CONCURRENT SPARE PARTS: THE CORNERSTONE OF SUPPLY SUPPORT

By

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From the point of view of the logistician, one of the most important lines on any system sales case is that which provides the concurrent spare parts (CSP). While newspaper headlines are filled with references to high performance aircraft, expensive missiles, or speedy patrol craft, there is little public attention given to the more mundane aspects of logistics support. This lack of press coverage means little to those who are concerned with the support of the headline-grabbing weapons, since it is clear that without spare parts and all other elements of logistical support, the photogenic planes zipping through the clouds, or the ships plowing through the seas rapidly degrade to the point of becoming museum exhibits. CSP, providing a small supply system of required parts, is a significant step in the life cycle support of any weapons system.

Responsibility for determining the range and depth of spares falls to the system support inventory control points, i.e., the Army Material Readiness Commands (MRC), the Navy Inventory Control Points (ICP) and the Air Force Air Logistics Centers (ALC). When a system is procured for U.S. military use, it is necessary to provision the weapon system, that is, to decide which spare parts will be required to maintain the system. The following concepts are among those to be considered in selecting the optimum equipment support.

Clearly, for a weapon system to be of value, it must be combat-ready as much of the time as possible. As a measure of reliability, we look at the failure rate of each of the constituent parts of the weapon system, or, in simple terms, how often an item breaks down and requires replacement or repair. This information in turn influences the type and quantity of items placed on the initial provisioning list. The selection of parts must be aimed at reducing downtime in order that the weapon system can perform its designated mission in the most cost-effective manner.

If an item has failed, it must be determined whether the item can be restored to an operable condition or if the cost of the component, when compared to the maintenance labor costs to repair it, will dictate that the component itself be disposed and replaced in its entirety.

In making these support decisions, economy can often be an overriding factor. We must consider not just the cost of the material, but also labor costs for making the repairs and the cost of not having the weapon system available while repairs are being made. The lowest cost of parts may not necessarily be the most economical cost. Standardization and interchangeability also enter into the economics equation. Inventory costs and support difficulties may be avoided by selecting parts common to systems currently being used.

Once it is determined that an equipment or component can be repaired, it must be determined at which level in the maintenance organization the repair will be made. Three usual levels of repair are considered: organizational that is done by the using organization, i.e., company, squadron, or shipboard levels; intermediate usually at an echelon above and supporting the organizational level, but still operating in the field, such as base, battalion, station or division levels; and depot level maintenance, usually performed in a military department depot or a contractor's plant. The decision to repair at the organizational, intermediate or depot level is made by considering the probable technical skills of the personnel at each level, and the investment in special tools, test equipment, facilities or handling devices which may be required, and what problems in physical access to the equipment may be encountered.

Since having unlimited funds to secure items of support is not usually the case, it is necessary to allocate available resources on the basis of military essentiality of the part to the equipment, and the equipment to the system as a whole. Obviously, the failure of some parts or equipments will prevent a weapon system from performing its total mission, while failure in back-up or auxiliary equipments may not be so catastrophic. Funds will usually be applied to those items whose failure will have the most significant impact on the military mission.

While provisioning is accomplished during the introduction of the weapon to active forces, the decisions which are made are not static but must continually be revised through maintenance data collection systems in order that the theoretical calculations made prior to daily use of the weapon reflect actual maintenance requirements. It is this updated provisioning data base, then, that provides the basis for computing the desired CSP. In determining spare parts requirements, these data reflect consumption based on the number of flying or operating hours or simply historical or projected number of failures for a given length of time. In order to compute a purchasing country's CSP, these variables must be agreed upon by both purchaser and the material command preparing the listing.

U.S. Army CSP requirements are prepared at the Material Readiness Commands for a one-year period (although longer support periods can be requested) and correspond to the direct/general support levels. The proposed listing is provided to USASAC, New Cumberland, PA, which in turn forwards the list to the purchaser for review and any desired modifications. Once the purchaser has accepted the listing, it is returned to USASAC where the requisitions are prepared and entered into the supply system. Army CSP push requisitions are identified by A, B, or C in the first position of the requisition serial number (card column 40 of the MILSTRIP format).

In the Navy, CSP for shipboard equipment are provided in two sets -- one 90-day organizational level set for shipboard use and the other a two-year depot level shorebased load. In the first instance, the CSP represents the standard Coordinated Shipboard Allowance List (COSAL) and in the latter the Coordinated Shorebased Material Allowance List (COSMAL). These COSAL and COSMAL documents are provided to the customer to establish an allowance list for the items. Aviation equipment in the Navy is supported by a Gross Requirements List (GRL). This normally represents two-year, in-country depot level spares. Unlike the COSMAL, the GRL is

provided to the customer for his review prior to creating the requisitions. Also, long lead-time items may be procured in advance of the GRL. In this case, these items must be subtracted from the published GRL to avoid duplicate requisitions. In the case of both the COSAL/COSMAL and GRL, the requisitions are prepared by the ICP in a skeletonized format and forwarded to NAVILCO, Philadelphia, PA, where additional information is added to them and the requisition is released into the supply system.

The U.S. Air Force first negotiates with the purchaser as to whether the CSP will be only organizational level spares or whether intermediate level material will also be included. The systems manager at an Air Logistics Center (ALC) prepares the CSP listing, usually for 24 months, although other support periods may be agreed upon. This recommended list of items and quantities is the basis for discussion at the definitization conference where the customer can review and modify the recommendations. After definitization, the system manager prepares the requisitions and enters them into the supply system.

In anticipation of the arrival of the material itself, the purchaser has a variety of tasks which must be accomplished, if worry-free logistics is to result. The receipt of major items usually means simply turning them over to operational personnel; however, the receipt of CSP is only the first step in a long-term logistical effort. Without adequate preparation, the initial step may be a fiasco and have a lasting ruinous effect on spare part support.

First, there must be adequate storage facilities. While most recipients have warehouses, the task of receiving and storing perhaps tens of thousands of line items for a major system should not be underestimated. A building itself is not enough, and there must be sufficient, appropriately-sized storage locations to provide adequate protection and enable the warehouseman to find the items with some facility. Because many spare parts are quite small, drawers or small bins are often necessary, since hundreds of tiny parts stored on large racks may minimize storage locations but is conducive to loss. Some sort of locator system is also required so that the location can be easily entered on the stock records.

After adequate facilities are arranged, trained personnel must be found who have a variety of supply skills. Knowledge of MILSTRIP is a must for the receiving clerks who must cope with thousands of in-coming requisitions with the possibility of large numbers of partial requisitions, substitute items, and incorrect items being supplied. Other personnel must be familiar with inventory control procedures as the material is taken up in stock and then issued out for maintenance actions. Even though supply personnel may be trained in local systems, new formats of stock numbers and reliance on the U.S. for resupply may still dictate changes in supply techniques, and, of course, additional specialized training. In planning a security assistance training program, one should not neglect the training of logistic support personnel in spite of the fact that they are not as obviously in need of training as are the weapons operators.

Since CSP are supplied in order to be used, it is clear that the introduction of a weapon system will rapidly mean equipment failures and the need to issue these spare parts. It is perhaps not so clear that there must be some mechanism available from the beginning to replace CSP issued. Even

though up to 24 months worth of spares are provided with a system, it must be realized that the quantities represent a mathematical computation of how many parts will fail during that period of time. For many insurance items, even 24 months worth of expected demands is only a single item. Once that item is drawn from stock, prudent supply policy says it must be replaced. Thus, for that item, two years worth of stock may be used up on the first day of equipment operation. Without having a method for replenishing CSP from the beginning, the purchaser runs the risk of a severely degraded supply system. Of course, one type of needed replenishment system may be that for reparable items which must be returned to the U.S. for depot level repairs. Since the repair of reparables requires a more involved program of packaging, return transportation, and customs clearances, this whole system demands special attention.

The calculation of CSP is made according to the best available estimating technique. However, it must be realized that actual spare parts usage is always going to deviate from this projection. Such things as operating environment, operating schedules, and maintenance techniques will cause variance in the calculations made by the U.S. material commands. Therefore, the purchaser must have some method to adjust this initial load of spares to accommodate his actual requirements. Under no circumstances should this CSP package be looked upon as a static load list which must always be adhered to. It is only a starting point for the refinements which will then define a functioning logistics support system.

In reality, then, the arrival of CSP is not simply having more material to deal with. The possibility of thousands of line items of spares does mean this, of course, but it also should signify the beginning of a fully operational supply support system. Logistics planners from the U.S. as well as from the purchasing country should pay attention to this significant milestone as essential in a lifetime of good logistical support.

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