



Ammunition Readiness: Current Problems and Future Implications for Army Transformation

by Steven Mullen

As with any organization financed by the dollars of the U.S. taxpayer, the Army is forced to make tough decisions on how to spend its available funds. As a result, some programs have enjoyed full funding while others are forced to make do with fewer resources. One area that has long suffered underfunding is ammunition readiness. Ammunition has traditionally served as a bill payer for other Army programs. Recent studies—conducted by the Army, the U.S. government and outside consultants—have concluded that, as a result of this underfunding:

- The Army is woefully short of the state-of-the-art ammunition needed to perform and sustain its warfighting duties at peak efficiency.
- Training ammunition, while meeting requirements in the budget execution year, is underfunded in the out years of the Future Years Defense Plan (FYDP).
- Current funding is inadequate to maintain effective readiness or modernize the stockpile.
- The ammunition production base is suffering. Funding is marginal, and the Army cannot make up preferred munitions shortfalls during a major conflict. Replenishment is longer than three years for many critical/preferred munitions. The United States has essentially no surge capability.
- Precision munitions are not being procured in sufficient quantities to meet the Army Vision. Current engineering and manufacturing development (EMD) funding does not support increased precision for the Interim Force and only marginally supports the Objective Force.
- The Army needs to centralize, streamline and modernize its ammunition program in order to best perform its duties as the Single Manager for Conventional Ammunition (SMCA) as well as to maintain sufficient working stocks of Army-only munitions.

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These problems must be addressed now, as the U.S. forces participating in Operation Enduring Freedom wage war on the Taliban and Al Qaeda in Afghanistan. While currently limited in scope, these operations could quickly expand if and when the political leadership decides to take the war on terrorism beyond Afghanistan's borders. Even if they do not, these problems must be corrected now to ensure that the Army of tomorrow will have the ammunition it needs to fulfill its missions.

While these problems can be attributed to a variety of causes—the post-Cold War force reduction, slow-to-respond budgeting and acquisition programs—a common thread is money. As noted above, ammunition has traditionally served as a bill payer for other Army programs. As a result, there is a funding shortfall of an estimated \$6–9 billion over the next six years.¹ Were the Army able simply to shift funds from one account to another, this shortfall could easily be made up. There are, however, no funds available to shift. The Army is currently undergoing its most dynamic transformation in the past fifty years, from the Legacy Force to the Objective Force. This transformation entails the development of entirely new weapon platforms, communication networks, force structures and training programs, all of which require large amounts of resources. This investment in the future fighting force, combined with continued investment in the fighting force of today, puts a severe strain on the Army budget. What is needed, then, to redress these ammunition readiness issues is additional top-line budget authority for the Army.

Ammunition Review

What Is Ammunition? Ammunition, as discussed in this paper, includes conventional munitions, precision guided munitions (PGM) and tactical and air defense missiles. Conventional munitions include artillery, tank, mortar and small arms ammunition, and mines and grenades. PGM include Copperhead. Tactical missiles include TOW (Tube-launched, Optically-tracked, Wire-guided), Hellfire and Javelin. Air defense missiles include the Stinger and the Patriot Advanced Capability-3 (PAC-3).

The Ammunition Lifecycle. As with other materiel, ammunition is not simply created and consumed. There is a process, called the ammunition life cycle, which ensures that Army soldiers are supplied with the ammunition they require for their training and warfighting needs.

The first stage in the ammunition life cycle is determining *requirements* of the ammunition. In this stage, someone within the user community decides a new round or family of ammunition with new or enhanced capabilities (lethality, reliability, weight, bulk, etc.) is needed. In the second stage, *research and development (R&D)*, these requirements are translated into functioning munitions. The R&D stage is itself divided into three phases: the conceptual stage, the demonstration and validation stage and the full-scale development stage. Once the ammunition is developed, a *requirements computation* is made to determine how much of the new item is required and who will receive it. The ammunition then enters the *procurement and production* phase, in which the necessary materials and components are procured and turned into rounds of ammunition. Following implementation of necessary training and maintenance and storage procedures, ammunition is distributed in the *initial issue*.

Most munitions are produced long before they are used. Therefore, proper *stockpile management* is critical to ensuring that ammunition stores are maintained at peak readiness levels. *Storage*, the first stage of stockpile management, occurs both at the depot and with the end user. In the next stage, *stockpile reliability or surveillance*, quality assurance specialists evaluate the operational readiness, serviceability, safety, reliability and performance of ammunition in the stockpile. To ensure that ammunition meets these criteria, the Army conducts *maintenance* activities, ranging from derusting and repainting (normally done by the end user) to more hazardous operations such as disassembly and reassembly with serviceable components, modification and conversion (usually done on a wholesale level). If, at any stage of the life cycle, ammunition is determined to be obsolete, excess, unserviceable, uneconomical to repair or hazardous, it must undergo *demilitarization*. Methods range from detonation or burning to recycling or selling to foreign governments.

Army Roles and Responsibilities Across the Services

Munitions management is a complex enterprise and has been a major factor in modern warfare from World War I through Operation Desert Storm and the Balkans. The Secretary of the Army is designated as the Single Manager for Conventional Ammunition for the Department of Defense. The Army is therefore responsible for procurement of common conventional ammunition for all services and for assuring the availability of an ammunition industrial base capable of delivering peacetime requirements for training and modernization as well as conflict and postconflict replenishment in a timely manner. The Army is also responsible for storage and maintenance, in the Army's depots, of training and war reserve ammunition stocks for all the military services. This includes periodic inspections and surveillance of the inventories to assure stocks are ready for use, as well as movement of stocks from production facilities and depots to training sites and to ports for overseas shipment. In addition, the Army is also responsible for demilitarization of ammunition for all services that is obsolete, unsafe or no longer required.

Beyond its SMCA responsibilities, the Army must manage its Army-only ammunition program. This includes all the guided projectiles, rockets and missiles used by the Army. In meeting these responsibilities, the Army plans and executes an annual ammunition program exceeding \$2.5 billion, including research and development, procurement, and operations and maintenance (O&M).

The Issues

Warfighting Ammunition. The Army is woefully short of state-of-the-art ammunition available for combat. Sixty percent of the ammunition the Army has on hand to prosecute a major conflict is "substitute" rather than "preferred" ammunition. This means that much of a major conflict must be fought with munitions that do not meet the range, performance and/or lethality requirements for peak performance. This does not just mean using "dumb" bullets instead of precision guided munitions (a practice that entails using 10 or 20 dumb bullets in place of unavailable precision munitions). It also means using tank ammunition designed and produced 15 years ago rather than five years ago; artillery ammunition that has half the range of enemy rounds; and Bradley ammunition that was designed before reactive armor was invented.

Training Ammunition. Today, a decade after the fall of the Berlin Wall, the stockpiles of excess Cold War ammunition relied upon for training requirements have been nearly exhausted. Procurement of training ammunition has therefore consumed an increasingly large proportion of the Army's annual ammunition budget.² Nevertheless, the Army still comes up short. On an annual basis, the Army now procures approximately 60,000 tons of training ammunition (\$700–800 million), but uses 80,000 tons to meet qualification and training needs. This means 20,000 tons must come from the stockpile. However, by Fiscal Year (FY) 2007, less than 10,000 tons a year will be available from the stockpile for that purpose. As a result, training ammunition funding will fall short by some \$820 million over the next five years, according to a recent Army assessment.

Ammunition Readiness. Successful prosecution of a come-as-you-are war requires the conduct of unglamorous, often neglected peacetime activities to ensure that a reliable stockpile of serviceable ammunition can be delivered to warfighters in a timely manner. This requires fully funding and carrying out the necessary activities at all stages of the ammunition life cycle.

However, recent Army studies indicate that stockpile readiness activities are funded at only 66 percent of the requirement over the next five years. Within certain funding categories, such as surveillance, the average is only 25 percent over the same period. Studies also indicate that the Army cannot meet commander-in-chief (CINC) requirements for ammunition specified in operation plans because of transportation limitations, in both equipment and personnel. Competition for O&M funding, in both budgeting and execution, adds risk to meeting stockpile readiness requirements.

Ammunition Production Base. The status of the nation's ammunition production capability has been the subject of much scrutiny in the past few years. A recent Army study concluded that the U.S. ammunition production base has essentially no surge capability and cannot make up preferred ammunition shortfalls. The study also concluded that, after a conflict, replenishment for several critical munitions, including 120mm tank and most artillery and mortar ammunition, would take longer than three years.

More recently, a report by the National Academy of Sciences found that government-owned munitions facilities, for which the Army is responsible, lacked modern equipment, had inadequate quality control processes, and had not implemented many modern business practices. In addition, the ammunition component supplier base continues to weaken. For example, the only U.S. source for a critical raw material for combustible cartridge cases and the new modular artillery charge recently went out of business. These raw materials can now be obtained only from foreign sources in Europe and Israel.

The absence of ammunition industrial base planning and surge capability ensures that the next war will be fought only with ammunition that is in current stockpiles with an extended period of postwar vulnerability.

Future Munitions. Precision guided munitions are essential for conducting modern warfare. PGMs are necessary to decisively win a major conflict, to meet the goals established for the Interim Force and to meet public expectations regarding minimum casualties. No Army PGM production buys are programmed for the next five years, and the research and development programs that are fundamental to the future production of PGMs have been curtailed, stretched or cancelled. The Sense and Destroy Army Munition (SADARM), Tank Extended Range Munition (TERM), Precision Guided Mortar Munition (PGMM), Excalibur and Low Cost Component Munitions (LCCM) are all zeroed or delayed. Unless projections change, PGMs in meaningful quantities will not be available before 2010.

But PGM funding shortfalls are not the only munitions research and development problems. Other technologies essential for the Future Combat System and other future needs, such as propellants and explosives, receive little, if any, funding. Despite an Army study conclusion that Ammunition Manufacturing Technology (MANTECH) is required for economic production of munitions, the Army has been relying on Congress to fund ammunition MANTECH, with the result that there is no strategy, just congressional direction.

Ammunition Management Structure. The management of the total life cycle of ammunition (or even all families of ammunition) is not conducted by a single individual or program. Even after the December 2001 realignment of the Army management structure, responsibility for ammunition remains fragmented. A Program Executive Office (PEO) for Munitions was created to oversee management of conventional munitions, replacing the ad hoc Triad executive council—formed by representatives from Operations Support Command (OSC), Tank-automotive and Armaments Command (TACOM) and PEO for Ground Combat Support Systems (PEO GCSS)—formerly responsible for these duties. However, responsibility for Army missiles continues to be divided between the PEO Air and Missile Defense and PEO Tactical Missiles. Furthermore, ammunition for the Future Combat System (FCS) will be managed by the PEO GCSS and for the Objective Individual Combat Weapon (OICW) and the Objective Crew-Served Weapon (OSCW) by PEO Soldier. All PEOs report to both the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASAALT), who focuses on the acquisition phase, and the G-4 (formerly the Deputy Chief of Staff for Logistics) of Army Headquarters, who is responsible for deployment, distribution, sustainment and other nonacquisition activities. As a result, the Army ammunition community is likely to remain fragmented.

Problems with management occur not just in the intermediate stages of the ammunition cycle, but at the beginning as well. The requirements determination process is what forms the basis of the Army's

munitions program. For training ammunition, this process is relatively well defined and training readiness objectives can readily be balanced against resource constraints. For war reserve ammunition, disconnects exist between CINC-determined requirements and the requirements determined by the Headquarters, Department of the Army (HQDA) based on resource limitations. Resolution of these mismatches is essential to development of an integrated munitions resource strategy.

Ammunition and Army Transformation

Ammunition management and development will have a serious impact on the transformation of the Army from the current Legacy Force to the Objective Force of tomorrow. Just as Army Transformation requires the development, equipping and maintenance of a host of new technologies and platforms, so too will it require new ammunition and new ammunition management methods to supply this new equipment. Although the Objective Force is the force of tomorrow, much needs to be done today to ensure that the necessary ammunition will be available.

The process must begin immediately. The Army is currently developing the Interim Combat Brigade Team (IBCT), able to quickly deploy anywhere in the world. Because of requirements for the vehicle around which the IBCT is built, the Army adopted the 105mm gun for the IBCT's Mobile Gun System (MGS). The Army has not, however, used 105mm tank ammunition since the early 1990s, relying instead on the 120mm gun. Simply procuring and ensuring a steady supply of the necessary ammunition for the MGS will require significant resources if the MGS is to have something to shoot by the time it comes on line in 2004.

More immediately, the IBCT faces other issues. One of the end goals of the IBCT is the capability to complete deployment within 96 hours of the first aircraft lift-off. However, simply providing the ammunition for the IBCT will, by today's standards, be difficult. Much work needs to be done between now and Spring 2003, when the first IBCT becomes operational, to ensure that the IBCT can indeed fulfill the mission for which it was designed. The Army is already addressing this issue by developing new methods of loading and unloading pallets of ammunition. Nevertheless, repackaging alone will not solve the weight and volume problems that currently face the IBCT and will, in the upcoming decade, face the Future Combat System. Efforts need to be undertaken to reduce the weight and volume of the ammunition itself.

Perhaps the easiest way of reducing the weight and volume of the required ammunition is by simply reducing the number of rounds needed to kill a given target. This will require an increasing reliance on precision munitions. Precision munitions are already used in limited numbers within the Army—out of the several hundred types of ammunition the Army uses, slightly more than two dozen are precision munitions. This number will only increase, not just for the FCS (which will be, out of necessity, heavily reliant on precision weapons), but also to supply the Abrams tank, which will continue to be used in the coming decades, and the Crusader self-propelled howitzer, that will be available in 2008.

What It Takes to Fix the Problem Over the Next Five Years

Clearly, the Army is not going to be able to totally resolve these issues immediately. The warfighter should at least insist on the following:

- **Full funding of minimum production levels of preferred ammunition that is ready for production.** Our soldiers should not be expected to fight with older, less effective substitute munitions when more lethal, more capable munitions are available from the U.S. production base.
- **Full funding of training ammunition.** Soldiers must be as well trained as possible.
- **Full funding of ammunition O&M.** What ammunition exists must be useful and ready for issue.

- **Robust funding of the Ammunition Manufacturing Technology Program.** The Army’s investment in procuring ammunition must be leveraged by modern manufacturing processes and equipment. Ammunition MANTECH projects enjoy return-on-investment periods ranging from a few months up to three years, which translates into cheaper, higher-quality ammunition.
- **Restoration of the ammunition industrial base planning for all go-to-war munitions.** A small investment today in providing the capability for rapid increases in production of select ammunition items will pay huge dividends in mitigating U.S. vulnerabilities when we next are at war and during the postwar recovery period.
- **Development and procurement of some guided carrier rounds with multifunction capabilities and/or smart munitions.** A thorough systems look at advanced munitions, with a focus on the most “bang for the buck” rather than on perfection, is required; some must be developed and procured on a fast track.

The minimum cost delta for the fixes outlined above over the next six years is approximately \$6 billion. This investment will buy the warfighter adequate quantities of state-of-the-art war reserve ammunition; adequate quantities of training ammunition; assurance that the ammunition will be in the right place at the right time and in working order; and a common-sense approach to fielding advanced ammunition.

*It’s time to adequately fund
the most essential ingredient for success in combat—
adequate quantities of modern lethal ammunition
employed by a well-trained soldier.*

Endnotes

1. Without the routine use of substitute ammunition, this shortfall would be even greater—roughly \$16 billion for conventional munitions and \$12 billion for missiles.
2. This does not include missiles; with a few exceptions, there are no training requirements for missiles, and thus no funding for such training. Training opportunities occur only under certain circumstances, e.g., with missiles scheduled to be demilitarized.

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