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# Best Practices in Developing Proactive Supply Strategies for Air Force Low-Demand Service Parts

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## Summary

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The Air Force uses thousands of parts to maintain its aircraft. While some of these are replaced quite often, most of them, in fact, are needed infrequently. Of nearly 60,000 items the Air Force requisitioned in a recent three-year period, nearly three in four had no more than a half-dozen annual requisitions.

Difficulties in developing effective supply strategies for these “low-demand” parts can cause problems in maintaining aircraft just as problems in purchasing and supply chain management for more frequently used parts can. In fact, the unpredictability of needs for low-demand parts, as well as the difficulties in attaining them from suppliers who find them less lucrative to produce than more commonly used parts, can mean that they pose even more challenges for Air Force operations than do parts with higher demands. Low-demand parts also pose challenges to Air Force purchasing and supply chain management goals, such as those for reducing sourcing cycle time, improving supply material availability, and decreasing material purchase and repair costs, particularly when low-demand parts are used by larger, more expensive parts and assemblies.

To assess how the Air Force could improve its development of supply strategies for low-demand parts, we performed three tasks. First, we reviewed business, academic, and defense literature on best practices for developing supply strategies for low-demand parts. Second, we analyzed spend data on these parts, including some indicators of which low-demand parts may affect mission capability for aircraft or incidents of awaiting parts. Third, we interviewed representatives of

leading commercial firms regarding their best practices for developing supply strategies for these kinds of parts. Below we discuss data on low-demand parts used by the Air Force, best commercial practices for obtaining these parts from private-sector suppliers, and their applicability to the Air Force.

## **Low-Demand Parts in the Air Force**

We defined low-demand parts as those that had no more than six average annual requisitions. In our interviews with commercial companies, we found that frequency of requisition was both the most common criterion for determining whether a part was “low-demand” and the variable of greatest concern to managing “low-demand” issues.

We found that Air Force low-demand parts are concentrated in relatively few classes of goods. Nearly two-thirds are in just five federal supply groups, and nearly one-third are in the federal supply group for electric and electronic equipment components. Air logistics centers rather than Air Force bases are the most frequent users of low-demand items. Nearly one-half of the requisitions for low-demand items originated at the Warner Robins, Oklahoma City, or Ogden Air Logistics Centers. This suggests that much improvement may result from initiatives focused on a select group of items at a small number of locations.

Spend data on low-demand items also indicate some additional commodities warranting attention. Most of the dollars the Air Force spends on low-demand items are for items that are in the same classes as items that consume most of the Air Force’s dollars. For example, engines, turbines, and components form the federal supply group in which the Air Force spends both the most money overall for spare and repair items and the most money for low-demand items. Many leading suppliers of low-demand items are also leading suppliers of all spare and repair items to the Air Force. Of the top ten suppliers to the Air Force, eight are also among the top ten suppliers of low-demand items. This indicates that many of the suppliers with which the Air Force should implement overall supply strategies are the same as those with which it should address supply strategies for low-demand items. The

relatively greater proportion of low-demand items that are currently purchased through purchase orders rather than contracts compared to non-low-demand items indicates that such items are less likely to have supply strategies already in place for them.

Requisition data was used to define low-demand parts as anything that had six or fewer demand occurrences per year. The match rate between the requisition and “mission capable” (MICAP) and awaiting parts (AWP) data was very low, which meant low-demand status of MICAP and AWP parts could not be based on requisition data. To assess the extent to which such supply availability problems for MICAP and AWP parts were attributable to low-demand parts, we considered as low-demand parts insurance (INS) items with no projected demands and nonstockage objective (NSO) items with very low projected demands. We found that of all items associated with MICAP or AWP incidents, one in four were INS or NSO items, and of all MICAP or AWP incidents, about one in fourteen incidents involved an INS or NSO item.

## **Best Practices for Developing Supply Strategies for Low-Demand Items**

Where a product is in its life cycle determines to a large degree the best practices that are available to assure the supply of low-demand parts for it. Our interviewees outlined strategies for ensuring supply during the three life-cycle phases of design, production, and postproduction. The best options for ensuring long-term aftermarket support are best put in place in the earliest stages of a product’s life cycle.

The first, design, phase of a product’s life cycle can offer the most opportunities for minimizing the total number of low-demand parts. Involving buyers and suppliers in the design of new systems, products, and parts can help balance performance and cost objectives while minimizing unique parts to a specific product. Reducing complexity by using common subsystems and parts can also help minimize unique parts and hence the ultimate number of parts that may have only low demands. Monitoring and managing obsolescence through a product’s

life cycle can help avoid the need to replace parts that manufacturers or suppliers might discontinue.

The second, production, phase is the best time to align supplier incentives with goals for long-term support. In fact, buyers' leverage over suppliers peaks just before award of the production contract. Committing suppliers to postproduction aftermarket services in the production contract can help ensure long-term support of low-demand parts throughout the life cycle of a product. Buyers may also want to leverage the production contract award to ensure potential access to technical data for low-demand parts, which can help it develop alternative sources of supply should the original supplier exit the business or prove to be unresponsive.

The third, postproduction, phase offers fewer good options for developing supply strategies. Buyers seeking to ensure supply of low-demand parts may wish to provide incentives for supply of low-demand parts so as to maintain continuity in the supply chain. If a supplier has left the business, buyers may choose to develop a new one. Buyers may also choose to buy a lifetime supply of parts before a supplier exits a business, although it can be difficult to estimate the quantities needed for a "lifetime" supply. Finally, buyers may purchase or retire whole products to cannibalize low-demand (and other) parts on them.

## **Options for the Air Force**

Just as best practices for supply strategies regarding low-demand parts depend on where a product is in its life cycle, so do the options available to the Air Force. In assessing supply strategies for low-demand parts, the Air Force must also consider many conditions that differ from those in the private sector, including the presence of fewer suppliers and hence of alternative sources of supply. We offer the following recommendations.

In the design phase of a product, the Air Force should encourage active participation of sustainment personnel who are able to incorporate reliability and maintainability concerns (see pp. 37–38, 44–45, 58, 60–61, 65, 72). These personnel could work more effectively with acqui-

sition personnel to plan for long-term parts support and help ensure greater consideration for supply chain issues throughout a product's life cycle.

Having the production contract include language that requires the supplier to provide long-term support can help align supplier incentives with Air Force goals and make commitment to them more likely to be honored (see pp. 28–29, 44–45, 58, 64–65, 71–72). The Air Force should work with suppliers to put in place strategies for low-demand parts support during production, when problems are easier to address than they are in postproduction, when lower-tier suppliers may quit the business (see pp. 35–36, 38–39, 45–46, 58, 62, 66–67, 72–73). During production, the Air Force should also seek access or an agreement to possibly access technical data for parts that would help it find alternative sources of supply if necessary after production ends (see pp. 43–44, 48–50, 58, 72).<sup>1</sup>

Air Force options for support and supply strategies following production are limited. The Air Force could analyze its low-demand parts to determine groups of parts that ought to be purchased together to make support of them more attractive to suppliers (see pp. 53–55, 58, 66–69, 73). In some cases, the Air Force may benefit from working with other buyers, such as the Navy or Army, in exercising leverage over suppliers to improve support for low-demand parts (see pp. 52, 67–68, 74).

The Air Force operates many legacy aircraft, which means that most of its fleet is postproduction and thus facing technology obsolescence, diminishing sources of supply and repair, and more low-demand failures than younger fleets. Few systems are still in the preaward phase (e.g., the replacement tanker). However, many subsystems continue to be modernized and upgraded. To the extent that these programs are competed, opportunities exist to apply some of these principles even to legacy aircraft (see pp. 39–42, 58, 61–62, 71, 73–74).

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<sup>1</sup> Total Life Cycle Cost Systems Management, which requires that sustainment costs be considered more explicitly in the production phase of the acquisition of a weapon system, could make the buying of technical data more likely than in the recent past. Programs often reallocate monies earmarked for technical data to cover cost overruns during development and/or production, which essentially derails plans to buy technical data.