A Case for Change in the Management of Class V

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The Army's ammunition[1] organizations have performed effectively during more than 10 years of war. In the austere operational environment of Afghanistan—a landlocked, mountainous, tribal land surrounded by enemies—those ammunition organizations ensured that Soldiers had the ammunition they needed while also providing ammunition to the war in Iraq. The Army's ammunition organizations developed and fielded new munitions, such as Excalibur, the advanced precision mortar initiative, and the enhanced performance round,[2] and developed procedures to supply our allies with Soviet-style munitions.[3]

Since effectiveness was our metric, the Army's ammunition organizations were not managed for maximum efficiency during this time. This paper describes the history of program management, the current situation with ammunition support organizations, and a possible way ahead for the leaner fiscal environment we face.

The Beginnings of Program Management

Secretary of Defense Robert McNamara brought the corporate concept of program management to the Department of Defense (DOD) in late 1961. At first, Army program managers were assigned to the Army Materiel Command (AMC).[4] In 1986, National Security Decision Directive (NSDD) 219 mandated the establishment of service acquisition executives charged with designating program executive offices (PEOs) that would be responsible for the oversight of acquisition programs. In essence, this change minimized the level of supervision between the program managers and their respective acquisition executives.

Later that year, the Goldwater-Nichols Act[5] codified NSDD 219 in statute, resulting in the realignment of acquisition programs under the newly formed PEOs, with Army PEOs reporting to the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASA[ALT]) in the role of Army Acquisition Executive.

More recently, Congress created the role of product support manager "to maximize value to the DOD by providing the best possible product support outcomes at the lowest operations and support cost."[6] This position, which applies to each ACAT I/II weapon system,[7] introduces additional opportunities for duplication of effort, cumbersome matrix support, and inefficiencies if it is not closely monitored.

[1] The term "ammunition" is used throughout this paper synonymously with class V, which includes items such as flares that are not considered ammunition by the general public. "Munitions" may be a better comprehensive term when a distinction is required between ammunition and other class V items.

[2] Excalibur is the XM982 extended range, precision-guided 155-millimeter artillery round. The advanced precision mortar initiative (APMI) is a 120-millimeter mortar that uses a global positioning system to increase precision. The M558A1 enhanced performance round (EPR) is a 5.56-millimeter bullet that provides better results against both hard and soft targets than its predecessor and that contains no lead, a long-term benefit to the environment, particularly at Army training ranges.

[3] Because the Kalashnikov AK–47, a rifle common in Afghanistan, does not use U.S. or North Atlantic Treaty Organization (NATO) standard bullets, the United States had to develop a way to rearm its allies with Soviet-style ammunition. Similarly, the United States provided security assistance with equipment that was not U.S. or NATO standard.

[4] After the Army Materiel Command's establishment in 1962, its commanding general, General Frank S. Besson, Jr., requested approval for 30 projects and charters in August 1962.

[5] Goldwater-Nichols DOD Reorganization Act of 1986, Public Law 99–433.

[6] Section 805, Fiscal Year (FY) 2010 National Defense Authorization Act, Public Law 111–84.

[7] Acquisition Category (ACAT) I systems are those that have a research, development, test, and evaluation (RDT&E) cost of more than $365 million or a procurement cost of more than $2.19 billion (using FY 2000 dollars). ACAT II systems are smaller major systems with the threshold amount of $140 million for RDT&E or $660 million in procurement costs. Below that are ACAT III less-than-major systems. See 10 U.S. Code 2430, Major defense acquisition program defined.

Life Cycle Management of Class VII Today

The Army manages class VII (major end items) programs through life cycle management commands (LCMCs). The first three LCMCs were the Aviation and Missile LCMC at Redstone Arsenal, Alabama, the Communications-Electronics Command (CECOM) LCMC at Aberdeen Proving Ground, Maryland, and the TACOM LCMC[8] at Warren, Michigan. These three commands manage the Army's class VII from a wholesale perspective.

Each LCMC has three operational components: technology, acquisition, and logistics. The technology function comes from one or more research, development, and engineering centers commanded by the Army Research, Development and Engineering Command (RDECOM) and aligned with the LCMC. The acquisition function comes from one or more PEOs that by law report to the ASA(ALT). All logistics functions remain with the AMC major subordinate command.

A rationale for the LCMCs is that sustainment costs constitute an estimated 50 percent[9] to 70 percent[10] of the life-cycle cost of an end item. Class IX (repair parts) and related maintenance are cost drivers of this sustainment tail, which is common to the Aviation and Missile, CECOM, and TACOM LCMC products. Having a program manager involved in the program's life cycle of system upgrades, service-life extension programs, and other modifications requiring acquisition management expertise makes sense for class VII and is codified in Defense guidance.[11]

This Defense guidance does not dictate the Army's current management structure. The Navy and Air Force take different approaches than the Army to accomplish life-cycle management. Simply put, the law does not tell us how to manage the life cycle.

Current Sustainment of Ammunition

The management structure for ammunition parallels that of the other Army LCMCs. The Joint Munitions and Lethality (JM&L) LCMC is more of a coordinating body than an actual command. It integrates the research and development efforts of the Armaments Research, Development and Engineering Center (ARDEC), which reports to RDECOM; the acquisition efforts of PEO Ammunition, which reports to the ASA(ALT); and the logistics efforts of the Joint Munitions Command (JMC), a major subordinate command of AMC. The JMC commander is also the JM&L LCMC commander in this construct.[12]

JMC is responsible for the sustainment of conventional ammunition[13] for DOD in the Army's role as the single manager for conventional ammunition. JMC does this at eight storage locations in the continental United States (CONUS).[14]

Unique Characteristics of Ammunition

Although the management structure for class V (ammunition) parallels the management structure for class VII, the differences inherent in class V make that structure less than optimal. It is important to review the differences in determining the best management structure for ammunition.

Class V has unique characteristics—one of the rationales for having ammunition as its own class of supply. Class V items have hazardous materials constraints similar to those of class VIII (medical materiel) items, while classes VII and IX generally do not. Class V items have shelf-life limitations, similar to those of class I (subsistence) items, which are not major concerns for the other LCMCs that focus on classes VII and IX.

Another major difference between class V and the classes VII or IX items managed by the other LCMCs is that class V sustainment costs are not as dependent on operating tempo (OPTEMPO). When OPTEMPO is high, helicopters and tanks require more frequent maintenance and use more spare parts, so sustainment costs *per item* rise with increased usage rates.

Unlike the situation with class VII end items, spare parts and maintenance are not major cost drivers for class V. Bullets do not require spare parts, and while bombs require some maintenance (such as repainting them after years in storage), bomb maintenance is minor compared to the maintenance of tanks and helicopters.

The sustainment of ammunition consists of storage, care of stocks in storage (COSIS), surveillance, distribution, and demilitarization. Surveillance consists of examining ammunition items for degradation (such as rust or corrosion), sampling the propellants that degrade over time, and performing other tests on the ammunition to ensure safety and usability. Demilitarization means deliberately rendering an item unusable for its intended military purpose. The Army demilitarizes ammunition that is unsafe, obsolete, or in excess to the needs of DOD.

While helicopters measure their usage in flying hours, a bullet, bomb, or grenade is used once. Thus, class V sustainment costs per item do not increase with increased OPTEM-

[8] Before it was designated an LCMC, TACOM stood for Tank-Automotive and Armaments Command.

[9] "Impact of ammunition performance on weapon reliability and life cycle cost," Reliability and Maintainability Symposium (RAMS), 2011 Proceedings, Lake Buena Vista, Florida, 24 to 27 January 2011.

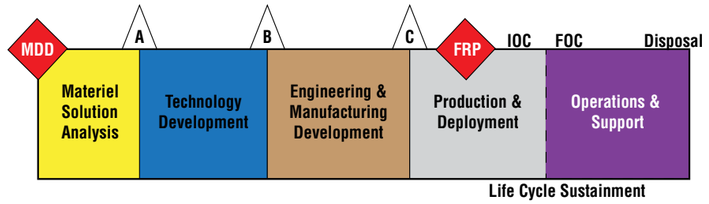
[10] Daniel W. Miles, Program Life Cycle Cost Driver Model, June 2008, http://government.gpstrategies.com/common/pdf/govt/cdProgramLifeCycle.pdf.

[11] DOD Directive 5000.01, The Defense Acquisition System, dated 12 May 2003, designates program managers as the individuals "with responsibility for and authority to accomplish program objectives for development, production and sustainment to meet the user's operational needs."

[12] Defense Acquisition Guidebook, DOD Instruction 5000.02, Enclosure 10, states, "The PEO shall be dedicated to executive management and shall not have other command responsibilities unless waived by the USD(AT&L) [Under Secretary of Defense for Acquisition, Technology, and Logistics]."

[13] Here, conventional means that it is not nuclear or chemical.

[14] The eight are Anniston Munitions Center, Blue Grass Army Depot, Crane Army Ammunition Activity, Hawthorne Army Depot, Letterkenny Munitions Center, McAlester Army Ammunition Plant, Pine Bluff Arsenal, and Tooele Army Depot.



PO. Overall class V costs increase because more items are produced and shipped; however, sustainment cost per item may actually decrease during a conflict since ammunition is stored for shorter periods, requiring less COSIS and surveillance.

The Development of Army Materiel

Before we move to recommendations on how to change ammunition management, we should review how Army materiel is developed. The chart above shows the flow of a new product through the acquisition milestones.

The entry point into the acquisition process is the materiel development decision. The three milestones are milestone A, which approves entry into technology development; milestone B, which approves entry into engineering and manufacturing development; and milestone C which approves entry into the production and development phase. After milestone C, the item begins low-rate initial production, followed by full-rate production that provides first an initial operational capability and then full operational capability.[15]

One way that ammunition differs from the other LCMC products today is that the disposal management function for ammunition resides at PEO Ammunition. For the products of the other LCMCs, Defense Logistics Agency (DLA) Disposal Services carries out demilitarization and disposal.

Issues in Ammunition Management

Four areas in the management of class V currently experience redundancies and inefficiencies and require changes to become more efficient, effective, and agile.

Industrial base. Currently, JMC and the Program Manager for Joint Services in PEO Ammunition have redundancies in industrial base management, and the funding stream exacerbates this problem. PEO Ammunition receives production base support (PBS) dollars as part of its procurement funding. PBS funds pay for facilities and equipment at JMC's Government-owned, contractor-operated (GOCO) facilities. Meanwhile, JMC's Government-owned, Government-operated (GOGO) facilities receive funds for facilities and equipment through the Capital Investment Program or MCA [military construction, Army] accounts. In essence, JMC manages the GOCO and GOGO ammunition installations, but PEO Ammunition funds GOCO modernization efforts.

Responsibility for demilitarization. JMC is responsible for project planning, tracking and reporting, resource management, demilitarization technology and logistics support, safety, security, transportation, and environmental expertise as well as legal and contracting support of demilitarization. The Program Manager for Demilitarization under PEO Ammunition applies the typical program management responsibilities to the conventional ammunition demilitarization program, which is conducted with procurement funds.

Although the roles and responsibilities for the industrial base and demilitarization are clearly distinct, they have not been executed with the same amount of clarity. Duties overlap, and it is often hard to determine who is responsible.

Facility improvements at GOCO plants and demilitarization are not the only things funded with ammunition procurement dollars. The salaries, benefits, and ancillary costs of PEO Ammunition personnel, service contractors, and matrix support personnel at ARDEC are also funded with these dollars. The funding stream obscures the true per-item cost from Congress and causes duplication of effort.

Alignment. The three organizations in the JM&L LCMC do not have a shared list of items for which they are responsible. ARDEC serves as the research, development, and engineering center for ammunition and armaments. Over time, the Army learned the wisdom of having projectiles and howitzers, guns, rifles, and mortar tubes work well together, so having ARDEC responsible for all of them makes sense for that research and development mission. However, it means that ARDEC works on projects that align to two AMC major subordinate commands (TACOM and JMC) while reporting to a third (RDECOM).

PEO Ammunition is responsible for the acquisition of common (used by more than one service) conventional ammunition.[16] However, despite its name, PEO Ammunition is responsible for the acquisition of much more than common ammunition, as it also has program managers for towed artillery and a variety of anti-improvised explosive device vehicles and systems. As such, PEO Ammunition programs align with TACOM LCMC in addition to JM&L LCMC.

As the sustainment arm of JM&L LCMC, JMC also provides logistics support to other Army organizations involved in class V, including the Aviation and Missile LCMC and the Army Space and Missile Defense Command, and to the other military services for missiles and non-SMCA [single manager for conventional ammunition] ammunition items, such as Navy depth charges. This mission aligns JMC with multiple LCMCs and PEOs. JMC and PEO Ammunition's differing responsibilities for non-Army class V add to the complexity.[17]

Management of stocks in theater. The management of ammunition in the theater of war has not attained the levels of efficiency and effectiveness typically found in CONUS. There are two contributing factors. First, because the Army relies on contractors to operate its ammunition supply points (ASPs) in CONUS, few Soldiers have hands-on experience in operating an ASP.[18] Second, the CONUS ammunition storage sites are fixed installations with experienced staffs, while the theater ammunition storage facilities are less permanent with staffs that rotate in and out of theater without developing long-term working relationships.

Courses of Action to Reduce Ammunition Issues

One possible course of action is to return to the management structure of the past. At various times in the history of AMC, the research, development, and engineering centers reported to the AMC major subordinate commands, as did the contracting centers. This structure provided unity of command not found in today's organizational structure. For example, as recently as 1994, ARDEC, the contracting office at Rock Island, Illinois, and associated program managers were all part of the Army's Armament, Munitions and Chemical Command, a predecessor of JMC.

Nostalgia may cause us to forget why the Army Contracting Command and RDECOM were formed. In the case of the contracting centers separating into their own command, the Gansler Commission[19] believed that aligning and consolidating contracting and command authority was important to achieving the best possible Army contracting capability. Poor contract oversight in theater was the impetus behind the Gansler Commission. The alignment of all research, development, and engineering centers under RDECOM derived from a similar study in response to issues at that time.[20] However, a return to the structure of the past is not feasible, and we do not want to go back to the future.

With that said, there are actions that we can take to reduce friction in the ammunition community, such as better structuring the components of the JM&L LCMC and improving logistics support to Soldiers and other ammunition users.

This second possible course of action has three key steps and focuses on the roles of JMC and associated PEOs.

Step 1: Assign responsibility for GOCO production plants to PEO Ammunition. In the area of industrial base management, an ongoing pilot program of AMC special installations creates an opportunity for change. If the pilot succeeds, the garrisons for the GOCO ammunition plants, which are currently under JMC command, will align under the Army Installation Management Command (IMCOM).

Since PEO Ammunition provides the workload for the ammunition plants (either directly or through competitive procedures) and funds their equipment and facility requirements, it makes sense for the PEO to assume total responsibility for their production. Having PEO Ammunition assume total responsibility for production at the GOCO ammunition-producing plants eliminates one area of duplication between JMC and PEO Ammunition and streamlines responsibility for managing that portion of the organic industrial base. This change can occur whether or not the AMC/IMCOM special installation pilot succeeds.

Step 2: Assign responsibility for class V to JMC at milestone C. Army Regulation 70–1, Army Acquisition Policy, recognizes the PEO as both the materiel developer and life-cycle manager and AMC as the responsible sustainment organization. This leads to a possible solution for the issues involved with transition and demilitarization.

Although there is currently no formal transition process from ASA(ALT) to AMC, there comes a point when the sustainment organization needs to do the work. For ammunition, that point is when the item is fielded; after that, the item needs the logistics sustainment functions of storage, surveillance, distribution, and demilitarization. A PEO Soldier pilot program, which will be discussed later, shows how this can work.

Demilitarization is a key tool in stockpile management for any commodity, but particularly for ammunition. Year after year, the ammunition procurement dollars devoted to demilitarization are insufficient. In fact, more than one-third of the ammunition stockpile is now awaiting disposal. This requires JMC to maintain more storage capacity than is needed for contingency requirements. With an aggressive schedule of demilitarization, the Army's ammunition footprint can shrink substantially. As the ammunition sustainment program becomes more efficient, taxpayers save money in the long run.

The recommendation in this area is to have JMC assume all responsibility for managing and conducting demilitarization operations as part of its joint ammunition stockpile management mission. PEO Ammunition's role in demilitarization will be to create ammunition that can be destroyed. Since JMC's stockpile management extends to missiles, the demilitarization of the Aviation and Missile Command's, the Army Space and Missile Defense Command's, and other services' missiles should be included as well since those items contribute to the storage problems at JMC's depots.

Step 3: Assign responsibility for class V stocks in theater to JMC. As for ammunition in theater, since JMC manages wholesale ammunition at CONUS storage depots and retail

[15] DOD Instruction 5000.02, Operation of the Defense Acquisition System, dated 8 December 2008, provides additional detail in this area.

[16] As the DOD executive agent, the Army is responsible for managing common conventional ammunition. The Army's role as single manager for conventional ammunition (SMCA) began in 1977.

[17] See *Conquering Complexity in Your Business* by Michael L. George and Stephen A. Wilson (McGraw-Hill, New York, 2004) or *Waging War on Complexity Costs* by Stephen A. Wilson and Andrei Perumal (McGraw-Hill, New York, 2009) for a discussion on how complexity increases cost.

[18] Captain Theodore L. Zagraniski and Chief Warrant Officer 2 Gary N. Carr, "Training Ammunition Supply Soldiers While Deployed," *Army Sustainment*, Vol. 43, Issue 2, March–April 2011, pp. 42–46.

[19] Report of the Commission on Army Acquisition and Program Management in Expeditionary Operations, 31 October 2007.

[20] AMC established RDECOM as a provisional organization on 9 October 2003 and as a permanent organization on 1 March 2004.