



July 2015

# DEFENSE LOGISTICS

## Improved Data and Information Sharing Could Aid in DOD's Management of Ammunition Categorized for Disposal

# GAO Highlights

Highlights of [GAO-15-538](#), a report to congressional committees

## Why GAO Did This Study

DOD manages conventional ammunition that ranges from small arms cartridges to rockets, mortars, artillery shells, and tactical missiles. When a military service determines such ammunition is beyond its needs, obsolete, or unserviceable, it is offered to the other services and if not taken, transferred to the Army, which manages the CAD stockpile and takes actions to demilitarize and dispose of the ammunition in the stockpile. According to data provided by DOD officials, as of February 2015, the stockpile was about 529,373 tons. DOD estimates that from fiscal year 2016 to fiscal year 2020 it will add an additional 582,789 tons of conventional ammunition to this CAD stockpile.

Section 352 of the National Defense Authorization Act for Fiscal Year 2015 included a provision that GAO review and report on the management of DOD's CAD stockpile.

This report assesses, among other things, the extent to which DOD has adequately maintained and shared information on excess, obsolete, and unserviceable ammunition for the military services. GAO reviewed applicable guidance and the military service ammunition databases; visited an Army depot that conducts ammunition demilitarization; and interviewed appropriate DOD officials.

## What GAO Recommends

GAO recommends DOD develop a plan to identify and record missing weight data and develop a systematic means to share information on the stockpile with other government agencies. DOD agreed with GAO's recommendations.

View [GAO-15-538](#). For more information, contact Zina Merritt at (202) 512-5257 or [merrittz@gao.gov](mailto:merrittz@gao.gov)

July 2015

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### Improved Data and Information Sharing Could Aid in DOD's Management of Ammunition Categorized for Disposal

## What GAO Found

The Department of Defense (DOD) maintains information on its excess, obsolete, and unserviceable conventional ammunition for the military services and shares this information on a limited basis with other government agencies, but its management of its conventional ammunition awaiting demilitarization and disposal (CAD) stockpile can be strengthened in two areas.

- The Army uses its Logistics Modernization Program database to maintain consolidated information on ammunition in the CAD stockpile, but GAO found that records for some items do not include complete data on weight. Specifically, of 36,355 records in the database, 2,829 did not have assigned weights as of February 2015. Internal control standards state that an entity should have controls to ensure that all transactions are complete and accurately recorded. DOD officials stated they are trying to correct current records with missing data; however, the number of records without weight data has increased. For example, as of February 2015, the number of records with missing data had increased by more than 600 since 2012. Since DOD uses weight in determining, among other things, cost estimates for demilitarization projects and what ammunition to demilitarize, missing weight data can negatively impact its efforts to destroy the most ammunition possible with the resources available.
- The military services have access to information on the CAD stockpile maintained in the Army's database and can search it for useable ammunition that could fill their requirements, but other government agencies do not and DOD does not have a systematic means for sharing such information. Federal internal control standards state that management should ensure there are adequate means of communicating with, and obtaining information from, external stakeholders. DOD officials told GAO that there have been instances of transfers of ammunition to other government agencies, but these have been done informally and on a limited basis. Without a systematic means for regularly sharing information on useable ammunition beyond DOD's needs, both DOD and other agencies may be missing opportunities to reduce costs related to demilitarization and ammunition procurement.

## Open Burn Destruction of Ammunition



Source: U.S. Army. | GAO-15-538

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### Abbreviations List

CAD	Conventional Ammunition Demilitarization
DOD	Department of Defense
DODIC	Department of Defense Identification Code
FY	Fiscal Year
LMP	Logistics Modernization Program
NSN	National Stock Number
RDT&E	Research, Development, Test, and Evaluation
SMCA	Single Manager for Conventional Ammunition
USD (AT&L)	Under Secretary of Defense for Acquisition, Technology, and Logistics
USSOCOM	United States Special Operations Command

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July 21, 2015

## Congressional Committees

The Department of Defense (DOD) manages conventional ammunition that includes items ranging from small arms cartridges to rockets, mortars, and artillery to tactical missiles.<sup>1</sup> According to data provided by DOD officials, as of February 2015,<sup>2</sup> the stockpile of conventional ammunition awaiting demilitarization<sup>3</sup> and disposal<sup>4</sup> (CAD stockpile) was approximately 529,373 tons.<sup>5</sup> DOD estimates that from fiscal year 2016 to fiscal year 2020 it will add an additional 582,789 tons of conventional ammunition to the CAD stockpile, making the proper management of the disposal of such large quantities of explosive materiel critical. DOD disposes of the materiel by burning it, detonating it with other explosives, or using a number of closed disposal technologies that control or clean

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<sup>1</sup>DOD defines conventional ammunition as an end item, complete round, or materiel component charged with explosives, propellants, pyrotechnics, or initiating composition for use in connection with defense or offense (including demolitions), as well as ammunition used for training, ceremonial, or nonoperational purposes. This includes inert devices that replicate live ammunition, commonly referred to as dummy ammunition, which contain no explosive materials. Conventional ammunition does not include nuclear and special weapons.

<sup>2</sup>The data on the conventional ammunition awaiting demilitarization were obtained from the Army's Logistics Modernization Program. February 2015 data were the most recent available at the time of this report.

<sup>3</sup>Demilitarization is defined as the act of destroying the military capability inherent in certain types of equipment or material. The term includes mutilation, dumping at sea, scrapping, melting, burning, or alteration designed to prevent the further use of this equipment and material for its originally intended military or lethal purpose and applies equally to materiel in unserviceable or serviceable condition that has been screened through an Inventory Control Point and declared excess or foreign excess. Department of Defense (DOD) Manual 4160.21-M, *Defense Materiel Disposition Manual* (Aug. 18, 1997).

<sup>4</sup>Disposal is defined as the process of reutilizing, transferring, donating, selling, destroying, or other ultimate disposition of personal property. DOD Manual 4160.21-M.

<sup>5</sup>It is our understanding that DOD refers to this stockpile alternatively as simply the demil or demilitarization stockpile, and also tracks this by referring to it as the B5A account or Resource, Recovery, and Disposition Account. In this report, we will simply use the term CAD stockpile to refer to the stockpile of conventional ammunition awaiting demilitarization and disposal. DOD uses weight expressed in tons, not dollar value, to quantify the size of the CAD stockpile.

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the discharge waste from the demilitarization process. All the military services—the Army, the Navy, the Air Force, and the Marine Corps—use conventional ammunition and the Army is DOD’s Single Manager for Conventional Ammunition (SMCA).<sup>6</sup> In this role, the Army is responsible for centrally managing the demilitarization and disposal of conventional ammunition in the CAD stockpile.<sup>7</sup>

Section 352 of the Carl Levin and Howard P. ‘Buck’ McKeon National Defense Authorization Act for Fiscal Year 2015 included a provision that GAO review and report on the management of DOD’s CAD stockpile.<sup>8</sup> For this report, we (1) assess the extent to which DOD has adequately maintained and shared information on the quantity, condition, and location of excess, obsolete, and unserviceable conventional ammunition for each military service; (2) examine challenges, if any, DOD has identified in managing the current and anticipated CAD stockpile, and if so, actions taken to address those challenges; and (3) describe DOD’s average costs of storing and maintaining items in the CAD stockpile and the average costs of the demilitarization and disposal of items in the stockpile.<sup>9</sup> We also describe DOD policies and procedures governing the

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<sup>6</sup>To the extent that the Department of Defense provides munitions to the United States Coast Guard, the United States Coast Guard agrees to also abide by the same SMCA procedures. GAO did not include the Coast Guard within the scope of this particular review.

<sup>7</sup>U.S. Special Operations Command and the military services are required to comply with DOD guidance on conventional ammunition management. However, an official with the U.S. Special Operations Command indicated that the U.S. Special Operations Command does not manage excess, obsolete, and unserviceable ammunition. If any of the special operations force units have ammunition that is unserviceable or above their needs, the special operations force units contact their military service for disposition instructions. Therefore, U.S. Special Operations Command was not included in the scope of this performance audit.

<sup>8</sup>Pub. L. No. 113-291 § 352(c) (2014).

<sup>9</sup>DOD refers to ammunition that is not required by a military service or defense agency for its needs and the discharge of its responsibilities as determined by the head of the service or agency as military service or defense agency excess. According to DOD Manual 4160.21-M such ammunition shall be screened by a DOD activity for DOD reutilization. Once this screening has taken place, any ammunition that is not required for the needs and the discharge of the responsibilities of any DOD activity is then considered DOD excess, and designated as excess property consistent with the statutory definition of excess property at 40 U.S.C. § 102. Therefore, to avoid confusion with the statutory definition, before the determination is made that the ammunition is excess, we will refer to the excess, obsolete, and unserviceable ammunition in this report as unserviceable or above a service’s needs.

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demilitarization of excess, obsolete, and unserviceable conventional ammunition and discuss the extent to which they are consistent with DOD guidance for developing policies and procedures (see app. I).

To assess the extent to which DOD has adequately maintained and shared information on the quantity, condition, and location of excess, obsolete, and unserviceable conventional ammunition for each military service, we reviewed DOD's inventory data on excess, obsolete, and unserviceable conventional ammunition held in the CAD stockpile as of February 2015 to determine how complete and accurate the data are. In addition, we interviewed officials from each military service to determine how they managed unserviceable ammunition and serviceable ammunition that is beyond the services' needs. We also determined the extent to which the information in the services' ammunition inventory systems is useful for their purposes. We interviewed SMCA and service officials to learn how information on excess, obsolete, and unserviceable ammunition is shared. After initial discussions with DOD officials, we determined that the department uses weight rather than the value of ammunition in quantifying the amount of its CAD stockpile and we conducted our assessment based on the same criteria.<sup>10</sup> Further, we conducted a data reliability assessment of the military services' data in their respective information management systems for ammunition—Air Force Combat Ammunition System, the Navy's Ordnance Information System, the Marine Corps' Ordnance Information System – Marine Corps, and the Army's Logistics Modernization Program—by reviewing the services' responses to questionnaires on the internal controls applied to their systems, using *Standards for Internal Control in Federal Government* as criteria,<sup>11</sup> and found that the data were sufficiently reliable for determining whether DOD adequately maintained information on the quantity, condition, and location of excess, obsolete, and unserviceable

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<sup>10</sup>According to DOD officials, value is the cost of the item.

<sup>11</sup>GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#), (Washington, D.C.: Nov. 1999).

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conventional ammunition in its accounts and for our reporting purposes.<sup>12</sup> Also, we interviewed service officials in the Army, Navy, Air Force, and Marine Corps to learn how ammunition is managed once the decision is made to demilitarize and transfer it to the CAD stockpile. We also interviewed officials on the visibility, accessibility, accuracy, and usefulness of the data on the CAD stockpile.

To examine challenges, if any, DOD has identified in managing the current and anticipated CAD stockpile, and if so, actions taken to address those challenges, we reviewed DOD reports on the management of the current CAD stockpile to identify any problem areas and DOD's plans to address these problems. We visited the Army's McAlester Army Ammunition Plant in Oklahoma to examine the management of its ammunition demilitarization operations, to include storage practices and a variety of methods to demilitarize the ammunition. We selected McAlester Army Ammunition Plant to visit because a large portion of the CAD stockpile is stored there and it uses several methods to demilitarize ammunition. We also contacted and obtained the same information from the other six depots on the management of their ammunition demilitarization operations.<sup>13</sup> We interviewed SMCA officials and officials in the Army, Navy, Air Force, and Marine Corps to identify challenges, if any, they face in managing the stockpile and discuss the actions they have taken to address these challenges.

To describe DOD's average costs of storing and maintaining items in the CAD stockpile and the average costs of the demilitarization and disposal of items in the stockpile, we obtained fiscal year 2015 cost estimates for

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<sup>12</sup>We sent the services a list of questions soliciting information on the controls implemented in their ammunition information systems. The questions were designed to determine if there were controls that restricted access to the information system to prevent unauthorized access or inappropriate use and if there were data quality controls that ensured completeness, accuracy, authorization, and validity of all transactions. We reviewed the services' responses and any documentation they provided. We also interviewed officials to clarify their responses and obtain any needed additional information.

<sup>13</sup>DOD has seven depots that store and demilitarize the CAD stockpile. They are Crane Army Ammunition Activity, Tooele Army Depot, Hawthorne Army Depot, McAlester Army Ammunition Plant, Anniston Munitions Center, Blue Grass Army Depot, and Letterkenny Munitions Center. Additionally, DOD has five other locations that store a small portion of the CAD stockpile, less than 2 per cent, and they are Holston Army Ammunition Plant, Iowa Army Ammunition Plant, Pine Bluff Arsenal, Radford Army Ammunition Plant, and Milan Army Ammunition Plant.



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storing and demilitarizing ammunition from the Army Materiel Command's Joint Munitions Command, and interviewed officials about what factors were used to develop these cost estimates. We also reviewed a 2013 DOD report on the cost of demilitarizing conventional ammunition to determine the factors that drive demilitarization costs. Additionally, we interviewed Army officials on the process they use to make demilitarization decisions.

To describe DOD's policies and procedures governing the demilitarization of excess, obsolete, and unserviceable conventional ammunition and discuss the extent to which they are consistent with DOD guidance for developing policies and procedures, we interviewed officials in the Army, Navy, Air Force, and Marine Corps, and at the demilitarization depots to obtain their opinions on the effectiveness and usefulness of DOD policies and procedures governing the demilitarization of conventional ammunition. We also compared the requirements in DOD Instruction 5025.01, *DOD Issuances Program*, with the policies and procedures governing the demilitarization of conventional ammunition and determined whether they followed guidance on how such documents should be developed, the type of information that should be included, and how often they should be updated.<sup>14</sup> We provide further details on our scope and methodology in appendix II.

We conducted this performance audit from August 2014 to July 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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<sup>14</sup>Department of Defense Instruction (DODI) 5025.01, *DOD Issuances Program*, (June 6, 2014, incorporating Change 1, effective Oct. 17, 2014).

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## Background

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### DOD Management of Excess, Obsolete, and Unserviceable Conventional Ammunition

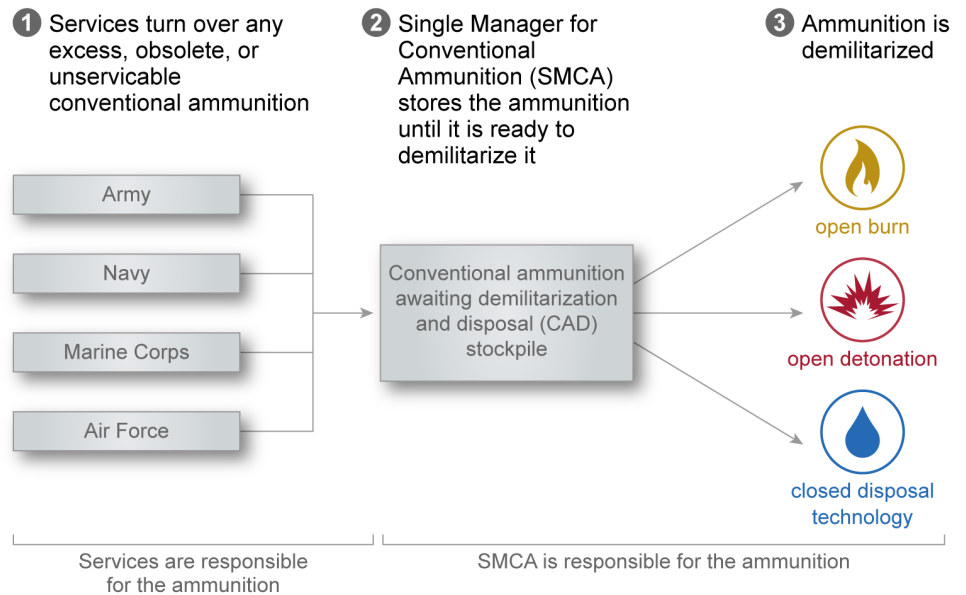
Each military service—the Army, the Navy, the Air Force, and the Marine Corps—is responsible for assessing and making decisions regarding the ammunition in its inventory. The Army, as the Single Manager for Conventional Ammunition (SMCA), is responsible for centrally managing the demilitarization of all conventional ammunition including non-SMCA-managed items, for which capability, technology, and facilities exist to complete demilitarization and disposal.<sup>15</sup> The services determine if the conventional ammunition in their accounts is unserviceable or above their needs, and if so, transfer the ammunition to installations as specified by the SMCA.<sup>16</sup> However, before proceeding with demilitarization, any serviceable conventional ammunition that is beyond a service's needs is to be offered to the other services through an annual cross-leveling process. The services are to screen all conventional ammunition inventories that are beyond their needs by the other military services. Once the screening is complete, the service can transfer ammunition to the demilitarization account as DOD excess, except when safety issues require immediate disposal. As shown in figure 1, once it has been determined that the conventional ammunition is unserviceable or DOD excess, the services deliver the ammunition to one of the seven demilitarization depots in the United States and the ammunition is incorporated into the CAD stockpile. Appendix III provides a map of the seven demilitarization depots and an explanation of the demilitarization methods used by the Army.

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<sup>15</sup>Non-SMCA items are those items assigned specifically to the Military Departments and U.S. Special Operations Command for management and include such items as naval mines, torpedoes, and guided projectiles.

<sup>16</sup>According to service officials, the one exception is material that cannot be transported safely, which is disposed of by the respective service's explosive ordnance disposal personnel at the base where it is stored.

**Figure 1: Flow of Conventional Ammunition Possession Until It Is Demilitarized**



Source: GAO analysis of Department of Defense (DOD) data. | GAO-15-538

Note: There are a number of closed disposal technologies used for demilitarization. If DOD does not have a demilitarization process for a particular type of ammunition, it is retained in the CAD stockpile until one is identified and funded. If the ammunition is serviceable, it may alternatively be disposed of by sale or transfer, subject to certain restrictions.

## Structure for DOD Ammunition Demilitarization Process

Multiple DOD entities have responsibilities related to managing and overseeing conventional ammunition, with the Army having a prominent role. The Secretary of the Army serves as DOD's SMCA and is responsible for centrally managing all aspects of the life cycle management of conventional ammunition, from research and development through demilitarization and disposal. The Program Executive Office for Ammunition has been designated the SMCA Executor and is responsible for executing all the functions of the SMCA.<sup>17</sup> The Program Executive Office for Ammunition works with Joint Munitions

<sup>17</sup>Within the Program Executive Office for Ammunition, the Product Manager for Demilitarization was established to centralize responsibility and provide acquisition management for the DOD conventional ammunition demilitarization programs. It performs demilitarization life-cycle management of conventional ammunition for DOD. The Product Manager for Demilitarization is part of the Program Executive Office for Ammunition organization at Picatinny Arsenal, New Jersey and is subordinate to the Project Director for Joint Services.

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Command and the Aviation and Missile Command to manage the demilitarization of conventional ammunition at seven Army depots and several commercial firms.<sup>18</sup> The Program Executive Office for Ammunition budgets and funds the demilitarization and disposal of all munitions in the CAD stockpile. In addition, for ammunition, such as Bullpup rockets, that has no demilitarization process, the Program Executive Office for Ammunition plans, programs, budgets, and funds a joint-service research and development program to develop the necessary capability, technology, and facilities to demilitarize the ammunition.<sup>19</sup> Within the Army Materiel Command, Army Aviation and Missile Command is responsible for the demilitarization of missiles and components, and the Joint Munitions Command is responsible for demilitarization of all remaining conventional ammunition. Army Aviation and Missile Command develops and implements the annual missile demilitarization operating plan, and Joint Munitions Command does the same for the CAD stockpile. Furthermore, Joint Munitions Command provides logistics and sustainment support to the Program Executive Office for Ammunition and the Army Aviation and Missile Command. Joint Munitions Command also oversees the storage of the CAD stockpile, maintains the CAD stockpile database, and arranges the transportation of conventional ammunition to the demilitarization site when necessary.

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## Annual Stratification and Cross-Leveling Process

The military departments have a process for collecting and sharing data on conventional ammunition through inventory stratification reports that they are required to prepare at least annually. They use these reports to identify inventory owned by one department that may be available to meet the needs of another department, as well as to identify both inventory deficiencies and excesses. DOD Manual 4140.01 Volumes 6 and 10 direct the military departments to assess the ability of the ammunition inventory to meet their needs by stratifying their inventories into various categories and requires them to prepare a report at least annually for

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<sup>18</sup>Since the commercial firms only demilitarize the conventional ammunition transferred to them and play no role in managing the CAD stockpile, we did not include them in the scope of our review.

<sup>19</sup>Developed in the 1950s, the Bullpup was the first successful guided tactical air-to-ground missile used by the U.S. Navy and the U.S. Air Force.

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internal purposes that lists the current inventory levels of all ammunition.<sup>20</sup> The annual internal report divides the inventory into the categories of requirement-related munitions stock, economic retention munitions stock, contingency retention munitions stock, and potential reutilization and disposal stock.<sup>21</sup> The manual also directs the departments to develop an external report identifying inventory in the same categories for each ammunition listed. The military departments are to use these reports, among other things, to identify opportunities for redistributing ammunition to meet unfilled needs in other military departments. The reports are then distributed to the other military departments to provide visibility. In addition, the Office of the Executive Director for Conventional Ammunition, which facilitates this process, compares the data in the inventory reports with data on planned procurements of ammunition. After the departments share their annual reports on ammunition inventory, including which ammunition could be reutilized; department officials participate in the Quad Services Review and review all the other departments' stratification reports to identify potential cross-leveling opportunities and request logistics data for items of interest.<sup>22</sup>

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<sup>20</sup>Department of Defense Manual 4140.01, Volume 6, *DOD Supply Chain Materiel Management Procedures: Materiel Returns, Retention, and Disposition* (Feb. 10, 2014) and Department of Defense Manual 4140.01, Volume 10, *DOD Supply Chain Materiel Management Procedures: Metrics and Inventory Stratification Reporting* (Feb. 10, 2014).

<sup>21</sup>Requirement-related munitions stock is the inventory of munitions stock, including preferred and substitutes. Economic retention munitions stock is the inventory quantity greater than the requirement-related munitions stock that is found through economic analysis to be more cost effective to retain for future peacetime issues, versus disposing of it and reacquiring it in the future to meet projected requirements. Contingency retention munitions stock is the inventory quantity of an item greater than the requirement-related munitions stock that will be retained to support requirements not included in the total munitions requirement calculation. These assets are retained for contingencies and intended for situations other than those already considered in the war reserve materiel or the total munitions requirement requirements. Potential reutilization and disposal stock is the inventory quantity of an item that is greater than the sum of the requirement-related munitions stock, the economic retention munitions stock, and the contingency retention munitions stock. The potential reutilization and disposal stock is considered excess to the needs of an individual military department, but has not yet been found to be excess to the needs of all the military departments.

<sup>22</sup>Cross-leveling is the transfer of ownership of retention and potential reutilization assets between the military departments (including the U.S. Coast Guard) for application against a total munitions requirement shortfall. DOD Manual 4140.01, Volume 6.

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DOD guidance indicates that this cross-leveling process should be used to offset individual procurements of the military departments in coordination with the Under Secretary of Defense for Acquisition, Technology, and Logistics.<sup>23</sup> For example, the Executive Director for Conventional Ammunition reported in September 2014 that DOD avoids an average of \$72 million annually in procurement costs by using the redistribution process regarding each service's inventory holdings that exceed their needs.<sup>24</sup> During the fiscal year 2014 redistribution process, the services transferred approximately 5 million items among each other, of which approximately 3 million were small-caliber items such as ammunition for rifles or pistols, about 2 million were for larger-caliber weapons such as mortars, and about 383,000 were a mixture of other types of ammunition. According to the Office of the Executive Director for Conventional Ammunition's Fiscal Year 2014 Cross-leveling End of Year Report, the potential acquisition cost avoidance achieved in the 2014 cross-leveling process totaled about \$104.2 million. DOD guidance requires that at the end of the annual cross-leveling process, any remaining unclaimed potential reutilization and disposal stock should either be claimed by another military department, recategorized, or designated for disposal, whether through the Defense Logistics Agency Disposition Services Account, or the CAD stockpile, as appropriate.<sup>25</sup>

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## GAO's Prior Work on Ammunition Inventory

We last reported on DOD's management of conventional ammunition in March 2014.<sup>26</sup> We found that the Army's annual stratification report, which

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<sup>23</sup>Through the stratification process, the military departments are directed to, among other things: 1) stratify all conventional munitions inventories to assess the ability of the inventory to meet their needs; 2) keep inventories above needs only if warranted; 3) utilize the stratification process to provide a joint view of assets in the inventory for an extended time or long-supply position; 4) participate in cross-leveling activities to optimize the whole DOD inventory; 5) use cross-leveling activities to offset individual procurements of the military departments in coordination with the Under Secretary of Defense for Acquisition, Technology, and Logistics; 6) proceed with disposal and demilitarization of only those assets that are excess to all DOD needs; and 7) use the individual military service's current year stratification report to acquire or donate long-supply assets from the DOD inventory before procuring or disposing of assets. DOD Manual 4140.01 Volume 6.

<sup>24</sup>Office of the Executive Director for Conventional Ammunition, *Fiscal Year 2014 Cross-leveling End of Year Report*, (Sept. 30, 2014), reported that from 1997 to 2014 DOD avoided \$1.3 billion in procurement costs, which averages out to \$72 million per year.

<sup>25</sup>DOD Manual 4140.01, Volume 6.

<sup>26</sup>GAO, *Defense Logistics: Actions Needed to Improve Department-Wide Management of Conventional Ammunition Inventory*, [GAO-14-182](#) (Washington, D.C.: Mar. 31, 2014).

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shows the status of ammunition inventory at a given point in time, did not include information on all usable ammunition items because it did not include missiles managed by the Army Aviation and Missile Command. Since the Army's missiles were not included in the annual stratification report, they were not considered during the cross-leveling process. Further, we found that items above the services' needs in a prior year that had been placed into the CAD stockpile were not considered in the cross-leveling process. We made recommendations to improve data sharing among the services, and DOD concurred with all of these recommendations. Among our recommendations was to include missiles managed by the Army Aviation and Missile Command in the annual stratification report, and DOD stated that starting with the March 2014 annual stratification meeting the Army would provide missile information for the cross-leveling process. As a result, 100 Javelin missiles were identified for transfer from the Army to the Marine Corps in fiscal year 2015, potentially saving the Marine Corps an estimated \$3 million. Further, we recommended the Army include information on ammunition that in a previous year was unclaimed by another service and had been categorized for disposal. In response, DOD officials stated that all of the military services have visibility into the Army system that tracks ammunition categorized for disposal and they would direct the military services to consider such ammunition in the cross-leveling process. In 2015, the Navy and the Air Force identified materiel worth about \$488,000 in the CAD stockpile from prior years they could use.

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## DOD Maintains Information on Conventional Ammunition, but Some Data Are Incomplete and Information on Excess Is Not Always Shared with Other Government Agencies

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### Incomplete and Inaccurate Data on Excess, Obsolete, and Unserviceable Ammunition Hampers DOD's Ability to Precisely Determine Its Estimated Demilitarization Needs

The services maintain information on their conventional ammunition; however, some inventory records for ammunition in the CAD stockpile have incorrect or incomplete information on its condition and weight.<sup>27</sup> As discussed earlier, each service has its own inventory information system to maintain its conventional ammunition inventory, which includes any unserviceable ammunition or ammunition above its needs in its custody. Consolidated information from the military services on the ammunition in the CAD stockpile is maintained in the Army's Logistics Modernization Program (LMP). DOD Instruction 5160.68 directs the services to provide the SMCA with data on ammunition transferred for demilitarization and disposal operations.<sup>28</sup>

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<sup>27</sup>Inventory records for the CAD stockpile report the total quantity on hand at a particular depot for a specific type of ammunition. Separate records are maintained for the same type of ammunition at each location when that ammunition has different materiel conditions such as serviceable, unserviceable, and suspended. The records also include additional information on the item such as ownership/purpose and demilitarization code. For example, a rocket motor has three records because there are seven of these rocket motors at Crane Army Ammunition Activity that are unserviceable and six that are unserviceable but repairable plus there is one rocket motor at Letterkenny Munitions Center that is unserviceable.

<sup>28</sup>Department of Defense Instruction 5160.68, *Single Manager for Conventional Ammunition (SMCA): Responsibilities of the SMCA, the Military Services, and United States Special Operations Command (USSOCOM)*, (Dec. 29, 2008).



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LMP has information on the location and quantity of all items in the CAD stockpile, but some records have incomplete or incorrect data on condition and weight. Further, according to DOD officials, each item has a condition code assigned to it by the service when placed into the CAD stockpile, and the condition code is not updated while the item is in the stockpile.<sup>29</sup> Service officials stated that when they are considering pulling an item from the stockpile to fill a current need, they generally inspect the condition of the item to determine whether the condition code of the item is still accurate and the item is useable. At times, the services have found particular items with a condition code indicating the materiel was serviceable, but the item's shelf life had expired, while other ammunition had performance issues that made it unacceptable.

Further, we found that DOD does not have the weight data for a number of items in the CAD stockpile.<sup>30</sup> *Standards for Internal Control in the Federal Government* state that an entity should have controls to ensure that all transactions are complete and accurately recorded.<sup>31</sup> In our review of data in the LMP database from 2012 to February 2015 the number of records without assigned weight increased from 2,223 (out of 34,511 records) to 2,829 (out of 36,355 records), which shows the problem is growing. Although some of the records that are missing weight data have very few items in storage, there are several items with significant quantities, such as 3.8 million of chaff countermeasures, 125,000 of 75 millimeter projectiles, and 109,000 of 155 millimeter ammunition.<sup>32</sup>

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<sup>29</sup>Condition codes are used to classify materiel in terms of readiness for issue and use or to identify action underway to change the status of materiel. For example, the materiel can be serviceable and ready to be issued, or unserviceable but repairable. DOD officials stated the Army is not funded to update the condition code of materiel in the CAD stockpile since the materiel in the stockpile is to be demilitarized. The Army does inspect the materiel to ensure it is safe to store.

<sup>30</sup>LMP lists the gross weight of an individual item (shell, missile, or cartridge), however, officials involved in the demilitarization of conventional ammunition use pro-weight, which includes the weight of the item plus its packaging. Pro-weight is used because the demilitarization process has to recycle, or otherwise dispose of all packaging material and containers in addition to destroying the ammunition. The CAD stockpile weights are described in short tons, which is equal to 2,000 lbs.

<sup>31</sup>[GAO/AIMD-00-21.3.1](#).

<sup>32</sup>Chaff is composed of thin, narrow metallic strips of various lengths that can be spread by aircraft in flight, ships at sea, and vehicles on the ground to help them evade enemy radar.

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DOD uses weight data as a metric in managing the demilitarization of conventional ammunition. More specifically, SMCA officials use weight for (1) developing cost estimates for demilitarization projects; (2) determining what conventional ammunition should be demilitarized; (3) reporting the size of the CAD stockpile to the military services, the Office of the Secretary of Defense, and Congress; (4) forecasting the amount of conventional ammunition to be transferred into the CAD stockpile in the future; and (5) reporting on what ammunition has been demilitarized.

The absence of weight data for some of the items in the CAD stockpile understates the size and composition of the CAD stockpile, thereby affecting DOD's estimations of its demilitarization needs. According to DOD officials, the reasons for the missing data in the CAD stockpile are related to the types of items transferred into the stockpile, such as older ammunition stocks that do not have complete weight data, nonstandard ammunition, foreign ammunition used for testing, components removed from larger weapons, and ammunition with records that migrated from legacy data systems.<sup>33</sup> DOD officials stated they are trying to correct current records with missing or inaccurate data, particularly weight. In some cases, such as older stocks, the only solution is to locate and physically weigh the ammunition item(s). DOD officials have not weighed the items because they said it would be costly and labor intensive. However, since the items without weight data are not factored into DOD's demilitarization determination, DOD is not positioned to optimally demilitarize the most ammunition possible with the given resources available. Further, as discussed above, the number of records without weight data has increased over the years, which indicates that SMCA continues to accept materiel into the CAD stockpile without weight data.

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<sup>33</sup>Nonstandard ammunitions are those munitions that have not been safety tested and type classified for use and cannot be procured through the Army supply system. Generally, nonstandard ammunitions do not have a National Stock Number or Department of Defense Identification Code assigned to them and are not in the Defense Supply System.

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## Each of the Services Has Visibility of Serviceable Ammunition in the CAD Stockpile, but Information on Excess Is Not Widely Shared with Other Government Agencies

Officials from all the military services said they have access to LMP and they have used LMP to search the CAD stockpile for materiel they could use, but information on DOD excess is not widely shared with other government agencies such as the Department of Homeland Security, which also uses ammunition for purposes such as training exercises. Specifically, the military services have achieved benefits such as cost avoidances from access to the information in LMP on the CAD stockpile. For example, an Air Force need for 280,000 rounds of 40 millimeter ammunition was met by the remanufacture of Navy 40 millimeter shells drawn from the CAD stockpile, which according to Joint Munitions Command officials saved an estimated \$30 million. Also, the Marine Corps identified the need for signal flares at security check points in Iraq and Afghanistan, so they pulled 95,594 flares out of the CAD stockpile, which according to Marine Corps officials saved the service an estimated \$3.8 million.<sup>34</sup> When the services have been able to fulfill needs by drawing ammunition from the CAD stockpile, financial benefits have arisen both in reduced demilitarization costs over time and reduced new procurements.

DOD also has reduced its demilitarization costs by transferring some excess ammunition to other government agencies as opposed to demilitarizing the ammunition, but has made such transfers only on a limited basis. For example, in fiscal year 2014 DOD provided 38 million rounds of small arms ammunition to the Federal Bureau of Investigation and 7.5 million rounds of small arms ammunition to the U.S. Marshals Service. Officials stated that the Joint Munitions Command and Army Deputy Chief of Staff for Logistics (G-4) used informal methods to communicate with other government agencies on available excess ammunition. Recognizing that there are benefits to such transfers, the Office of the Executive Director for Conventional Ammunition, in its Fiscal Year 2014 Cross-Leveling End of Year Report, included remarks indicating efforts should be made to include other government agencies in the cross-leveling process.

Communicating with other government agencies on available excess ammunition could help reduce the CAD stockpile. Section 346 of the Skelton National Defense Authorization Act, as amended, requires,

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<sup>34</sup> Marine Corps officials said they used these flares from 2003 to 2014 to support their escalation of force procedures at security check points. The least expensive equivalent signal flares cost approximately \$40 each.

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among other things, that serviceable small arms ammunition and ammunition components in excess of military needs not be demilitarized, destroyed, or disposed of unless in excess of commercial demands or certified as unserviceable or unsafe by the Secretary of Defense.<sup>35</sup> Before offering the excess serviceable small arms ammunition for commercial sale, however, this provision outlines a preference that DOD offer the small arms ammunition and ammunition components for purchase or transfer to other Federal government agencies and departments, or for sale to state and local law enforcement, firefighting, homeland security, and emergency management agencies as permitted by law.<sup>36</sup> According to officials, DOD does not have a formal process for offering the excess small arms ammunition and components to other government agencies.

In addition, DOD Manual 4140.01, Volume 6 states that the Secretary of Defense can transfer excess ammunition suitable for law enforcement activities to other federal and state agencies, but the DOD manual does not specify how to facilitate the transfer of the ammunition.<sup>37</sup> In January 2014, we reported that in fiscal year 2013 the Department of Homeland Security reduced its purchase of ammunition. The Department of Homeland Security ammunition purchases are driven primarily by firearm

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<sup>35</sup>The Ike Skelton National Defense Authorization Act for Fiscal Year 2011, Pub. L. No. 111-383, § 346 (2011), as amended by the National Defense Authorization Act for Fiscal Year 2012, Pub. L. No. 112-81, § 361 (2011).

<sup>36</sup>For example, 10 U.S.C. § 2576 provides authorization such that the Secretary of Defense, “under regulations prescribed by him, may sell to State and local law enforcement, firefighting, homeland security, and emergency management agencies, at fair market value, pistols, revolvers, shotguns, rifles of a caliber not exceeding .30, ammunition for such firearms, gas masks, personal protective equipment, and other appropriate equipment which (1) are suitable for use by such agencies in carrying out law enforcement, firefighting, homeland security, and emergency management activities, and (2) have been determined to be surplus property under subtitle I of title 40 and division C (except sections 3302, 3501(b), 3509, 3906, 4710, and 4711) of subtitle I of title 41.”

<sup>37</sup>This manual references 10 U.S.C. § 2576a, under which DOD is permitted to transfer (sell or donate) ammunition to federal or state agencies where the Secretary of Defense determines that the ammunition is “(A) suitable for use by the agencies in law enforcement activities, including counter-drug and counter-terrorism activities; and (B) excess to the needs of the Department of Defense.” The ammunition must also be part of the existing stock of DOD, accepted by the recipient agency on an as-is, where-is basis, transferred without the expenditure of any funds available to DOD for the procurement of defense equipment, and transferred such that all costs incurred subsequent to the transfer of the property are borne or reimbursed by the recipient agency. Finally, there is a stated preference for those applications indicating that the transferred property will be used in counter-drug or counter-terrorism activities of the recipient agency.

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training and qualification requirements. However, due to budget constraints the Department of Homeland Security reduced the number of training classes.<sup>38</sup> If DOD guidance outlining a systematic process to share information on excess ammunition had been in place, the Department of Homeland Security could have possibly been aware of and obtained selected ammunition needed for training classes. *Standards for Internal Control in the Federal Government* states that management should ensure there are adequate means of communicating with, and obtaining information from, external stakeholders that may have a significant impact on the agency achieving its goals.<sup>39</sup> Transfers of ammunition to other government agencies, subject to certain requirements, could support DOD's goal of reducing its CAD stockpile in a manner consistent with section 346 of the Ike Skelton National Defense Authorization Act for Fiscal Year 2011 as amended. Without establishing a systematic means to communicate with and provide other government agencies with information on available excess serviceable ammunition, government agencies could be spending their funds to procure ammunition that DOD has awaiting demilitarization and could provide to them. In addition, without such a means, DOD could miss opportunities to reduce its overall demilitarization and maintenance costs by transferring such ammunition to other government agencies.

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## DOD Has Identified and Taken Actions to Address Challenges in Managing the Demilitarization of Ammunition

DOD has identified a number of challenges in managing the demilitarization of conventional ammunition, and has taken actions to address them. These challenges include compliance with environmental regulations; treaties regarding certain types of ammunition; services' forecasts of excess, obsolete, and unserviceable ammunition; and annual funding.

DOD officials stated they have identified the following challenges and are taking actions to address these challenges:

- Environmental Regulation Compliance: SMCA officials stated they must follow environmental laws in demilitarizing conventional ammunition and their compliance is governed by environmental permits that cover the design and operation of facilities that deal with

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<sup>38</sup>GAO, *Department of Homeland Security: Ammunition Purchases Have Declined Since 2009*, [GAO-14-119](#) (Washington, D.C.: Jan. 13, 2014).

<sup>39</sup>[GAO/AIMD-00-21.3.1](#).

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waste management, noise, air, water, and land emissions.<sup>40</sup> Many munitions are harmful to human health and the environment, and demilitarizing large quantities of ammunition requires the rigorous control and processing of toxic substances. Some of the demilitarization processes generate additional environmental hazards, such as air pollutants and waste water. Figure 2 shows the release of air pollutants from the open burning of munitions. Other demilitarization processes, such as open detonation, generate noise pollution affecting the local community. According to SMCA officials, open burn and open detonation are the primary and cheapest methods to demilitarize conventional ammunition; further, some munitions can only be demilitarized by this process.<sup>41</sup> All seven depots that demilitarize conventional ammunition have the capability to demilitarize ammunition through open burn/open detonation. However, officials stated there are environmental concerns with open burn/open detonation that may force DOD to use alternate and more costly methods of disposal, like closed disposal technology, in the future. For example, officials at one demilitarization facility noted that they generally operated their open detonation demolition ranges at less than 50 percent of capacity (weight of explosive charge) due to air and noise pollution concerns.

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<sup>40</sup>Permits contain site-specific requirements necessary to protect human health and the environment, such as plans to sample and analyze incoming waste, security measures, inspections, personnel training, and groundwater monitoring.

<sup>41</sup>Open burn/open detonation are the intentional combustion or detonation of explosives or munitions, without control or containment of the reaction, and are the preferred method for cost effective demilitarization of many items.

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**Figure 2: Open Burn Destruction of Ammunition**



Source: U.S. Army. | GAO-15-538

According to DOD officials, DOD works to ensure compliance with various environmental regulations by applying for and maintaining permits issued by federal and state agencies that regulate its demilitarization operations. Officials indicated that these permits are granted by federal and state agencies and specify which pollutants can be released and in what quantities, as well as describe in detail how each process controls pollutants and meets applicable standards. If environmental regulations change, DOD officials indicated they may need to renew their permits; if the permits are revised, DOD may be required to fund capital investments in equipment and processes to conform to the requirements of any new permits. SMCA officials stated they address these challenges by including in each annual demilitarization plan sufficient work for each depot to exercise existing environmental permits so the permits do not lapse. Also, they recycle or remanufacture, when possible, materiel that otherwise would be destroyed. Finally, the officials indicated that they contract with private companies to conduct some of the demilitarization work as well.

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- *Treaty Compliance:* The U.S. government is considering two treaties that, if ratified, would significantly impact U.S. demilitarization operations. One treaty is the Convention on Cluster Munitions<sup>42</sup> and the other is the Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on Their Destruction.<sup>43</sup> DOD has an inventory of 471,726 tons of cluster munitions and 23,436 tons of anti-personnel landmines that will have to be disposed of if the United States ratifies the two treaties. Specifically, the conventions require the destruction of the respective cluster munitions and landmines inventories, and to comply, DOD officials stated that they would be forced to prioritize disposal of these

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<sup>42</sup>Cluster munitions, under the Convention, are defined as conventional ammunition that is designed to disperse or release explosive submunitions each weighing less than 20 kilograms [about 44 lbs], and includes those explosive submunitions. The Convention on Cluster Munitions calls for all parties to never use, develop, produce, otherwise acquire, stockpile, retain or transfer to anyone, directly or indirectly, cluster munitions. While signatories are allowed to retain or acquire cluster munitions and explosive submunitions for the development of and training in detection, clearance, or destruction techniques, or for the development of cluster-munition countermeasures, the convention otherwise requires the parties to destroy or ensure the destruction of all cluster munitions as soon as possible, but not later than eight years after the Convention enters into force for that party (although there is an extension request process provided). Finally, the Convention requires that each party to the Convention ensure that such destruction methods comply with applicable international standards for protecting public health and the environment.

<sup>43</sup>Under this Convention, an anti-personnel mine is defined as a mine designed to be exploded by the presence, proximity or contact of a person and that will incapacitate, injure or kill one or more persons. While there is a historical tactical military use for anti-personnel land mines, these weapons have also been used to intimidate and control populations, and landmines left in place after the termination of hostilities are a hazard to civilians. Signatories to the Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on Their Destruction undertake to destroy or ensure the destruction of all anti-personnel mines, except that states may retain or transfer the minimum number of such mines necessary for the development of and training in mine detection, mine clearance, or mine destruction techniques. The Convention requires that parties destroy or ensure the destruction of all stockpiled anti-personnel mines they own, possess, or have under their jurisdiction or control as soon as possible, but not later than four years after the Convention enters into force for that party.



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weapons without concern to maximizing the reduction of the CAD stockpile.<sup>44</sup>

- *Service Forecasts:* SMCA officials said that DOD's demilitarization budget request frequently does not match actual funding needs. The request is based upon the estimated disposal costs required to reduce the existing CAD stockpile, as well as costs for disposing of ammunition the services forecast they will submit for disposal. Each of the services is required to submit a 5-year forecast on the amount of ammunition they expect to turn in for demilitarization each year. However, program officials indicate the services' forecasts are generally inaccurate, which can make demilitarization planning challenging. In 2010, the Army Audit Agency found that Army officials had significantly understated the forecasted annual additions the services would transfer to the CAD stockpile from 2005 to March 2009, and these estimates were based on the projections furnished by the services.<sup>45</sup> The Army Audit Agency recommended the Joint Conventional Ammunition Policies and Procedures 7 (Demilitarization and Disposal) be revised to help the military services develop better forecasts for additions to the stockpile. In their 2013 follow-up report, the Army Audit Agency found that the Joint Conventional Ammunition Policies and Procedures 7 (Demilitarization and Disposal) had been revised in 2011; however, the forecast additions for fiscal year 2012 were still inaccurate.<sup>46</sup> SMCA officials told us that they still received inaccurate forecast information from the services. The SMCA officials stated they have no control over the ammunition the services actually

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<sup>44</sup>Secretary of Defense Memorandum, *DOD Policy on Cluster Munitions and Unintended Harm to Civilians*, (June 19, 2008), called for the Armed services after 2018 to only employ cluster munitions containing submunitions that, after arming, do not result in more than 1 percent unexploded ordnance across the range of intended operational environments. Further, the policy directs removal from the active inventory of all cluster munitions that exceed operational planning requirements or for which there are no operational planning requirements. Such cluster munitions are to be demilitarized as soon as practicable within available funding and industrial capacity. The SMCA has started to demilitarize cluster munitions and land mines by including them in the annual demilitarization plan.

<sup>45</sup>U.S. Army Audit Agency, *Funding Requirements for the Conventional Ammunition Demilitarization Program*, Audit Report No. A-2010-0134-FFE, (Alexandria, Va.: July 16, 2010).

<sup>46</sup>U.S. Army Audit Agency, *Followup Audit of Funding Requirements for the Conventional Ammunition Demilitarization Program* (Project: A-2013-IEE-0146.000), Report: A-2014-0023-IEE, (Fort Belvoir, Va.: Dec. 16, 2013).

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transfer year to year, and they accept all excess, obsolete, and unserviceable conventional ammunition into the CAD stockpile, even if it exceeds forecasts. DOD officials stated they do not have options to address any problems caused by unplanned additions to the CAD stockpile, although DOD recalculates the demilitarization plan to include the additional ammunition when appropriate.

- *Annual Funding:* SMCA officials stated that the Army requests less funding than needed to meet its critical requirement each year, which could result in the CAD stockpile growing if the amount of ammunition demilitarized is less than the amount of ammunition transferred from the services during the year. The critical requirement is the funding necessary to demilitarize 3 percent of the existing stockpile and the full amount of ammunition the services plan to add to the CAD stockpile during the year.<sup>47</sup> In December 2013, Army Audit Agency reported the Army Deputy Chief of Staff for Logistics (G-4) estimated the critical funding level for the demilitarization of conventional ammunition at approximately \$185 million.<sup>48</sup> Further, the report stated that the conventional ammunition demilitarization program is considered a lower priority when compared to other needs. The Department of the Army's budget request for conventional ammunitions demilitarization in fiscal year 2015 was \$114 million and for fiscal year 2016 it was \$113 million.<sup>49</sup> Officials stated that the amount of funding has caused them to be reluctant to initiate projects that increase demilitarization capacity or efficiency, since these capabilities may not be utilized in the future due to funding shortfalls. Furthermore, officials state they lack Research, Development, Test, and Evaluation (RDT&E) funding to develop demilitarization processes for the disposal of some materiel in the CAD stockpile that cannot be demilitarized using current processes, but they expect these funds will be increased in fiscal year 2017.<sup>50</sup> SMCA addresses

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<sup>47</sup>DOD officials explained the 3 percent critical requirement is actually a goal they aim to achieve as opposed to a requirement they must meet.

<sup>48</sup>U.S. Army Audit Agency, *Followup Audit of Funding Requirements for the Conventional Ammunition Demilitarization Program (Project: A-2010-0134-FFE), Report: A-2014-0023-IEE*, (Fort Belvoir, Va.: Dec. 16, 2013).

<sup>49</sup>*Department of Defense Fiscal Year (FY) 2016 President's Budget Submission, Army Justification Book, Procurement of Ammunition, Army* (February 2015).

<sup>50</sup>Joint Munitions Command officials state that there is ammunition in the CAD stockpile for which they have no established demilitarization method. The Program Executive Office Ammunition requests RDT&E funds to develop methods to demilitarize these items.

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the funding challenge each year by developing an annual demilitarization plan to dispose of as much of the CAD stockpile as it can based on the amount of funding they receive.

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## DOD's Average Cost to Store, Maintain, and Dispose of Excess, Obsolete, and Unserviceable Conventional Ammunition

DOD officials have estimated the average cost to store, maintain, and dispose of excess, obsolete, and unserviceable conventional ammunition. DOD officials stated that in fiscal year 2015, it costs on average about \$42 per ton to store conventional ammunition. This number was determined using the estimated cost to perform annual inventory counts, surveillance inspections of ammunition, and housekeeping movement of stocks to manage the storage space. Additionally, DOD officials stated that in fiscal year 2015, it costs on average about \$2,000 per ton to demilitarize conventional ammunition.<sup>51</sup> This cost is driven by the quantities and the complexity of the items being demilitarized. DOD has not conducted a formal analysis comparing the costs of storing excess, obsolete, and unserviceable conventional ammunition with the costs of its demilitarization and disposal. Based on our review of key DOD conventional ammunition demilitarization guidance, there is no requirement to conduct a cost comparison. DOD officials told us that since there is a large difference in the cost to store and the cost to demilitarize ammunition based on their estimates, they believe there is no need to conduct a formal analysis. Further, DOD officials stated their mission is to demilitarize all conventional ammunition in the CAD stockpile and the annual decisions on what to demilitarize are based on achieving that goal. For information on how SMCA officials determine what conventional ammunition to demilitarize, see appendix IV.

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## Conclusions

Efficient management of the CAD stockpile and DOD's demilitarization effort is important to ensure that as much hazardous material is disposed of as possible using the resources available. In order to meet its goals, the department needs accurate data, which requires complete and accurate documentation of the items transferred into the stockpile each year by the services, as well as ammunition already in the stockpile. *Standards for Internal Control in the Federal Government* state that an entity should have controls to ensure that all transactions are complete and accurately recorded. DOD does maintain data on conventional

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<sup>51</sup>We did not independently validate the \$42 storage costs or the \$2,000 demilitarization costs.

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ammunition in the stockpile and uses it to manage demilitarization efforts, but officials have not fully maintained accurate and complete weight data on some ammunition items, which factors into their decision making about what to demilitarize in a given year. Without complete and accurate data, DOD is not well positioned to make the best demilitarization decisions and to use demilitarization resources as efficiently as possible. Furthermore, efficient management of the CAD stockpile is not solely a matter of demilitarization, since some materiel in it potentially could be transferred to other agencies, in keeping with DOD regulations and statutory requirements. Such transfers could allow DOD to reduce demilitarization costs and the size of the CAD stockpile while also reducing the need for other government agencies to procure new stocks of ammunition. While at times transfers have led to cost savings, there has not been a formal means to regularly communicate with external stakeholders about the availability of excess ammunition in the stockpile, which is necessary to meet DOD's goals. Without a systematic means to communicate information on excess ammunition to other government agencies, DOD will miss opportunities to reduce the CAD stockpile and demilitarization costs through transfers.

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## Recommendations for Executive Action

To improve the efficiency of DOD's conventional demilitarization efforts, including systematically collecting and maintaining key information about the items in its CAD stockpile and sharing information on excess items with other government agencies, we recommend that the Secretary of Defense direct the Secretary of the Army to take the following two actions.

- To improve the completeness and accuracy of information on the weight of items in the CAD stockpile—the key measure used by DOD to manage the conventional ammunition demilitarization operation—establish a plan to (1) identify and record, to the extent possible, the missing or inaccurate weight information for existing ammunition records in the CAD stockpile and (2) ensure that all items transferred to the CAD stockpile, including for example components removed from larger weapons and nonstandard ammunition, have the appropriate weight data.
- To improve the visibility and awareness of serviceable excess ammunition in the CAD stockpile that could potentially be transferred to other government agencies, develop a systematic means to make information available to other government agencies on excess ammunition that could be used to meet their needs.

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## Agency Comments

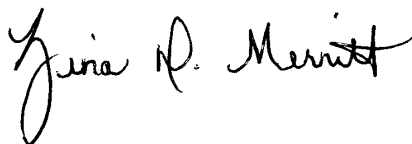
We provided a draft of this report to DOD for review and comment. In its written comments, reproduced in appendix V, DOD concurred with both of the recommendations. DOD also provided technical comments on the draft report, which we incorporated as appropriate.

DOD concurred with our first recommendation that the Secretary of the Army establish a plan to (1) identify and record, to the extent possible, the missing or inaccurate weight information for existing ammunition records in the CAD stockpile and (2) ensure that all items transferred to the CAD stockpile, including for example components removed from larger weapons and nonstandard ammunition, have the appropriate weight data. DOD stated that Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics would ensure that the Secretary of the Army is tasked to identify and record, to the extent practicable, weight data for the existing CAD stockpile and for items transferred to the CAD stockpile in the future. In response to our second recommendation that the Secretary of the Army develop a systematic means to make information available to other government agencies on excess ammunition that could be used to meet their needs, DOD stated that Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics would ensure that the Secretary of the Army is tasked to develop a systematic means to make information available to other government agencies on excess ammunition.

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We are sending copies of this report to the appropriate congressional committees, the Secretary of Defense; the Secretaries of the Army, the Navy, and the Air Force; and the Commandant of the Marine Corps. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff has any questions about this report, please contact me at (202) 512-5257 or [merrittz@gao.gov](mailto:merrittz@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff members who made key contributions to this report are listed in appendix VI.



Zina D. Merritt  
Director, Defense Capabilities and Management

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*List of Committees*

The Honorable John McCain  
Chairman  
The Honorable Jack Reed  
Ranking Member  
Committee on Armed Services  
United States Senate

The Honorable Mac Thornberry  
Chairman  
The Honorable Adam Smith  
Ranking Member  
Committee on Armed Services  
House of Representatives

The Honorable Thad Cochran  
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The Honorable Richard Durbin  
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Subcommittee on Defense  
Committee on Appropriations  
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The Honorable Rodney Frelinghuysen  
Chairman  
The Honorable Pete Visclosky  
Ranking Member  
Subcommittee on Defense  
Committee on Appropriations  
House of Representatives

# Appendix I: Guidance on Managing Demilitarization Operations

## Officials Stated Current Policies and Procedures Are Sufficient to Manage Demilitarization Operations

The Department of Defense (DOD) has policies and procedures that help govern the demilitarization of excess, obsolete, and unserviceable conventional ammunition and DOD officials involved in the demilitarization of conventional ammunition stated they believe the policies and guidance issued are effective to govern demilitarization. Additionally, depots have used the policies and guidance to develop their own implementing guidance and standard operating procedures for use at their locations. For example, Tooele Army Depot developed a letter of instruction for the inspection and disposal of inert material and Crane Army Ammunition Plant has developed several standard operating procedures to govern the base’s demilitarization processes. The table below provides an overview of key DOD policies on demilitarization.

**Table 1: Overview of Key Department of Defense Guidance on Conventional Ammunition**

Guidance	Policy Description	Key Elements
Department of Defense (DOD) Directive 5160.65 Single Manager for Conventional Ammunition (SMCA) August 1, 2008	Assigns the SMCA mission to the Secretary of the Army and authorizes development and publication of implementing joint conventional ammunition policies and procedures by the SMCA, the Military Departments, and U.S. Special Operations Command.	<ul style="list-style-type: none"> <li>The Secretary of the Army shall execute the SMCA mission within the Department of Defense.</li> <li>The SMCA shall “centrally manage and fund the demilitarization and disposal of conventional ammunition in the CAD stockpile.”<sup>a</sup></li> <li>The SMCA shall prepare an SMCA charter, in coordination with the Military Departments, to be approved by the Under Secretary of Defense for Acquisition, Technology, and Logistics. The charter shall establish the manner in which the responsibilities and authorities assigned to the SMCA shall be executed.</li> </ul>
DOD Instruction 5160.68 Single Manager for Conventional Ammunition (SMCA): Responsibilities of the SMCA, the Military Services, and United States Special Operations Command (USSOCOM) December 29, 2008	Implements DOD Directive 5160.65 by specifying the functional responsibilities and mission functions to be performed by the Secretary of the Army or designee as SMCA, and by the Military Services, and U.S. Special Operations Command customers on conventional ammunition management actions.	<ul style="list-style-type: none"> <li>The SMCA is responsible for demilitarization and disposal of all conventional ammunition, including non-SMCA managed items, for which capability, technology, and facilities exist to complete demilitarization and disposal.<sup>b</sup></li> <li>The SMCA, Military Service, and USSOCOM customers shall jointly develop and distribute joint conventional ammunition policies and procedures through the Joint Ordnance Commanders Group.</li> <li>The SMCA shall plan, program, and budget for a demilitarization and disposal program for all munitions in the CAD stockpile.</li> <li>The SMCA shall develop an annual comprehensive demilitarization and disposal plan.<sup>c</sup></li> <li>The Military Services and USSOCOM shall provide an annual 5-year forecast of conventional ammunition generations into the CAD stockpile to support the development of the SMCA demilitarization and disposal plan, as well as fund the movement of assets from retail sites to sites specified by the SMCA for demilitarization and disposition, and coordinate these shipments with the receiving sites.</li> </ul>

**Appendix I: Guidance on Managing  
Demilitarization Operations**

<b>Guidance</b>	<b>Policy Description</b>	<b>Key Elements</b>
SMCA Charter May 21, 2015	Establishes the roles and functions of Department of the Army organizations that have responsibility for the SMCA mission.	<ul style="list-style-type: none"> <li>The SMCA mission, as outlined in DOD Directive 5160.65, is to perform DOD conventional ammunition mission functions, as defined in DOD Instruction 5160.68. One of the specific mission functions is demilitarization and disposal.</li> <li>The Assistant Secretary of the Army (Acquisitions, Logistics, and Technology) designated Program Executive Office Ammunition as the SMCA Executor and delegated those authorities necessary to execute the SMCA mission. The SMCA Executor is responsible for the overall execution of the U.S. Army's SMCA mission. In addition, the SMCA Executor has overall responsibility for the execution of Procurement of Ammunition Army related funding.</li> <li>The SMCA Field Operating Activity (designated as Joint Munitions Command) is responsible for providing logistics and sustainment support to the SMCA Executor and the Military Services, including conducting demilitarization and disposal.</li> <li>The Headquarters Army Directorate, G-4 is the Army staff proponent responsible for programming and budgeting for the demilitarization resources necessary to accomplish the SMCA mission.</li> </ul>
Joint Conventional Ammunition Policies and Procedures 7 Demilitarization and Disposal September 4, 2012	Outlines procedures and interfaces among the SMCA and the Military Services to ensure optimum performance of the conventional ammunition demilitarization and disposal program.	<ul style="list-style-type: none"> <li>SMCA key responsibilities are:               <ul style="list-style-type: none"> <li>Request by October 15 of each year, a 5-year forecast from the Military Services of conventional ammunition, components and propellant, explosives, and pyrotechnics they expect to transfer to the CAD stockpile.</li> <li>Develop implementation guidance and priorities for demilitarization operations.</li> </ul> </li> <li>Military Service key responsibilities are:               <ul style="list-style-type: none"> <li>Provide to the SMCA by the end of each calendar year, a 5-year forecast of the conventional ammunition they expect to transfer to the CAD stockpile.</li> <li>Notify the SMCA of any current-year un-forecasted need to transfer excess, obsolete, or unserviceable assets.</li> </ul> </li> </ul>

Source: GAO Analysis of DOD guidance | GAO-15-538

**Notes:**

<sup>a</sup>The stockpile of conventional ammunition awaiting demilitarization and disposal is known as the CAD stockpile.

<sup>b</sup>Non-SMCA items are those items assigned specifically to the Military Departments and U.S. Special Operations Command for management and include such items as naval mines, torpedoes, and guided projectiles.

<sup>c</sup>The annual demilitarization and disposal plans developed by the services are a 5-year forecast of conventional ammunition they expect to transfer to the CAD stockpile.



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DOD's Directives,  
Instructions, Manuals, and  
Charter on the  
Demilitarization of  
Conventional Ammunition  
Conform with DOD  
Instruction on Issuances

DOD Instruction 5025.01, *DOD Issuances Program*, establishes guidance for directives, instructions, manuals, and charters such as frequency of updates, length, purpose, and appropriate approval level.<sup>1</sup> The guidance documents we reviewed in the table above conform to the requirements under DOD Instruction 5025.01:

- DOD Instruction 5025.01 provides that directives, instructions, and manuals (issuances) published before March 25, 2012 should be updated or cancelled within 10 years of their publication date, and that those published or changed after that date will be processed for cancellation by the Directives Division on the 10-year anniversary of their original publication dates, unless an extension is approved. That said, even for those issuances not required to be cancelled within 10 years, an issuance is not considered current when it is not within 10 years of its publication date. The directives, instructions and manuals we reviewed in the table above conformed to this requirement. For example, DOD Directive 5160.65, *Single Manager for Conventional Ammunition (SMCA)* was published on August 1, 2008. Therefore, it is not required to be updated or cancelled until August 2018.
- DOD Instruction 5025.01 provides that directives should not be more than 10 pages in length (including enclosures, with no procedures, and with the exception of charters); instructions not more than 50 pages (including enclosures) or they should be divided into volumes; and manuals should be divided into two or more volumes if more than 100 pages are required. The directives, instructions, and manuals we reviewed in the table above were within the established parameters. For example, DOD Instruction 5160.68 is 21 pages, which is within the required maximum limit of 50 pages for instructions not divided into multiple volumes.
- DOD Instruction 5025.01 requires that DOD directives exclusively establish policy, assign responsibility, and delegate authority to the DOD Components. Directives will not contain procedures. DOD instructions either implement policy or establish policy and assign responsibilities, and may provide general procedures for carrying out or implementing those policies. DOD manuals provide detailed procedures for implementing policy established in instructions and

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<sup>1</sup> Department of Defense Instruction 5025.01, *DOD Issuance Program*, (June 6, 2014, incorporating Change 1, effective Oct. 17, 2014).

directives. The directives, instructions, and manuals we reviewed in the table above established and implemented policy as required. For example, DOD Instruction 5160.68 assigns responsibilities and mission functions for conventional ammunition management to the Secretary of the Army, the military services, and USSOCOM.

- DOD Instruction 5025.01 states that, generally, directives are to be signed by the Secretary of Defense or Deputy Secretary of Defense. Depending on the nature of the instruction, instructions must be signed by the component head in the Office of the Secretary of Defense, his or her Principal Deputy, or Office of the Secretary of Defense Presidentially-appointed, Senate-confirmed official. Manuals must be signed by an individual in one of these positions, as authorized by their chartering directives. The directives, instructions, and manuals we reviewed in the table above were signed by the appropriate officials. For example, DOD Directive 5160.65 was appropriately signed by the Deputy Secretary of Defense.
- DOD Instruction 5025.01 states that charters must define the scope of functional responsibility and identify all delegated authorities for the chartered organization. The SMCA charter defines responsibility and authorities, for example, by delegating to the Deputy Commanding General for Army Materiel Command the role of Executive Director for Conventional Ammunition and provides authorities as needed to execute the SMCA mission.

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# Appendix II: Objectives, Scope, and Methodology

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To assess the extent to which the Department of Defense (DOD) has adequately maintained and shared information on the quantity, value, condition, and location of excess, obsolete, and unserviceable conventional ammunition for each military service, we reviewed DOD's inventory data on excess, obsolete, and unserviceable conventional ammunition held in the conventional ammunition awaiting demilitarization and disposal (CAD) stockpile as of February 2015 to determine how complete and accurate the data are.<sup>1</sup> The scope of the audit was limited to the materiel in the CAD stockpile and ammunition in the services' inventory that was unserviceable or in excess of the services' needs.<sup>2</sup> We interviewed Army, Navy, Marine Corps, and Air Force officials to determine how they manage unserviceable ammunition and serviceable ammunition that is beyond the services' needs. We also determined the extent to which the information in the services' ammunition inventory systems is useful for their purposes. We interviewed Single Manager for Conventional Ammunition (SMCA) and service officials to learn how information on excess, obsolete, and unserviceable ammunition is shared.<sup>3</sup> After initial discussions with DOD officials, we determined that the department does not consider the value of ammunition in the management of its CAD stockpile so we did not review the value of the conventional ammunition. Further, we conducted a data reliability assessment of the Air Force Combat Ammunition System, the Navy's Ordnance Information System, the Marine Corp's Ordnance Information System – Marine Corps, and the Army's Logistics Modernization Program by reviewing the services' responses to questionnaires on the internal controls they use to manage their systems. We applied *Standards for*

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<sup>1</sup>The data on the conventional ammunition awaiting demilitarization were obtained from the Army's Logistics Modernization Program (LMP). February 2015 data were the most recent available at the time of this report.

<sup>2</sup>DOD officials stated that for ammunition to be incorporated into the CAD stockpile it must be received into one of the depots located within the United States. Any excess, obsolete, or unserviceable ammunition located outside the United States was not included in this audit.

<sup>3</sup>U.S. Special Operations Command and the military services are required to comply with DOD policies on conventional ammunition. However, an official with the U.S. Special Operations Command indicated that the U.S. Special Operations Command does not manage excess, obsolete, and unserviceable ammunition. If any of the special operations force units have ammunition that is unserviceable or above their needs, the special operations force units contact their military service for disposition instructions. Therefore, U.S. Special Operations Command was not included in the scope of this performance audit.

*Internal Control in Federal Government* as our criteria, and found that the data was sufficiently reliable for determining whether DOD adequately maintained information on the quantity, value, condition, and location of excess, obsolete, and unserviceable conventional ammunition in its accounts and for our reporting purposes.<sup>4</sup> The questions we sent the services solicited information on the controls they had implemented in their ammunition information systems. The questions seek to determine if there were controls that restricted access to the information system to prevent unauthorized access or inappropriate use and that there were data quality controls that ensured completeness, accuracy, authorization, and validity of all transactions. We interviewed service officials in the Army, Navy, Air Force, and Marine Corps to learn how ammunition is managed once the decision is made to demilitarize and transfer it to the CAD stockpile. We also interviewed officials on the visibility, accessibility, accuracy, and usefulness of the data on the CAD stockpile and determine if they have identified problems regarding the reliability of the data. Lastly, we reviewed policies and legislation to determine what guidance was provided on communicating excess conventional ammunition to other government agencies, and we interviewed SMCA officials about the extent to which they communicate the availability of excess ammunition to other government agencies and the challenges involved with making conventional ammunition available to government entities outside of DOD.

To examine challenges, if any, DOD has identified in managing the current and anticipated CAD stockpile, and if so, actions taken to address those challenges, we reviewed DOD reports on the management of the current CAD stockpile to identify any problem areas and DOD's plans to address these problems. We visited McAlester Army Ammunition Plant and examined the management of its ammunition demilitarization operation to include storage practices and a variety of methods to destroy the ammunition. We selected McAlester Army Ammunition Plant to visit because a large portion of the CAD stockpile was stored there, and it used several methods to demilitarize ammunition. We also contacted the other six depots that store and demilitarize ammunition and requested the same information on the management of their respective ammunition

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<sup>4</sup>GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#), (Washington, D.C.: Nov. 1999).

demilitarization operations.<sup>5</sup> We interviewed SMCA officials and officials in the Army, Navy, Air Force, and Marine Corps to identify challenges they face in managing the stockpile and discuss the actions they have taken to address the challenges.

To describe DOD's average costs of storing and maintaining items in the CAD stockpile and the average costs of the disposal of items in the stockpile, we obtained fiscal year 2015 cost estimates for storing and demilitarizing ammunition from the Army Materiel Command's Joint Munitions Command, and interviewed officials about what factors were used to develop these cost estimates. We also reviewed a 2013 DOD report on the cost of demilitarizing conventional ammunition to determine the factors that drive demilitarization costs. Additionally, we interviewed Army officials on the process they use to make demilitarization decisions.

To describe DOD's policies and procedures governing the demilitarization of excess, obsolete, and unserviceable conventional ammunition and discuss the extent to which they are consistent with DOD guidance for developing policies and procedures, we obtained policies, procedures, and guidance on demilitarization. We determined that these policies, procedures, and guidance would be considered adequate if they conformed to DOD guidance on directives and instructions. Therefore, we compared the requirements in DOD Instruction 5025.01, with the guidance governing demilitarization of conventional ammunition and determined whether DOD followed this instruction on how guidance documents should be developed and how often they should be updated.<sup>6</sup> To determine the extent to which DOD policies and procedures on demilitarization of conventional ammunition are effective, we interviewed officials in the Army and contacted the demilitarization depots to obtain their opinions on the effectiveness and usefulness of DOD policies and procedures governing the demilitarization of conventional ammunition.

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<sup>5</sup>DOD has seven depots that stores and demilitarize the CAD stockpile. They are Crane Army Ammunition Activity, Tooele Army Depot, Hawthorne Army Depot, McAlester Army Ammunition Plant, Anniston Munitions Center, Blue Grass Army Depot, and Letterkenny Munitions Center. Additionally, DOD has five other locations that store a small portion of the CAD stockpile, less than 2 percent in total, and they are Holston Army Ammunition Plant, Iowa Army Ammunition Plant, Pine Bluff Arsenal, Radford Army Ammunition Plant, and Milan Army Ammunition Plant.

<sup>6</sup>Department of Defense Instruction 5025.01, *DOD Issuances Program*, (June 6, 2014, incorporating Change 1, effective Oct. 17, 2014).

We visited or contacted the following offices during our review. Unless otherwise specified, these organizations are located in or near Washington, D.C.

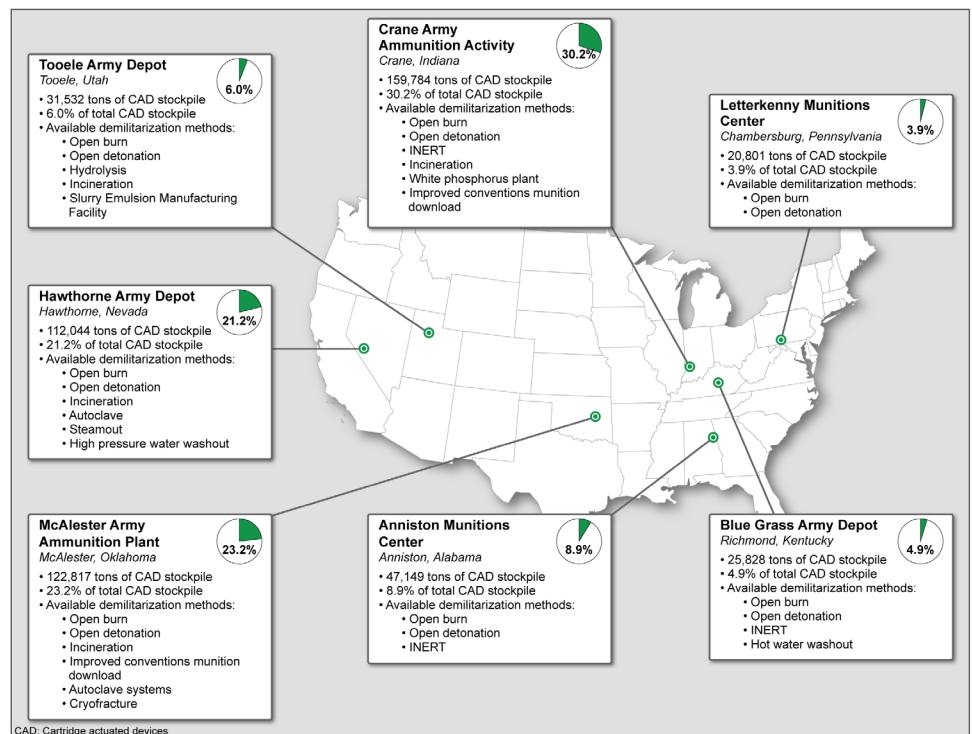
- Office of the Under Secretary of Defense for Acquisition, Technology and Logistics
- U.S. Special Operations Command, Tampa, Florida
- Defense Logistics Agency
- Program Executive Office for Ammunition, Dover, New Jersey
- Office of the Executive Director for Conventional Ammunition, Dover, New Jersey
- Office of the Assistant Secretary of the Army (Acquisition, Logistics and Technology)
- Headquarters, Department of the Army, Army Deputy Chief of Staff for Logistics (G-4)
- U.S. Army Materiel Command, Huntsville, Alabama
- U. S. Army Joint Munitions Command, Rock Island, Illinois
- U.S. Army Aviation and Missile Command, Huntsville, Alabama
- McAlester Army Ammunition Plant, McAlester, Oklahoma
- Office of the Chief of Naval Operations, Director for Material Readiness & Logistics (N4)
- Naval Supply Systems Command, Mechanicsburg, Pennsylvania
- U. S. Marine Corps Headquarters
- U.S. Marine Corps Systems Command, Quantico, Virginia
- U.S. Air Force Headquarters
- U.S. Air Force Life Cycle Management Center Readiness, Ogden, Utah

We conducted this performance audit from August 2014 to July 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

# Appendix III: Army Depot Locations and Demilitarization Capabilities

The Army has seven demilitarization locations that store 98 percent of the conventional ammunition awaiting demilitarization and disposal (CAD) Stockpile.<sup>1</sup> Figure 3 below shows these seven demilitarization locations, the amount of the CAD stockpile at those locations, and the demilitarization capabilities at each location.

**Figure 3: Army Demilitarization Locations, Conventional Ammunition Awaiting Demilitarization and Disposal (CAD) Stockpile Quantities, and Demilitarization Capabilities as of February 2015**



Source: GAO analysis of Army data. | GAO-15-538

<sup>1</sup>Additionally, as of February 2015 DOD has five other locations that store the other 2 percent of the CAD stockpile: Holston Army Ammunition Plant (7 tons), Iowa Army Ammunition Plant (1,356 tons), Pine Bluff Arsenal (4,713 tons), Radford Army Ammunition Plant (104 tons), and Milan Army Ammunition Plant (3,239 tons). We did not include these locations in the map since no demilitarization is conducted at these sites.

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Key Terms Associated with  
the Demilitarization  
Processes

1. Autoclave - Autoclave capability removes and reclaims main charge cast explosives (such as TNT) from projectiles and bombs. Munitions are prepared for the autoclave by disassembly or cutting to expose the main explosive charge. They are placed in the autoclave and the vessel is heated using steam. As the munitions body heats up, the explosive melts and flows to the bottom of the autoclave for collection in heated kettles.
2. Hot Water Washout - Washout capability removes and reclaims main cast explosive charges from projectiles, bombs, and mines. Munitions are prepared for washout by disassembly to expose the main explosive charge. Munitions are placed over a washout tank where low-pressure hot water is injected into the cavity to wash out the explosives into a recovery tank.
3. Cryofracture - Cryofracture involves the cooling of the munitions in a liquid nitrogen bath, followed by fracture of the embrittled item(s) in a hydraulic press and the subsequent thermal treatment of the fractured munitions debris in order to destroy the explosives and decontaminate any residual metal parts.
4. Hydrolysis – Hydrolysis uses a sodium hydroxide solution to dissolve the aluminum casing and expose the energetic materials contained within. The sodium hydroxide solution then reacts with the energetic materials, breaking them down and rendering them inert.
5. Improved Munitions Convention Download – Joint Munitions Command officials describe this as a process developed to demilitarize artillery projectiles that contain submunitions, which are small bombs. The base plate of the projectile is removed to access the submunitions and they are removed for disposition on the open detonation range. The metal parts including the projectile body and base plate are often reused in the manufacture of new rounds.
6. Incineration - Incineration provides an environmentally acceptable means to destroy munitions not suitable for other demilitarization methods and reclaim the metal scrap for sale. Small munitions and/or components are fed on conveyor(s) into the incinerator where they burn or detonate. Metal residues are discharged and collected for salvage.
7. INERT – According to Joint Munitions Command officials, INERT is the shredding, cutting, or mutilation of munitions items, components, or packaging that do not contain energetic materials.



8. Open Burn/Open Detonation - Open burn and open detonation are the intentional combustion or detonation of explosives or munitions, without control or containment of the reaction, and are the preferred method for cost-effective demilitarization of many items. Open burn and open detonation techniques were the primary means used to demilitarize munitions for several decades.

9. Slurry Emissions Manufacturing Facility – According to Joint Munitions Command officials this facility combines energetic material recovered from munitions items with other commercial ingredients to produce blasting charges the mining industry uses.

10. Steamout - Steamout is similar to hot water washout in that both processes essentially melt out energetic fillers in large-caliber projectiles, bombs, and other munitions. With the steamout process, items are placed on an inclined cradle, and steam is jetted in to melt out the fill. The molten slurry is collected and sent to corrugate cooling pans. The pans are held in a vented and heated hood until the water is all evaporated and the explosive solidifies. The solidified explosive is broken into chunks, boxed, and then according to Joint Munitions Command officials, used as donor material for open detonation projects.

11. White Phosphorus Plant - The White Phosphorus-Phosphoric Acid Conversion Plant provides an environmentally acceptable means to demilitarize munitions containing white phosphorus by converting it into phosphoric acid. The munitions are punched to expose the white phosphorus and quickly burned. Smoke from the burning munitions is pulled through a closed loop ducting system into the wet scrubber in the acid plant system for conversion to phosphoric acid. The phosphoric acid is collected and packaged for sale. Metal parts are discharged and collected for salvage.

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# Appendix IV: DOD Processes to Determine the Ammunition to Demilitarize

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To determine what conventional ammunition should be demilitarized, Joint Munitions Command officials stated they use a database tool called the Demilitarization Optimizer.<sup>1</sup> To develop an annual demilitarization plan, the optimizer produces an initial list of projects, in tons, that will result in demilitarizing the most ammunition possible based on factors entered into the optimizer. Officials stated they use the optimizer as a starting point in developing the annual demilitarization plan; they make adjustments to the optimizer output to maintain demilitarization capability at the depots and to balance the work load over the years. For the demilitarization of missiles, Army Aviation and Missile Command officials stated they do not use the optimizer because they prepare their plan using the number of missiles; however, they consider many of the same factors in determining what missiles to demilitarize in a given year.

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## Process to Determine What Non-Missile Ammunition to Demilitarize

The optimizer is a database tool used to determine the ammunition, with the exception of missiles, that will be demilitarized, given certain parameters (e.g., inventory, depot capability and capacity, funding, transportation costs, and any mandatory workload requirements). The optimizer has been used by Joint Munitions Command since 1999 as a tool to assist in demilitarization program planning, provide justification to answer questions received from Congress as well as Army headquarters, and provide the most economic allocation of resources among the government depots. Further, the optimizer provides Joint Munitions Command with an auditable trail of decision making and an ability to provide a quick response to “what if” questions. The optimizer database uses several data points to determine what items should be demilitarized:

1. Demilitarization inventory and forecasted additions to the CAD stockpile – the amount of ammunition currently in the CAD stockpile and the estimated amount of ammunition that the services determine they will add to the stockpile that year.
2. Depot capability, capacity, and costs of carrying out demilitarization – depot capability is the type of demilitarization work the depot has the ability to conduct. For example, most of the depots have the capability to conduct demilitarization through open burn and open detonation. Depot capacity is the amount of work that the depot has the ability to conduct by demilitarization capability. For example, Letterkenny Munitions Center has the capacity to demilitarize 3,500 tons of

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<sup>1</sup>We refer to the Demilitarization Optimizer as the “optimizer” throughout this appendix.

ammunition each year by open burn and 1,250 tons by open detonation. The cost of carrying out demilitarization is an estimate, prepared by the depot, of the cost to demilitarizing specific ammunition using a particular demilitarization capability. Data on storage costs is not entered into the optimizer for cost calculations.

3. Funding – the amount of funding available for demilitarization based on the current fiscal year budget allocation.
4. Packing, crating, handling, and transportation – the cost of moving ammunition to the appropriate demilitarization location.
5. Mandatory workloads – any directives or management initiatives that would change the priority of demilitarization work that must be conducted. For example, if the United States signed the Convention on Cluster Munitions, DOD would be required to demilitarize all cluster munitions within 8 years.<sup>2</sup> This information would be entered into the optimizer to ensure the treaty requirement would be met.

Joint Munitions Command officials cautioned that there are some inherent uncertainties in the optimizer process that affect the outcome. One of the uncertainties is the incoming workload. While Joint Munitions Command has an estimate of how much inventory will be generated each year for demilitarization, the estimates are not perfect and leave uncertainty in the quantity of items that will be turned over for demilitarization and the time at which those items will enter the CAD stockpile. Joint Munitions Command officials stated that the optimizer provides a good starting point for decision-making, based on the specific parameters described above, but they do not assign demilitarization projects based solely on the optimizer output.

Officials stated that the optimizer produces a list of projects, based on tons, that would be most economical to demilitarize for that given year. However, adjustments are made to balance complex, expensive

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<sup>2</sup>Cluster munitions are bombs, rockets, and artillery shells that disperse small submunitions over broad areas and sometimes fail to explode initially, later injuring or killing noncombatants. The Convention on Cluster Munitions calls for a prohibition of cluster munitions use, development, production, acquisition, stockpiling, or transfer. While signatories are allowed to retain or acquire cluster munitions for training in detection, clearance, and destruction techniques, or for countermeasure development, the convention otherwise requires the complete destruction of all cluster munitions not later than eight years after the convention enters into force.

demilitarization projects with simple, inexpensive demilitarization projects. Since the optimizer attempts to maximize the amount of conventional ammunition demilitarized, it tends to recommend a number of inexpensive projects. This results in pushing the expensive demilitarization projects into the future, which may increase future demilitarization costs. Therefore, to maintain a balance between future demilitarization funding needs and the current funding provided for demilitarization, officials replace some of the inexpensive projects the optimizer recommends with expensive projects.

Additionally, officials make adjustments to the optimizer results to ensure each depot is provided sufficient work to maintain demilitarization capabilities. Officials are concerned that if they do not provide some work to each of the depots, the depots would lose their demilitarization capability because some processes require specialized skills or training and retaining those personnel would be impossible if demilitarization was curtailed for a significant amount of time. The loss of trained personnel would create a significant deficit in training and delay the restart of any future demilitarization operations. Further, officials are concerned they risk losing their environmental permits if demilitarization operations were stopped at an installation for a significant amount of time. For fiscal year 2015, the Joint Munitions Command and Program Executive Office for Ammunition officials stated they planned a demilitarization program of about \$71 million, which would destroy about 67,640 tons of ammunition.

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## Process for Determining Missile Demilitarization

Demilitarization officials at the Aviation and Missile Command stated they use similar factors in determining what missiles to demilitarize, including the location of the missiles, the capabilities and capacity of the depots, the estimated cost to demilitarize, and the funding available. Officials stated the Aviation and Missile Command does not use the optimizer tool, but instead the demilitarization officials coordinate with Product Manager Demilitarization to develop an annual missile demilitarization execution plan.<sup>3</sup> In addition to the factors listed above, officials also consider the

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<sup>3</sup> Within the Program Executive Office for Ammunition, the Product Manager for Demilitarization was established to centralize responsibility and provide acquisition management for the DOD conventional ammunition demilitarization programs. The Product Manager for Demilitarization performs demilitarization life-cycle management of conventional ammunition for DOD. The Product Manager for Demilitarization is part of the Program Executive Office for Ammunition organization at Picatinny Arsenal, New Jersey and is subordinate to the Project Director for Joint Services.

safety inspections that have been conducted on each missile and push any potentially unsafe-to-store items to the top of the demilitarization list. While Aviation and Missile Command demilitarization officials do not currently use an optimizer tool, they stated that they are considering whether an optimizer database would be feasible for use with missiles. For fiscal year 2015, the Aviation and Missile Command and Program Executive Office Ammunition officials stated they planned a demilitarization program of about \$43 million, which would destroy about 141,598 missiles and components.

# Appendix V: Comments from the Department of Defense



ACQUISITION

ASSISTANT SECRETARY OF DEFENSE  
3015 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3015

JUN 23 2015

Ms. Zina D. Merritt  
Director, Defense Capabilities and Management  
U.S. Government Accountability Office  
441 G Street, N.W.  
Washington, DC 20548

Dear Ms. Merritt:

This is the Department of Defense (DoD) response to the GAO Draft Report, GAO-15-538, "DEFENSE LOGISTICS: Improved Data and Information Sharing Could Aid in DoD's Management of Ammunition Categorized for Disposal," dated June 3, 2015 (GAO Code 351971). Detailed comments on the report recommendations are enclosed.

We appreciate the opportunity to comment on the draft report. Should you have any questions, please contact Mr. Stefan Tretiak, Office of the Deputy Assistant Secretary of Defense for Tactical Warfare Systems, at [stefan.p.tretiak.civ@mail.mil](mailto:stefan.p.tretiak.civ@mail.mil) or 703-695-0376.

Sincerely,

  
Katharina McFarland

Enclosure:  
As stated

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**GAO DRAFT REPORT DATED JUNE 3, 2015  
GAO-15-538 (GAO CODE 351971)**

**“DEFENSE LOGISTICS: IMPROVED DATA AND INFORMATION SHARING  
COULD AID IN DOD'S MANAGEMENT OF AMMUNITION CATEGORIZED FOR  
DISPOSAL”**

**DEPARTMENT OF DEFENSE COMMENTS  
TO THE GAO RECOMMENDATION**

**RECOMMENDATION 1:** The GAO recommends that the Secretary of Defense direct the Secretary of the Army, to improve the completeness and accuracy of information on the weight of items in the CAD stockpile – the key measure used by DoD to manage the conventional ammunition demilitarization operation, establish a plan to (1) identify and record, to the extent possible, the missing or inaccurate weight information for existing ammunition records in the CAD stockpile; and (2) ensure that all items transferred to the CAD stockpile, including for example components removed from larger weapons and nonstandard ammunition, have the appropriate weight data.

**DoD RESPONSE:** Concur. OUSD(AT&L) will ensure that the Secretary of the Army is tasked to identify and record, to the extent practicable, weight data for the existing CAD stockpile and for items transferred to the CAD stockpile in the future.

**RECOMMENDATION 2:** The GAO recommends that the Secretary of Defense direct the Secretary of the Army, to improve the visibility and awareness of serviceable excess ammunition in the CAD stockpile that could potentially be transferred to other government agencies, develop a systematic means to make information available to other government agencies on excess ammunition that could be used to meet their needs.

**DoD RESPONSE:** Concur. OUSD(AT&L) will ensure that the Secretary of the Army is tasked to develop a systematic means to make information available to other government agencies on excess ammunition.

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# Appendix VI: GAO Contact and Staff Acknowledgments

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## GAO Contact

Zina D. Merritt, (202) 512-5257 or [merrittz@gao.gov](mailto:merrittz@gao.gov)

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## Staff Acknowledgments

In addition to the contact named above, Carleen Bennett (Assistant Director), George Bustamante, Lindsey Cross, Chaneé Gaskin, Kevin Keith, Carol Petersen, Michael Silver, Amie Steele, Alexander Welsh, Erik Wilkins-McKee, and Michael Willems made key contributions to this report.



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