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Tailoring Allowance Documents for FMS Customers

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A key ingredient for quality initial and follow-on supply support for a newly acquired or updated weapons system is the allowance document provided for the system. The Navy SPCC in Mechanicsburg PA, is responsible for providing allowance documents to foreign customers for their ships, submarines, and missile systems.

The "basic" allowance document produced for naval FMS customers as well as U.S. Navy ships, is the Coordinated Shipboard Allowance List or "COSAL". This is the shipboard maintenance and supply document listing both installed equipment and supporting piece parts for the ship. The COSAL assists the shipboard technician in identifying and ordering parts either out of ships stock, or from the shore establishment. It also identifies the special tools and test

equipment authorized for preventive and corrective maintenance to maximize self-sufficiency during extended periods at sea.

The Coordinated Shore-based Material Allowance Listing or "COSMAL" is the allowance document which provides backup stockage levels ashore for resupply to the ships in the foreign navy, and provides either direct or re-supply support to in-country maintenance activities. In effect it is an intermediate level of stock between the shipboard COSAL allowance, the maintenance activities, and the U.S. supply system. Typically COSMAL allowances are "folded into" the country' s own stockage levels at the waterfront Naval Supply Center.

There are currently four models in use at SPCC for the production of the COSAL document. The "standard" model, which is used for most U.S. ships as well as foreign customers, is the Fleet Logistics Support Improvement Program or FLSIP model, or its enhanced version "MOD-FLSIP".

The FLSIP and MOD-FLSIP models are fixed protection models which, as tailored to U.S. requirements, attempt to provide a 90 percent protection level against a stockout for a 90 day period. The FLSIP allowance computation process is essentially a six step process. First, all maintenance significant repair parts which can be removed and replaced by shipboard personnel, for all installed equipment, are considered as allowance candidates. Second, the number of times each part appears in each system is multiplied by the total quantity of systems installed to obtain the parts total population. Third, each part's population is multiplied by its best replacement factor (BRF). The BRF is a given numerical value which is based on the expectation that an item will be replaced either in planned maintenance or as a result of random failure. The BRF is expressed as a function of one calendar year. In other words, a BRF of 2.0 indicates that the item would be expected to fail twice a year, a BRF of .2 once every five years, and so forth. Fourth, if the BRF times population computes to at least 4.0, in other words one replacement in 90 days, then the item computes for demand based stockage in at least its minimum replacement unit. Fifth, if the expected usage of an item is greater than one in four years (in other words greater than .25) and less than one replacement in 90 days, the part is stocked as an insurance item, but only if the item is "vital" to the ship as determined by the part's Military Essentiality Coding and Mission Criticality Coding maintained by SPCC. Sixth, planned maintenance requirement items or tailored override requirement items are "forced" into the COSAL in the minimum replacement unit quantities. Under the MOD-FLSIP enhancement, if the item does not qualify for stockage under the standard FLSIP rules, the Item Mission Essentiality Code is considered. If the item is considered essential (code 3 or 4) then the BRF times population cut point is reduced from .25 to .10. In other words if the items has an expected failure of one in ten years, it is stocked as an insurance item. Naturally there is a substantial additional cost associated with this additional range and depth of material.

Recently, in an effort to reduce costs while maintaining effectiveness, SPCC has developed an essentially new model, which we feel will be the key to quality and affordable allowance lists for both the U.S. Navy and foreign customers in the foreseeable future. The new model is called .5 FLSIP Plus. Historically, utilizing the MOD-FLSIP model, the U.S. Navy estimates that a minimum of 75 percent of items stocked aboard ship do not receive a demand between overhauls. SPCC has run six test COSALs and implemented four in the fleet, using the new model. The average value of these COSALS has been reduced 24 percent from the standard, the number of line items reduced an average of approximately 18 percent, while generally less than plus or minus 1 percent change in effectiveness has been experienced. The model was approved for fleet use by the Chief of Naval Operations in March of this year.

Like FLSIP the new model .5 FLSIP Plus uses a Best Replacement Factor times population calculation to establish the allowance candidates for the ships COSAL. The product of these two

variables must be greater than or equal to .5, or one replacement in two years, before the item is considered for stockage. Raising the cut-point to .5 has the effect of excluding a large number of non-movers from allowance lists, substantially reducing the cost. The downside is that if the model were left at this point, roughly a 10 percent loss in effectiveness against the MOD-FLSIP standard would be experienced. This problem is overcome by reinvesting some of the savings derived from raising the cut point. Ship Class demand information from the fleet maintenance data system (3M) and casualty reporting (CASREP) system, for ships with configurations that match as closely as possible that of the ship receiving the COSAL, is utilized to identify "add back" candidates which raise the COSAL effectiveness at a moderate cost. The essence of this methodology is its recognition of actual demand, and its lack of total reliance upon theoretical replacement factors. The result is an effective "tailored" COSAL with a modest investment cost. SPCC is now ready to utilize this model in producing COSALs for our international customers.

The COSMAL, which provides resupply support ashore for the ship's COSAL and the supporting maintenance activities, can also be tailored to meet specific customer needs. Parameters can be adjusted to affect the range, depth, and value of the COSMAL stockage recommendations. First, an accurate assessment of the in-country maintenance capability must be obtained. Depot, intermediate, and organizational level facilities each require different ranges of spare parts, and the COSMAL is tailored to meet the appropriate maintenance level. Second, a support period must be selected. Most foreign customers select a two year support period, but COSMALs have been produced for customers with five year support, and the capability exists to produce up to twenty-five year support period COSMALs. Third, for items predicted to fail less than once during the selected support period, a range factor can be applied. As this factor is increased, more items are considered for stockage than would normally be the case (these are essentially insurance items). Fourth, for items predicted to fail more than once during the selected support period a depth factor can be applied; however, the effect on numbers of line items and therefore cost is less pronounced than with the range factor. As the depth factor is increased, the depth of stock of candidate items already considered increases. COSMAL output can be provided in a variety of medium options, including hard copy, floppy disks, or magnetic cartridges.

Historically, very few foreign countries have taken action to update their allowance documents subsequent to initial production. In those instances where the foreign ship receives a new U.S. weapon system, the ship frequently receives a "stand alone" mini-COSAL for that weapon system only. This situation has the drawback that the mini-COSAL is not "integrated" with the ship' s main COSAL, leading to sub-optimization of piece part support for the ship.

The lack of an update system may not have been as great a problem as it would appear, in that the configuration of foreign ships has remained relatively static when compared to the U.S. standard. However, as foreign navies obtain increasingly sophisticated U.S. weapons systems, and more frequently participate as partners in the various U.S. Navy weapons systems upgrade programs, the need to maintain the COSAL and COSMAL up to date in terms of configuration status has become more important.

The U.S. Navy provides COSAL updates to its non-mechanized ships through a process known as the Automated Monthly COSAL Maintenance Action Report or AUTOMCMAR. From the customer's point of view this title is a bit misleading in that while the product is a manual report, it is automated in its production at SPCC. The AUTOMCMAR report computes onboard repair part allowances based on the customer's specific maintenance level, protection period, and sparing model. Use of the AUTOMCMAR process affords the foreign customer the following advantages: when combined with a process to update the SPCC Weapons System File, such as the Configuration Data Accountant system, it allows the customer to receive piece part support for changes in the configuration of the weapons system, and integrates these additional

allowances into the existing allowance document; it provides National Stock Number suppression and replacement information for stock numbers appearing in a given maintenance cycle; it can provide changes in allowance quantities based on significant changes in demand patterns; the product optimizes allowances by providing a consolidated Stock Number Sequence List based on the total population of a given line item within that month's maintenance cycle for the specific ship or shore activity; the process at SPCC allows for direct update of the SPCC Ship's History File providing an accurate record of foreign customer funded allowances resulting from individual ship or shore activity COSAL maintenance, data which would be available at customer request at a later date; and, the process provides for more timely updates of "bald" Allowance Parts Lists found in a new COSAL. These APLs are generally for newly fielded equipments which have not yet been fully provisioned and for which no formal APLs have been published. APLs transitioning to full support are automatically promulgated with the AUTOMCMAR report, allowing customers to more quickly dispense with interim support provided by Allowance Appendix Packages.

In summation, SPCC offers foreign customers a variety of allowance list products tailored to the customer's needs, both in terms of the model used and the parameters set within each model. We are particularly enthusiastic about the possibilities the .5 FLSIP Plus COSAL model offers for effective COSAL support at an affordable price. SPCC is also able to provide tailored updates to allowance lists between allowance list production cycles, allowing the customer to keep his allowance document up to date, and ensuring that his initial investment in supportability is not degraded over time.