cost when maintenance will not be increased and desired results can be obtained.

Occupants.—Consolidate personnel and activities to the maximum so that buildings can be vacated, thereby reducing utilities and maintenance costs.

———Institute self-help program by occupants to reduce maintenance costs.

———Hold occupants liable for damage and deterioration beyond fair wear and tear to reduce maintenance costs.

Schedules.—Lower the level of maintenance to reduce costs, e.g. frequency of interior painting.

———Lease out unused facilities.

B–2. Utility Systems

Automate.—Automate equipment and/or systems to reduce man-power requirements.

Quality.—Perform maintenance and use materials commensurate with realistic program requirements so as to avoid over or under maintaining.

Schedules.—Program maintenance, repair and replacement work during off peaks and seasons to minimize service interruptions.

B–3. Other Facilities

Automate.—Install labor saving controls/devices in those facilities where economically justified.

Quality.—Utilize improved maintenance and repair materials to reduce recurring maintenance needs.

Schedules.—Review repair and maintenance performed at little used facilities to avoid overmaintaining.

B–4. Pavements

Excess.—Eliminate pavement maintenance where excess pavements are being used for unessential activities.

Patching.—Utilize patching to the maximum in lieu of more costly overlays.

Seals.—Establish sealcoating cycles to reduce long-range maintenance costs.

———Establish crack sealing program to prevent major damage to pavement.

Sweepers.—Use sweepers and magnets to reduce damage by foreign objects to tires and jet engines.

Traffic.—Establish necessary controls and zoning to insure proper use of rev-up areas, taxi lanes, fueling areas and maintenance areas to reduce pavement damage to the minimum.

B–5. Land (Grounds)

Forestry.—Increase yield of forestry products by woodland management so that revenue gained can be used to reduce overall costs of woodland maintenance.

———Sell timber before outleasing property.

Mechanize.—Increase efficiency of grounds maintenance personnel by use of labor saving equipment such as gang mowers and large tractor-drawn rotary mowers.

Outlease.—Outlease Government property, including agricultural and grazing areas, to reduce costs of maintenance and repair, utilities, vegetation control, drainage maintenance, and erosion control.

Vegetation.—Utilize chemicals to kill or retard vegetation growth where this will result in lowered costs.

———Eliminate overgrown or unneeded trees, shrubs, vines and hedges which require excessive maintenance.

Watersheds.—Establish procedures for control and protection of watersheds to prevent erosion.

B–6. R.R. Trackage

Excess.—Place unneeded trackage in a standby status with minimum maintenance to reduce costs.

C. Minor Construction

Goals.—Establish targets to reduce expenditures for alterations and minor construction.

Review.—Establish a review procedure for work submitted to eliminate unessential alteration and minor construction work.

D. Other Engineering Support Services

D–1. Fire Protection

Alarms.—Eliminate unnecessary manual fire alarm boxes and fire reporting telephones.

Extinguishers.—Eliminate unnecessary fire extinguishers.

———Reduce total number of fire extinguishers by omitting them from dead storage and seldom entered buildings where it is prudent to do so. (Work crews entering such building should carry an adequate supply of the appropriate type of fire extinguishers along with their other working tools.)

Manpower.—Eliminate or reduce strength of fire companies were protection from local civilian or other military fire departments is available.

———Reduce size and number of fire companies where risks have been reduced by use of noncombustible or fire resistive construction, dispersal, or by installation of automatic sprinklers and similar equipment.

———Use fire department personnel to answer non-fire emergency calls after normal duty hours and on week-ends (when workload studies show the time to be available) to reduce requirement for full-time non-fire emergency personnel.

Vehicles.—Use standby fire trucks jointly with neighboring installations to reduce the number of standby vehicles.

D–2. Custodial Services

Contract.—Use contracts where service can be performed at a lower cost than by use of in-house forces.

Mechanize.—Increase productivity of workers by use of mechanical equipment and improved work methods.

Scope.—Perform custodial services only for those activities authorized this service.

———Limit services to minimum required to provide for essential sanitation and cleanliness.

D–3. Entomology Services

Detection.—Establish preventive measures for the detection and treatment of incipient termite infestations in existing structures to prevent serious structural damage.

Materials.—Utilize chemically treated lumber and other forest products for protection from wood destroying insects and fungi.

Modernization.—Reduce personnel requirements by use of modern equipment or better programming.

Methods.—Select the most economical and effective methods of mosquito and similar biting insect control.

———Substitute larviciding, drainage and breeding area reduction actions for fogging.

Inspection.—Make preventive inspection of waterfront structures to detect earliest marine organism attack before incidence of heavy damage.

Training.—Apply Herbicides with trained and certified pest control personnel to assure selection and use of proper chemicals to protect beneficial vegetation and wildlife.

D–4. Refuse Collection and Disposal

Frequency.—Reduce pick-up frequency where excessive.

Grinders.—Use garbage grinders to reduce collection costs where economically feasible and where treatment plant operations will not be adversely affected.

Incinerators.—Use sanitary land fill in lieu of incineration for refuse disposal wherever feasible and economical.

Refuse Containers.—Instead of trash/garbage cans use 30 gallon impregnated paper bags made for this purpose.

Sale.—Dispose of or sell refuse and edible garbage by contract where this is less expensive than in-house disposal.

Stations.—Establish common refuse pick-up points for family housing.

———Reduce number of pick-up stations to reduce costs.

Vehicles.—Use modern multiple-container refuse equipment utilizing hoist-haul units or front end loading and compaction units to provide the most economical service and to reduce collection costs.

D–5. Administration and Management

ADP—Use automatic data processing equipment to reduce overhead.

Contracts—Use contracts in place of work by in-house forces where lower costs will result.

———Renegotiate maintenance contracts.

———Execute joint contracts with adjacent installations to reduce costs for such services as refuse collection.

———Reduce scope of contracts for maintenance and repair.

———Use commercially available items where such items can be procured at less cost than by in-house fabrication.

———Convert cost-plus fixed-fee contracts to incentive price contracts where possible.

Data—Standardize typical construction features and specifications, place on reproducible sheets and file for ready reference.

———Institute regular analyses of data and reports to determine areas where efficiency can be increased.

———A&E to send in specifications on stencils ready for reproduction.

Estimates—Use rough estimates instead of final estimates on work that may not be funded to reduce costs to the minimum.

Manpower—Decrease onboard strength by rescheduling working hours and combining Work Centers.

———Reduce overtime expenditures by shift and work assignment changes, daily review of overtime and increasing onboard personnel.

———Use overtime in lieu of holiday, night, weekend shifts.

Materials—Substitute low cost materials on funded projects where maintenance costs will not be increased and desired results can be obtained.

Organizations—Combine real property maintenance and repair organizations at two or more installations (Post Engineer, Public Works, Base Civil Engineer, Base Maintenance) to reduce overhead and equipment requirements.

———Utilize regional engineering offices to reduce requirement for large installation staffs.

Scope—Forward projects to next higher headquarters for permission to change scope when insights appear to permit an adequate facility at a lower cost.

Standards—Use work performance time standards to increase productivity.

———Apply work sampling techniques to disclose areas where improvements in operation may be possible and to measure productivity of the work force.

———Use standard plans and specifications to the maximum extent possible.

———Use appropriate staffing guides for installation engineering offices to determine proper staffing levels.

Transportation—Improve transportation availability to reduce lost time of workmen.

———Move gas pump to shops area to cut delay times.

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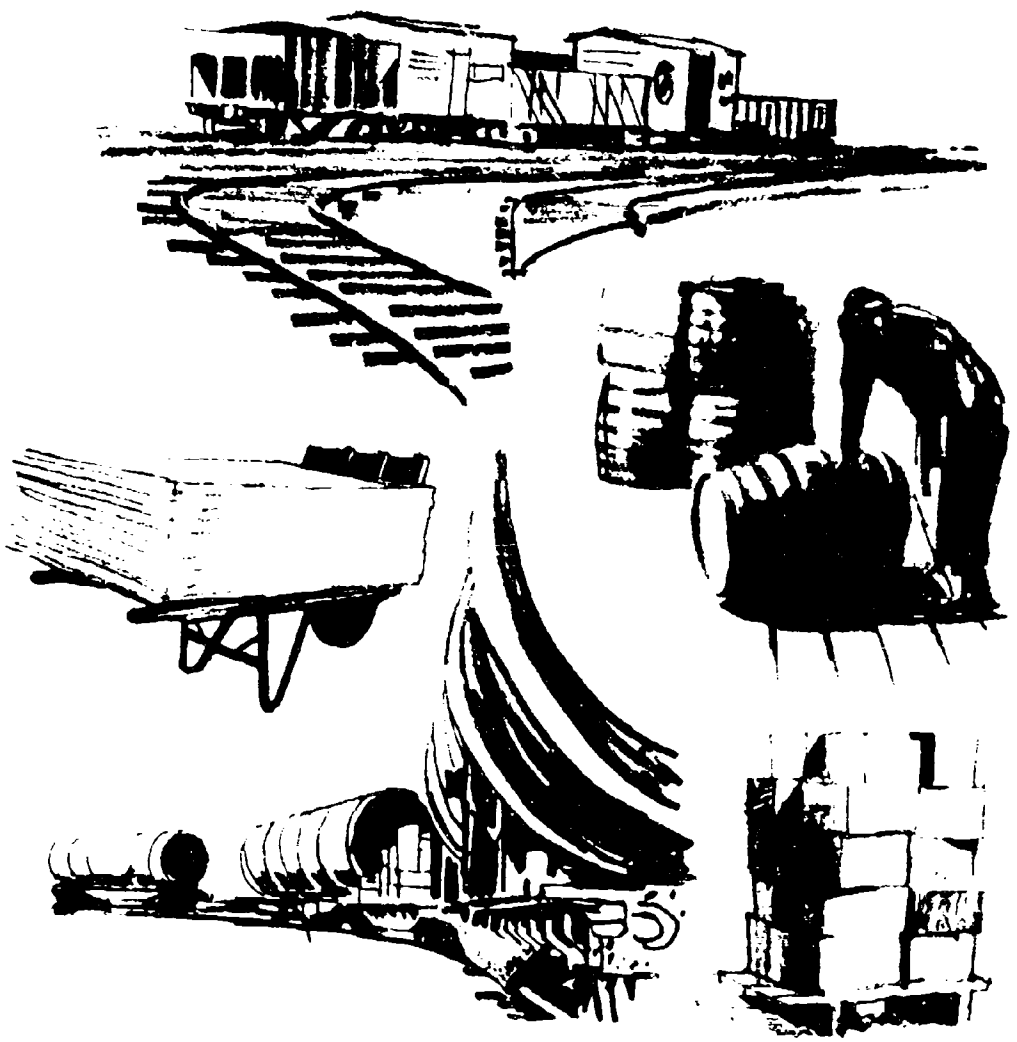
XIV.

Packaging, Preservation and Packing

a. Organization
b. Reduce Operating Costs
c. Increase Efficiency of Operations
d. Selection of Materials
e. Levels of Protection
f. Utilization



Packaging, Preservation and Packing

Defense material is preserved, packaged, and packed to the extent required to prevent deterioration and damage during shipment, handling, and storage. Every effort is exerted to assure that this material receives this protection at the lowest cost.

Savings in this cost reduction area are achieved by:

1. Improving specifications.
2. Improving procedures and methods.
3. Re-using shipping containers and packaging materials.
4. Changing shipping container design to decrease the cost of transportation.

Some of the more significant actions taken in this area over the past several years have been: (1) reducing the level of pack on air shipments for Southeast Asia, (2) using salvage ships in lieu of MSTS ships to dispose of unserviceable ammunition, (3) redesigning the packaging used for Bomb Fin Assemblies, and (4) using a new data system for selecting the type of pack to be used.

A. Organization

Procedures.—Designate one person to review packaging procedures and methods, including coordination between packaging and related activities.

Supervision.—Maintain continuing management supervision of packaging methods and levels to assure that advantage is taken of every opportunity to reduce costs as they apply to particular shipments.

Supervision.—Develop and maintain continuing interest of personnel to suggest better methods and materials.

Training.—Train personnel to consider the known conditions for each shipment. Avoid the "shot-gun" approach (e.g., all shipments going to X country will be packed in plywood boxes).

Training.—Train personnel to consistently question the current practices, methods, and materials used for packaging, preservation and packing.

Waivers.—Request waivers when it is determined shipments can be made with reduced requirements.

B. Reduce Operating Costs

Contractor Service.—Evaluate contractor packaging operations to determine if greater efficiency would result in reduced costs.

Disassembly.—Consider partial disassembly of projecting parts where such removal will reduce overall cube of pack.

Dual Purpose.—Design modular container sizes to improve stacking and cube utilization.

Dual Purpose.—Design containers for large volume fast moving items so that the container itself may be opened and placed on a storage rack to serve as a bin opening rather than transfer the commodity from a packing container to a bin.

Large Items.—Determine whether large items can be moved more economically by special carrier service unpacked rather than by normal transportation requiring an outside pack.

Management.—Develop a continuing program to evaluate and update packaging requirements.

Modification.—Determine if a packing container in stock can be modified to meet new requirements.

Reutilization.—Design containers using materials that can be generally reused by the receiver for other shipments or other purposes when practical. (This is not intended to apply to reusable containers for shipping the same items such as reusable metal containers for aircraft engines.)

Reutilization.—Reuse boxes, crates, etc., and other packaging materials when available.

Specialized Service.—Compare vendor packaging costs with costs available from specialized packaging service contractors to determine lowest cost.

Specifications.—Review packaging specifications in contracts to determine if a more economical specification would meet the requirements, or if the level of packaging, preservation or packing could be reduced.

———Determine if packaging specifications for new items can be more economically developed in-house rather than by vendor.

———Use packaging cost standards to determine reasonable packaging costs for negotiating packaging costs with contractors.

Substitutes.—Determine if aircraft engines or other items could be mounted on skids or trailers with a waterproof covering in lieu of metal containers.

Transportation.—Evaluate material and manpower costs involved in disassembly, packing aand crating by the shipper and uncrating, reassembly and testing by the receiver to determine whether these costs would be reduced by shipping the assembled item by special transportation such as van or barge.

Weight and Cube.—Design containers to provide minimum weight and cube displacement.

———Redesign existing containers and review methods to eliminate excessive tare weight and cube.

———Increase the condition of small shipments into larger containers to reduce the number of containers that need to be rehandled in the process of distribution.

C. Increase Efficiency of Operations

Data.—Standardize and mechanize packaging data for decision-making by procurement officers.

Consolidation.—Consolidate packaging operations to the extent possible.

Equipment.—Continually evaluate packaging equipment and tools to assure the greatest feasible degree of modernization.

Location.—Locate packaging lines to in-line-flow of material received and shipped.

Make vs Buy.—Continually review manufacturing of containers at the installation level to determine if procurement from commercial sources is more economical.

Movement.—Streamline movement of materials through the packaging area.

Reutilization.—Apply instructions on containers on how to open without damaging container in order to increase reusability of container and packing materials.

———Designate a single person to continually review receiving operations for the purpose of selecting packing boxes and material that can be reused by the packing operations.

D. Selection of Materials

Mechanize.—Determine if the volume of fiberboard boxes made at the installation would justify installing a carton making machine.

Reutilization.—Reuse cushioning materials, pallets, blocking, bracing etc., from incoming shipments in lieu of new materials.

Substitutes.—Explore the use of C-D grade lumber and plywood in the manufacture of wood boxes in lieu of A-C grade lumber.

Substitutes.—Establish a continuing program to evaluate and adopt new and alternate, less costly materials.

Weight.—Use fiberboard and other light weight packing materials when they meet requirements in lieu of heavier, more expensive materials even though these may also meet the requirement.

E. Levels of Protection

Minimum.—Use the minimum level of protection that will meet the requirement of the particular shipment.

Program.—Establish a continuing program to evaluate the possibility of reducing levels of protection for particular shipments when conditions warrant.

Storage and Handling.—Make particular efforts on a continuing basis to determine storage and handling conditions in consignee area as a basis for reducing levels of protection.

F. Utilization

Packs.—Determine the extent to which packaging, preservation and packing requirements may be reduced when shipments are moving in van size containers.

Packs.—Determine before shipments are packed whether they are going by either van sized containers, or by air, in order to reduce packaging, preservation and packing requirements.

Packs.—Use domestic (level C) packs for overseas shipments that move by van size containers when the supplies will be stored in warehouses upon arrival at destination on when they are going into immediate use.

Pallets.—Unitize cargo on pallets or skids whenever feasible to reduce packaging, preservation and packing requirements.

Pallets.—Avoid the use of palletized or skid loads for cargo being shipped in van sized containers wherever possible.

Van Size Containers.—Utilize van size containers for appropriate cargo where this service is available.

Packaging, Preservation and Packing

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