Improved End-of-Life Cycle Management

Yesterday's Equipment Conserving Today's Dollars

David Oaks

A visitor to Sierra Army Depot in the summer of 2003 would have been witness to an impressive sight: more than 1,000 ground combat and tactical vehicles neatly parked in the high desert heat. Seven years later, the scene is even more impressive, as the number of vehicles—in various states of readiness—has grown more than eightfold. But the question isn't how did the Army get into this extraordinary situation? The question is how will it get out?

The Army has a range of options for disposing of this equipment in ways that could increase readiness to the current warfighting fleets; enhance support to allied and coalition forces; reduce the burden of corrosion, obsolescence, and storage costs; and return some of the investment funds to the public treasury.

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The combined effects of Army transformation, global repositioning and restationing, modernization, and modularity have displaced significant quantities of tanks, fighting vehicles, artillery systems, tactical trucks, and miscellaneous support equipment from operational forces. Beginning with the drawdown in Europe in the mid-1990s and extending through the current Army modularity efforts and the drawdown from Southwest Asia, many weapons systems have been diverted from operational units.

Without the resources to properly execute demilitarization and disposal, this materiel has made its way into temporary—albeit long-term—storage around the globe (Anniston Army Depot, Red River Army Depot, Kaiserslautern Storage Activity, and Taegu Storage Area), with the most conspicuous collection in California's high desert at Sierra Army Depot.

Much of this materiel is excess to the needs of the Army but not necessarily excess to inventory levels that are driven by authorization formulas and policy mandates. There are procedures for demilitarizing and disposing of equipment through the Defense Logistics Agency's Defense Reutilization and Marketing Service (DRMS).

Unfortunately, Army program managers do not have access to the necessary funding, manpower, policy, or authority to deal with this magnitude of equipment. That leaves the Army without a viable strategy to dispose of its excess displaced materiel—a dilemma that leaders at the highest levels of the Army know they must address.

The U.S. Army TACOM Life Cycle Management Command (formerly Tank–Automotive and Armament Command), the owner of much of the excess equipment, is developing and beginning to implement a strategy that will not only ensure proper disposition, but could also generate revenue to cover the overhead and operational costs.

TACOM-LCMC and Army program managers are partnering to assemble a disposal strategy that is both effective and sustainable. The best approach will most likely come from a tiered strategy that uses several integrated concepts:

- Retention of a "golden fleet"
- Retention of some quantity of platforms that are in a planned state of unreadiness
- Candidates for foreign military sales
- Candidates for disassembly to feed a secondary supply chain
- Residual sales.

This strategy is analogous to how the U.S. Air Force disposes of its displaced aircraft and how commercial enterprises meet their reclamation targets.

Air Force's AMARG

The Air Force's Aerospace Maintenance and Regeneration Group is a good example of an end-of-life-cycle management operation. The AMARG manages more than 4,000 aircraft for joint and allied customers at the Davis-Monthan Air Force Base in the Arizona desert—often referred to as the "Boneyard." While storage is its most publicized activity, AMARG also has three other product divisions: aircraft, commodities, and disposal.

The aircraft division restores airplanes to flying condition for foreign military sales or use as target drones—this is the AMARG's "golden fleet." The aircraft division also feeds parts back to service life extension programs by harvesting significant portions of aircraft, such as a recent effort to recover the center wing boxes of A-10 attack aircraft. The AMARG commodities division salvages, inspects,

and ships aircraft parts. This activity alone generates hundreds of millions of dollars of revenue each year. The disposal division oversees the scrapping of aircraft in excess of pro

Commercial Industry Examples

Private sector practices provide a number of examples of getting use from otherwise useless assets. These commercial innovations for better end-of-life disposal have come about because of increased pressure to recover as much value as possible while complying with environmentally focused regulations.

A recent trend in the end-of-life commercial aircraft market is the recovery of both serviceable parts and reclaimed materials to return more value than simply selling entire aircraft for scrap. Industry experience has proven that taking the time to methodically dismantle aircraft for scrap, from 5 days to about 45 days, can increase the recovery yield by 10 to 20 percent. Technical data from the original manufacturer helps in the identification of important metal alloys and other constituent parts.

The best management practices can result in a 90 to 95 percent recycling of an aircraft by weight. Some estimates put the market for the reclaimed parts (primarily engine parts) at around $2 billion.

Another potentially lucrative area is the reuse of carbon fibers. The reclaimed fibers may not be certified for reuse in aviation components, but they do retain their value for use in less critical applications.

Automobile end-of-life considerations have been pushed by regulatory compliance with higher reclamation targets. British law, for example, mandates recovery of 85 percent of the weight of passenger cars; the European Union has passed a more rigorous law calling for 95 percent recovery of vehicles manufactured after 2015. To meet these goals, companies are designing their vehicles with greater attention to how they can later be dismantled, recycled, or reused. Principle among the design changes are reductions in the sum of hazardous substances, such as lead, cadmium, chromium, or mercury.

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PROPOSAL REQUIRES CHANGES TO CURRENT POLICY

A centralized disposal activity can be self-sustaining, and may even generate revenue. While there are policy and regulatory hurdles that may stand in the way of the Army recovering some of the potential dollars generated, none of these hurdles are insurmountable. Further, mechanisms such as proceed-sharing with the Defense Logistic Agency's disposal and marketing service can add to the attractiveness of the Army's proposal.

Another trend in automobile dismantling is the segregation of the business into two parts: a centralized and specialized wholesale division that provides serviceable parts to repair and body shops, and a retail division from which customers retrieve the parts they need (a traditional strip lot).

Such reclamation examples from industry may help the Army and the Department of Defense further implement environmentally responsible solutions for its systems—from design to disposal.

Vision for Ground System End-of-Life Management

TACOM envisions the Army becoming a joint Service provider for ground system end-of-life-cycle management. Its strategy for end-of-life-cycle management can be self-sustaining given the right policy, authority, and resources.

Dollars could be generated from a variety of activities (including foreign military sales, reclamation of secondary items, salvage, or scrapping) and used to reimburse the Army Working Capital Fund, generating enough revenue to offset LCMC and other TACOM operating costs. Beyond these monetary benefits, there may be other gains. These could range from better equipping solutions for coalition partners and allies and the availability of materiel to support irregular warfare efforts, to a reduction in the uncertainty associated with end-of-life decisions and a flow of information back to manufacturers regarding the design of new items. As an added benefit, the Army and the other Services won't have large quantities of equipment languishing in open lots and consuming increasingly scarce funding for storage, maintenance, and corrosion control.

The starting point is to sort current (and future) items into five logical groups.

The Golden Fleet

Out of its pool of excess materiel, TACOM would identify the best available items in terms of their materiel condition and modernization. These could be restored to the Army Maintenance Standard (TM 10/20) and held at that level of readiness so they can be used for contingency purposes. Items of equipment in this golden fleet would be maintained for a variety of operational purposes—replacements for battle losses,

unforecasted training losses, operational surge requirements, and out-of-cycle equipment fieldings. The golden fleet might consist of several modernized and fully maintained M-1A2 SEP main battle tanks, a complement of M-2A3 infantry fighting vehicles, M-3A3 cavalry fighting vehicles, M-109A6 Paladin artillery systems, and other relevant combat, combat support, and combat service support equipment.

The Unready Pool

TACOM's strategy would deliberately hold a fleet of end items (similar in composition to the golden fleet) in a state of serviceability that is just below the Army's maintenance standard. This equipment would not be ready, but it would be maintained to control corrosion and held in inventory so it could be brought to an acceptable readiness level within a short period to replenish the golden fleet or to meet further contingency requirements. The unready pool might include serviceable secondary items as a hedge against unforeseen requirements.

Foreign Military Sales Candidates

A third pool of equipment would include materiel (both major end items and secondary items) that is available for military sales to qualified international partners. In the past, foreign military sales have been more or less a niche business for the Army. Given the increasing stockpile of warfighting gear, there are increased opportunities to get relevant equipment into the hands of our security partner nations. Equipment in the foreign military sales pool would be kept in an "as-is" condition (similar to the unready pool) or brought to a higher state of readiness, as determined by the requirements of the sale.

Secondary Supply Chain (Salvage)

Among the excesses is equipment that is ready to be disassembled for the value of its parts. These parts would feed numerous supply chains and repair part inventories, including the maintenance of the golden fleet, field-level and sustainment-level maintenance, and government-furnished materiel to original equipment manufacturers. The secondary supply chain would also feed foreign military sales and other governmental and non-governmental agency supply support.

Residual Sales

Whatever is left would be demilitarized and sold for its scrap value. This would include selling the residue from each of the earlier processes or properly disposing of the residue that has no further value.

A Strategic Approach

Taking a strategic approach to the end of equipment life cycle functions will benefit the Army, other Services, and DoD in many ways. The other Services can unload the materiel for which they no longer have a requirement—which, in and of itself, is worthy of a strategy.

Additional benefits range from the savings from the reutilization of repair parts, increased readiness of the systems in storage and in the field, increased support at lower costs for foreign military sales clients, the return of funds from residual assets to working capital funds, and a reduction in the environmental footprint.

The Value in Salvage.

The M113 family of vehicles has a commercially valuable engine that is used in a variety of trucks and construction equipment. Similarly, the power train components for most Army trucks, Bradley fighting vehicles, and self-propelled artillery systems have a commercial application. Other parts, including armaments, gun tubes, armor panels, suspension systems, reclaimed track, road wheels and trunion bearings can be reconditioned and sold to a variety of customers at reduced rates. While the AGT 1500 engine that powers the M-1A1/2 tank has a limited application beyond military armor, there is growing interest in using the engines in a stand-alone configuration for emergency power generation in humanitarian assistance or disaster relief operations. Undoubtedly, there are other potential applications for these systems if the price is right.

Approximately 4,000 M113A2 armored personnel carriers currently sit at Sierra Army Depot. Each one has a Detroit diesel engine with widespread military and commercial application. Likewise, each carrier bears approximately 16,000 pounds (8 tons) of high grade aluminum alloy 7017 with a current market value of approximately 85 cents per pound. It is doubtful the Army will need to keep M113s in a golden fleet or in an as-is condition, but many countries still use M113s as their primary infantry carrier and need the spare parts to keep them running at an affordable cost. The cost for TACOM to reduce an M113A2 to piece parts would be covered in the value of its residual materials. A similar case could be made for the tanks, fighting vehicles, and artillery systems.

The current size of excess Army ground equipment is arguably a transitory rather than a permanent phenomenon. It has been driven by the coincidence of a variety of currents of the past few years: force redesign, response to war, etc. This particular sequence of events, falling so closely on one another, may not happen again soon. Nonetheless, the Army could certainly benefit from a dedicated end-of-life-cycle manager.

As excess inventories are drawn down from the current high levels, this end-of-life-cycle effort could be scaled back; but the enduring legacy would be processes that continue to add benefit in value recovery, expanded support of foreign military sales customers, and the incorporation of reclamation considerations in the design and fabrication of new materiel. It also sets the stage for future equipment displacements resulting from modernization.

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