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## Audit of Ammunition and Explosives Management



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## **Acronyms and Abbreviations**

A&E	Ammunition and Explosives
ADM(IE)	Assistant Deputy Minister (Infrastructure and Environment)
ADM(IM)	Assistant Deputy Minister (Information Management)
ADM(Mat)	Assistant Deputy Minister (Materiel)
ADM(RS)	Assistant Deputy Minister (Review Services)
AESI/AESS	Ammunition and Explosives Safety Inspection and Survey
AIMS	Ammunition Information and Maintenance System
AP	Ammunition Program
APOC	Ammunition Program Oversight Committee
CJOC	Canadian Joint Operations Command
DAER	Director Ammunition and Explosives Regulation
DAOD	Defence Administrative Orders and Directives
DND/CAF	Department of National Defence/Canadian Armed Forces
DRMIS	Defence Resource Management Information System
EWM	Enhanced Warehouse Management
FY	Fiscal Year
OPI	Office of Primary Interest
OCI	Office of Collateral Interest
SJS	Strategic Joint Staff
SLOC	Storage Locations

## Results in Brief

The management of ammunition and explosives (A&E) within the Department of National Defence and the Canadian Armed Forces (DND/CAF) is significant given the strategic nature of this resource, which is used in the conduct of deployed missions and in support of operational readiness. Many organizations within DND/CAF are involved in the Ammunition Program (AP), which is facilitated by the Ammunition Program Oversight Committee (APOC). A&E inventory is valued at \$3.3 billion, accounting for 57 percent of DND/CAF's and 48 percent of the Government of Canada's total inventory holdings.

### Findings and Recommendations

**Governance.** Many DND/CAF organizations have a role in the AP. However, there is no single overarching document to define the roles, responsibilities and authorities of all stakeholders. In particular, the absence of clearly defined roles and responsibilities for the Strategic Joint Staff (SJS) represents a gap in the governance structure. This affects the establishment of strategic direction and integration of the AP. Defining the roles and responsibilities of SJS will require close collaboration with the numerous other AP stakeholders in order to avoid creating gaps or overlaps in the governance structure. It is recommended that SJS, with input from relevant stakeholders, distinguish, define and communicate the roles, responsibilities and authorities of all organizations involved with the AP.

The governance structure would also benefit from a formalized performance management framework to assess results, ensure accountability and drive improvements. It is recommended that SJS complete the development and implementation of a performance management framework for the AP.

**Optimizing Inventory Holdings.** Optimizing the level of A&E inventory is important to avoid holding too much inventory, which could increase storage and program costs, or holding too little inventory, which could cause supply shortfalls and affect operational readiness. To optimize the Department's A&E inventory holdings, effective planning of the procurement of A&E inventory is necessary given that it is not readily available as an off-the-shelf product. However, the Department's planning efforts are currently fragmented, and requirements are not fully established or substantiated. Therefore, it is recommended that SJS establish substantiated A&E inventory requirements by coordinating and formalizing planning efforts within DND/CAF.

Similarly, disposal of A&E inventory in a timely manner is essential to reduce the accumulation of inventory and associated storage costs and to allow for the use of optimal disposal methods before A&E becomes unstable. Although the Department has attempted to contract disposal capabilities, these efforts did not materialize, resulting in a lack of capabilities (i.e., equipment and resources) to conduct disposal of A&E inventory in a timely and effective manner. Given the

### Overall Assessment

Improvements in the management of A&E in the following areas would facilitate the achievement of program objectives:

- defining authorities of all stakeholders;
- coordinating planning and disposal efforts;
- resolving discrepancies, and implementing a solution to the use of parallel systems; and
- refining the safety compliance reporting mechanism.

long-term nature of acquiring the required capabilities, it is recommended that Assistant Deputy Minister (Materiel) (ADM(Mat)) develop and implement a plan to acquire the capabilities for the disposal of surplus, obsolete and end-of-lifecycle A&E inventory in an effective and timely manner.

**Information Management.** The Department's use of two information systems to manage A&E does not facilitate informed decision making due to functionality limitations and data that is not complete or accurate. While one is the official system of record, the other manages highly technical information. The use of parallel systems creates a duplication of effort, and the lack of system integration or automatic reconciliation causes discrepancies to persist for extended periods. Data that is incomplete or inaccurate affects decision making and the Department's ability to report accurate inventory information on its financial statements.

It is recommended that, in the short term, SJS, in coordination with all stakeholders that store A&E inventory, implement an initiative to identify and resolve the discrepancies between the Ammunition Information and Maintenance System (AIMS) and the Defence Resource Management Information System (DRMIS) by reviewing and comparing all A&E inventory records in both systems and performing the necessary adjustment transactions on a regular basis. It is also recommended that Assistant Deputy Minister (Information Management) (ADM(IM)), in coordination with SJS and ADM(Mat), develop and implement an information technology solution with adequate controls that would ensure the completeness and accuracy of A&E information while addressing the current systems' functionality limitations, user requirements and an automated reconciliation of A&E inventory records.

**Safety.** The current inspection process to assess compliance with safety requirements is appropriate, but the reporting of observations and overall status requires improvement. The policy does not require the inspecting authority to record a subsequent observation if corrective action plans are not implemented by the time of the following inspection. This results in an overstated status in the inspection report that does not accurately portray the safety conditions at the A&E facility or support the timely resolution of outstanding issues. It is recommended that Director Ammunition and Explosives Regulation (DAER) update and communicate guidance to track, assess and report on outstanding corrective action plans such that deficiencies are resolved on a timely basis and the overall status of the Ammunition and Explosives Safety Inspection and Survey (AESI/AESS) accurately reflects the safety conditions of A&E facilities.

**Inventory Control.** The internal processes for the issuances from and returns to depots and warehouses, as well as the expenditure and adjustment of A&E inventory, are managed appropriately, with some minor exceptions. Sufficient guidance has recently been developed and made available for the receipting process, in which the inventory purchase price and quantity is manually recorded. As a result, a recommendation for these inventory control processes was not deemed necessary.

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**Note:** Please refer to [Annex A—Management Action Plan](#) for the management response to the Assistant Deputy Minister (Review Services) (ADM(RS)) recommendations.

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## 1.0 Introduction

### 1.1 Background

A&E is considered a military commodity that directly contributes to the delivery of operational outcomes, CAF readiness and the conduct of deployed missions. The AP manages A&E within DND/CAF by striving to achieve the following three main strategic outcomes:<sup>1</sup>

- effectively manage ammunition as a commodity such that it is delivered to the right place at the right time in the right quantity, and that it is of the right design and quality to support CAF operations and training;
- effectively manage ammunition support capabilities<sup>2</sup> to meet CAF requirements now and in the future; and
- provide accountability over AP resources to ensure inventories and capital assets are accurately accounted for across the system.

The AP has been restructured multiple times, and managed with varying degrees of centralization and decentralization over the last several decades. The current AP uses a decentralized structure, resulting in multiple organizations having a role in the program. An oversight committee is in place to facilitate the strategic integration, monitoring and optimization of all elements of the AP.

### 1.2 Rationale

A&E's purpose is to achieve destruction or some violent effect, and can cause serious bodily harm and death, or damage and loss of materiel and facilities. A&E is a tactical resource that is not only used in CAF operations but also to train CAF personnel, which contributes to operational readiness.

At the end of fiscal year (FY) 2016/17, the A&E inventory was valued at \$3.3 billion, representing 57 percent of the Department's total inventory holdings and 48 percent of the Government of Canada's holdings. Weakness in the management of departmental A&E could, therefore, have an impact on the *Public Accounts of Canada*.

Additionally, the management of A&E has not been reviewed or assessed by ADM(RS) in the past ten years. Previous coverage of this area includes the 2007 Evaluation of the Munitions Supply Program and Evaluation of DND/CF Ammunition Acquisition Program, as well as the 2005 Evaluation of DND/CF Ammunition Safety Program.

The hazardous nature of this military commodity, the materiality of these assets and the lack of recent audit coverage prompted the selection of this topic for audit in the Risk-Based Internal Audit Plan for FYs 2016/17 to 2018/19.

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<sup>1</sup> APOC Terms of Reference, April 4, 2014.

<sup>2</sup> Ammunition support capabilities refer to supporting services such as human resources, information systems, equipment and infrastructure.



### 1.3 Objective

The objective of the audit was to assess whether governance processes facilitate the achievement of AP objectives, and whether appropriate and effective materiel management controls exist for departmental A&E.

### 1.4 Scope

The scope of this audit included the governance processes and accountability structure currently in place, as established by the Ammunition Program Restructure initiative in 2014. While the audit did not seek to assess the design effectiveness of these processes and structures (including the APOC and its working groups), the audit did assess whether the current structure has been effectively implemented in support of achieving established AP objectives. The audit scope also included financial management processes, materiel management processes, compliance processes and the use of information systems to manage A&E. This audit included ammunition holdings and expenditure data from FY 2014/15 to FY 2015/16 for the purposes of data and sample analysis.

While forming part of the AP, the scope of this audit did not include an assessment of the following:

- A&E stored in foreign countries for deployed operations;
- A&E managed by the Canadian Special Operations Forces Command;
- the transportation and proper usage of A&E;
- the effectiveness of A&E physical security controls;
- ammunition infrastructure management and planning;<sup>3</sup>
- the process of determining A&E requirements for training, contingency and operations;<sup>4</sup>
- the recruitment, training and retention of personnel working with ammunition;
- the management of unexploded explosive ordnance sites; and
- contracting and vendor selection for A&E.

The conduct period of this audit took place from July 2016 to March 2017.

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<sup>3</sup> SJS and Assistant Deputy Minister (Infrastructure and Environment) (ADM(IE)) are currently conducting a study on the requirements for ammunition facilities, which will drive a long-term plan.

<sup>4</sup> As part of the Defence Renewal initiative, a study is being conducted on ammunition requirements, and defining the methodology to determine how much A&E is required for contingency and operations.



## 1.5 Methodology

The audit approach included the following:

- interviews with individuals in key positions of ammunition-related processes and subject matter experts at all levels of the AP;
- reviews of relevant policies, orders and directives, documentation provided by clients and reports of related previous audits, reviews and inspections;
- walkthroughs of key A&E processes;
- analyses of A&E holdings and expenditure data extracted from DRMIS and AIMS;
- site visits to Canadian Forces Ammunition Depots in Dundurn, Saskatchewan and Bedford, Nova Scotia; warehouse facilities at 14 Wing and 405 Squadron in Greenwood, Nova Scotia and the Canadian Forces Base and training centre in Wainwright, Alberta; and storage areas in Her Majesty's Canadian Ship *Montréal*; and
- testing of sample files and transactions related to A&E processes.

## 1.6 Audit Criteria

The audit criteria can be found at [Annex B](#).

## 1.7 Statement of Conformance

The audit findings and conclusions contained in this report are based on sufficient and appropriate audit evidence gathered in accordance with procedures that meet the Institute of Internal Auditors' *International Standards for the Professional Practice of Internal Auditing*. The audit thus conforms to the Internal Auditing Standards for the Government of Canada as supported by the results of the quality assurance and improvement program. The opinions expressed in this report are based on conditions as they existed at the time of the audit and apply only to the entity examined.

## 2.0 Findings and Recommendations

### 2.1 Governance

Roles, responsibilities and accountabilities of major stakeholders are not clearly defined or communicated, creating some gaps and potential overlaps in the governance structure that do not facilitate the sound management of the AP. Additionally, the current performance management practices are insufficient to ensure accountability and drive ongoing improvements to the AP.

After much evolution over the last several decades, the most recent restructuring initiative established a decentralized program that differentiates the strategic from the operational and tactical functions in the management of A&E. As a result, there are numerous stakeholders and organizations with a role in the AP as outlined in Table 1.

	AP Roles	Responsible Senior Advisors <sup>5</sup>
<b>Strategic Functions</b>	Program Integration	SJS
	Regulatory Framework and Safety Program	DAER
	Materiel Management	ADM(Mat)
<b>Operational and Tactical Functions</b>	A&E Safety	Canadian Joint Operations Command (CJOC) and Environmental Chiefs of Staff <sup>6</sup>
	A&E Storage/Warehousing	CJOC Environmental Chiefs of Staff
	A&E End-Users	CJOC Environmental Chiefs of Staff
	A&E Information Systems	ADM(IM)
	A&E Infrastructure	ADM(IE)
	A&E Human Resources and Training	SJS Chief Military Personnel Assistant Deputy Minister (Human Resources – Civilian) Environmental Chiefs of Staff

**Table 1. AP Stakeholder Roles.** This table describes the AP roles, the responsible senior advisor and whether the role is a strategic or operational and tactical function.

Meeting on a semi-annual basis, the APOC oversees the AP, and is supported by several working groups. Membership includes key personnel from relevant stakeholder organizations, which facilitate the strategic integration, monitoring and optimization of the program. The primary focus of APOC is to assist the various senior advisors with decision support and advice as it

<sup>5</sup> The responsible senior advisor is the Level 1 organization that reports directly to the Deputy Minister and/or the Chief of the Defence Staff, with the exception of DAER. Although DAER administratively reports to ADM(Mat), the organization functionally reports to the Deputy Minister and the Chief of the Defence Staff.

<sup>6</sup> The Environmental Chiefs of Staff are the Commanders of the Canadian Army, Royal Canadian Air Force and Royal Canadian Navy.

affects performance of and risks to the AP. It facilitates a collaborative forum to enable the cross-functional coordination and monitoring of the AP elements. While the committee does not direct efforts or manage A&E, it is co-chaired by two key decision makers, who are representatives from ADM(Mat) and SJS at the General Officer level and can influence decisions within their respective organizations. This provides stakeholders the ability to offer input and exercise influence on the strategic-level management of the AP.

### **2.1.1 Governance Framework**

A successful governance framework requires effectively managing the boundaries between the strategic, operational and tactical functions, while operating with a level of unity and coordination to achieve the objectives of the AP. This requires clear documentation and communication of roles, responsibilities, authorities and accountabilities of all stakeholders involved in the program, particularly considering the complexity of the AP. The Defence Administrative Orders and Directives (DAOD) policy framework assigns the functional authorities for the senior advisors responsible for each of the three strategic functions, as follows:

- SJS is the functional authority for AP performance (added to the policy in January 2017).
- DAER is the functional authority for A&E regulation and safety.
- ADM(Mat) is the functional authority for materiel acquisition and support, materiel management and inventory management, materiel assurance<sup>7</sup> and procurement and contracting.

With the responsibility for strategic functions of the AP divided between three different senior advisors, as well as the oversight provided by the APOC, it is important that the roles, responsibilities and authorities for strategic direction and program integration be clearly defined. This information is currently set out in multiple policies, directives, plans and reports that need to be examined together in order to determine the roles, responsibilities and authorities of the numerous stakeholders with a role in the AP. The AP Precip, the A&E section of the Supply Administration Manual<sup>8</sup> and DAOD 3002-0 – Ammunition and Explosives are examples of documents that provide information on the governance structure of the AP. However, even taken together, these documents do not fully outline the roles, responsibilities and authorities of all stakeholders. Most notably, the role of SJS, a relatively newer organization, has not been fully defined.

As a result, the responsibility for the strategic direction and integration of the AP is unclear, creating a gap in the governance framework. While the definition of SJS' roles and responsibilities is needed to effectively incorporate it into the governance framework of the AP, it is also necessary to reformulate the roles of other stakeholders to ensure coordination and alignment. Close collaboration between stakeholders in defining roles, responsibilities and authorities is recommended to avoid creating gaps or overlaps.

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<sup>7</sup> Materiel assurance is the responsibility for the safe and effective operation of equipment through design, engineering, maintenance and overhaul services.

<sup>8</sup> The Supply Administration Manual is the Department's main materiel management policy that outlines detailed guidance for all materiel acquisition and support processes.

### 2.1.2 Performance Management

Current performance management practices consist of general updates provided by stakeholders at APOC meetings, which do not necessarily include reports on results or performance.

Additionally, stakeholders are unable to measure and report on results or performance without established metrics, targets or baselines. Overall, current practices are insufficient to ensure accountability or to drive ongoing improvements to the AP.

In accordance with its functional authority, SJS is currently developing a performance management framework.

Although still in draft form, it appears to be well designed, having all the key components of a performance measurement strategy as defined in relevant Treasury Board Secretariat guidance. The draft framework includes elements such as defined objectives, outcomes and indicators, a measurement and reporting methodology, an evaluation strategy and the performance metrics' link to departmental objectives.

#### Good Practice

APOC meetings have adopted a systematic format that enables the monitoring of all elements of the AP, each of which has an assigned office of primary interest (OPI).

### 2.1.3 Conclusion

Despite the substantial number of organizations involved, no overarching document defines and distinguishes each stakeholder's roles, responsibilities and authorities with respect to the AP. Most significantly, existing policies, guidance and AP documentation do not reflect the roles, responsibilities and authorities of SJS, who only received its assigned functional authority for AP performance in January 2017. The potential resulting gaps and overlaps in the governance framework could affect the ability of stakeholders to meet program objectives. Additionally, a performance management framework is required to allow the AP to measure whether objectives are met, ensure accountability and drive ongoing improvements to the program.

#### ADM(RS) Recommendation

1. It is recommended that SJS, with input from relevant stakeholders, distinguish, define and communicate the roles, responsibilities and authorities of all organizations involved with the AP.

This is to include the following:

- Define the roles, responsibilities and authorities of SJS as related to the AP.
- Document the roles of all organizations involved with the AP and how they support each other in a central source document.

**OPI:** SJS

### ADM(RS) Recommendation

2. It is recommended that SJS complete the development and implementation of a performance management framework for the AP.

OPI: SJS

## 2.2 Optimizing Inventory Holdings

The planning of A&E holdings is not optimized in the absence of established and substantiated target inventory levels. Additionally, difficulties in acquiring capabilities have led to delays in the disposal of A&E inventory.

### 2.2.1 Inventory Holdings

Military A&E is not readily available for purchase and may have long production lead times, requiring the Department to effectively plan its purchasing strategy to fulfil the requirements of the CAF. Although there is uncertainty inherent in the process, determining and maintaining target inventory levels for A&E to support operational readiness are essential aspects of the planning process that inform strategic decisions regarding inventory holdings. Setting target inventory levels for A&E is, therefore, crucial to ensuring that a sufficient supply is always available. However, the results of a sample analysis showed that target inventory levels were not set for 14 out of 34 sampled A&E items.<sup>9</sup> Furthermore, the items with set targets were not supported with sufficient substantiation. This results from A&E requirements not being established or appropriately substantiated.

Current departmental efforts to improve the planning of A&E inventory purchases include a study by SJS (as part of the Defence Renewal initiative), on ammunition requirements that also seeks to define the methodology for determining how much A&E the CAF requires. A working group under APOC was also recently established, with a mandate to set out justified requirements to support tasks and readiness levels for all categories of A&E. However, it will take time to realize its impact on resolving ongoing issues with requirements planning.

### 2.2.2 Disposal

Disposal is the removal of materiel from inventory that is surplus, obsolete or at the end of its life. Departmental policy requires disposal to be both timely and effective. Appropriate lifecycle management and timely disposal of A&E are necessary to optimize inventory holdings and to reduce safety risks of ammunition becoming unstable over time. Two percent of the total A&E inventory is categorized as “for disposal” and “awaiting disposal instructions,” and it has been categorized as such since 2010. Although not the sole custodian of inventory awaiting disposal, CJOC reports that disposal inventory occupies roughly 35,000 square metres of depot storage space, accounting for roughly \$6.2 million in depot storage costs per year.

Despite efforts made to address A&E disposal, the Department does not have the highly specialized capabilities required to conduct disposal of A&E in a timely manner. The process of

<sup>9</sup> Examples of A&E items include small arms ammunition, missiles, torpedoes, explosive devices and pyrotechnics.

developing and/or acquiring disposal capabilities is not only expensive but also lengthy. ADM(Mat) is preparing a business case on the required capabilities for different types of A&E and the cost of acquiring them. However, due to the decentralized governance structure of the AP, it is unclear which organization is responsible for developing and funding these capabilities. In the current organizational structure, the environmental commands establish the requirements for A&E and determine when it is ready for disposal, ADM(Mat) purchases the inventory and prepares the disposal instructions, while CJOC stores the inventory and conducts the physical disposal of inventory.

### 2.2.3 Conclusion

The Department's planning efforts are currently fragmented and incomplete, which can potentially lead to procuring too much or too little inventory. Even if departmental policy were updated to require setting target inventory levels, this would not be possible without establishing substantiated A&E requirements. Inventory levels below set targets present a risk of supply shortfalls for operational requirements that could negatively impact operational readiness. Conversely, inventory levels in excess of requirements create an unnecessary redundancy in stock quantities.

Despite a great deal of departmental effort, difficulties in acquiring disposal capabilities have resulted in delays in the disposal of A&E inventory. This can lead to an accumulation of inventory and increased storage and program costs, requiring additional time, effort and resources to develop the disposal capability. Additionally, A&E inventory awaiting disposal for an extended period can become unstable, resulting in the use of suboptimal methods of disposal to mitigate the risk of danger, damage and injury.

#### ADM(RS) Recommendation

3. It is recommended that SJS establish substantiated A&E inventory requirements by coordinating and formalizing planning efforts within DND/CAF.

OPI: SJS

#### ADM(RS) Recommendation

4. It is recommended that ADM(Mat) develop and implement a plan to acquire the capabilities for the disposal of surplus, obsolete and end-of-lifecycle A&E inventory in an effective and timely manner.

OPI: ADM(Mat)

## 2.3 Information Management

The information systems that support A&E management, DRMIS and AIMS, do not contain complete and accurate data, and their functionality limitations do not support timely and informed decision making.

The ammunition community within DND/CAF uses two primary information systems, DRMIS and AIMS. DRMIS, the Department's official system of record, is managed by ADM(IM) and has had many users in the ammunition community since FY 2014/15. AIMS, on the other hand, is a stand-alone system that replaced the use of paper ammunition data cards.<sup>10</sup> It is managed by the Strategic J4 Ammunition section under SJS and has been used since 2000.

While DRMIS is an accounting system used to track the movement of A&E and holds general storage information, AIMS' main purpose is to manage pertinent technical information required by ammunition technicians. This includes information such as detailed storage locations, manufacturer lot numbers and expiry dates, as well as requirements for the safe handling, warehousing, expending and disposing of A&E inventory. This information is not available in DRMIS. Since the two systems are not connected, duplication of effort exists in the recording of information in both systems. Specifically, users must record the receipt, issue, return, adjustment and stocktaking processes in both systems.

### **2.3.1 Completeness and Accuracy of Information**

The audit team conducted data analysis<sup>11</sup> and found that the A&E information held in DRMIS and AIMS is not complete or accurate. When comparing stock numbers of A&E items, only 64 percent have records in both systems, of which only 83 percent have matching quantities. Furthermore, the audit team encountered several examples of how the current systems do not meet user requirements, demonstrating that neither system contains complete A&E information. The systems' functionality limitations included the inability to adhere to various policy requirements, resulting in the need for manual processes, the ability for unauthorized users to make changes to inventory records, and the additional effort required to go back and forth between the two systems to gain an understanding of A&E information.

The Department has used the two systems to manage A&E inventory for over ten years instead of an overall system with sufficient functionality. Although a working group within SJS is currently identifying a solution to the use of these parallel systems, none exists yet. Manually entering transactions into both systems because of the lack of system integration increases the risk of errors. Separately entering data into both systems requires duplicate effort and creates discrepancies between the systems. Additionally, the manual recording of purchase information, including the unit prices of A&E, is susceptible to human error.

The lack of automatic reconciliation between DRMIS and AIMS further increases the risk of errors. A major mitigating control to reconcile the quantities in both systems occurs during scheduled stocktaking, as required by departmental policy. Stocktaking ensures that physical holdings are correctly recorded in DRMIS and AIMS. Investigations are conducted for discrepancies found, and necessary adjustments are recorded in both systems. Another mitigating control is ad-hoc checks performed by depot and warehouse staff, who compare inventory quantities in both systems, investigate discrepancies and record the necessary adjustments.

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<sup>10</sup> An ammunition data card is a permanent record containing ammunition information, such as lot number, manufacturer, quantity, date manufactured, technical specifications and revisions.

<sup>11</sup> The A&E information used for this data analysis is from all four ammunition depots (Angus, Bedford, Dundurn and Rocky Point) and three of the largest ammunition warehouses (Bagotville, Cold Lake and Wainwright) from FY 2015/16.



Although the sites visited were conducting the needed stocktaking activities, both stocktaking and ad-hoc checks are manual forms of reconciliation and are insufficient to ensure accuracy of inventory information in both systems. The discrepancies identified in the audit are indicative of the reconciliation errors that are likely to persist in the current two-system environment.

### **2.3.2 Conclusion**

Overall, incomplete and inaccurate inventory data does not support informed decision making, and can cause the Department to incur additional costs. It also affects the Department's ability to report accurate inventory information in the financial statements. Furthermore, undetected changes to inventory by unauthorized users can interrupt planned operations and training exercises, and increase the risk of inappropriate and unauthorized use. Given that developing and implementing an information technology solution can take a long time, an initiative to clean up A&E inventory records in both systems is required in the interim.

#### **ADM(RS) Recommendation**

5. It is recommended that, in the short term, SJS, in coordination with all stakeholders that store A&E inventory, implement an initiative to identify and resolve the discrepancies between AIMS and DRMIS by reviewing and comparing all A&E inventory records in both systems and performing the necessary adjustment transactions on a regular basis.

**OPI:** SJS

#### **ADM(RS) Recommendation**

6. It is recommended that ADM(IM), in coordination with SJS and ADM(Mat), develop and implement an information technology solution with adequate controls that would ensure the completeness and accuracy of A&E information, while addressing the current systems' functionality limitations, user requirements and automated reconciliation of A&E inventory records.

**OPI:** ADM(IM), in coordination with SJS and ADM(Mat)

### **2.4 Safety**

The AESI/AESS is an appropriate tool to monitor compliance with safety requirements. However, the reports do not always accurately reflect the state of A&E safety or support the timely resolution of outstanding issues.

The AESI/AESS is a fundamental cornerstone of the regulatory compliance program for reporting on the state of A&E safety across DND/CAF. DAER, as the functional authority for A&E regulation and safety, manages the process. Currently, the regulatory compliance assessed through the AESI/AESS focuses on operations support and readiness. However, DAER is in the process of expanding its compliance framework to cover all elements of the AP using a risk-based approach.

The Ammunition and Explosives Safety Manual is the major policy document that provides detailed guidance on the AESI/AESS process, including its purpose, scope, responsibilities, types of inspections, frequency and reporting requirements. The safety manual also contains several tools and templates with instructions for the inspectors. One such tool is the observation sheet, which is used to record details of issues found during an inspection. The template includes the following sections: observation, policy reference(s), action required, corrective action plan and planned implementation date.

#### **Good Practice**

In the “Action Required” section of the observation sheet, the Royal Canadian Air Force inspector asks for root cause identification.

### **2.4.1 Reporting**

Current reporting practices need improvement to accurately capture the state of safety at A&E depots and warehouses. The policy does not require the inspecting authority to record a subsequent observation if a corrective action plan is incomplete at the time of the following inspection, unless the situation has deteriorated further. The related tests on the inspection checklist receive a full score, resulting in the overall AESI/AESS status being overstated, which does not reflect the true state of safety at that facility.

Given how often corrective action plans do not meet implementation dates, it is important to accurately capture and report the state of safety at A&E facilities. A sample analysis of 39 corrective action plans from five facilities found that 12 (31 percent) did not meet the planned implementation dates. The reasons varied from resource limitations (i.e., finances and personnel) and changes in local priorities to unresolved infrastructure work orders.

In two separate examples, the covering letters for the AESI/AESS reports identified that infrastructure issues from the previous inspection had not been resolved. Yet the inspecting authorities awarded a full score for the infrastructure-related tests on the checklist in both cases. In another example, the inspecting authority identified a subsequent observation as “ongoing,” where the corrective action plan to repair the infrastructure of one building was not yet complete. It was included in the report to track and measure if the situation deteriorated further, but it was not included in the overall status since implementation would take a long time. In all three cases, the overall AESI/AESS status did not accurately reflect the state of safety at these facilities.

In addition to ongoing observations of corrective action plans that are not fully implemented, there are cases of recurring observations, which most reports do not distinguish. However, a good practice was noted in some reports that identified recurring observations within the observation sheets. Furthermore, in the absence of fully implemented corrective action plans, facilities do not document or report the implementation of any interim mitigating measures. DAER asserts, with several examples, that A&E facilities always implement interim measures to minimize safety risks and ensure that facilities are always safe. For example, when a barricade or infrastructure of an A&E facility is damaged, the total A&E held in that building is reduced to mitigate the risk of a safety incident. If the electrical security alarm of a building is defective, physical patrols are continually conducted to mitigate the risk of theft or fraud. However, these examples were not documented in the associated AESI/AESS reports given that the policy and report template do not require the documentation of mitigation strategies.

### Good Practice

The inspectors for the Royal Canadian Air Force and Canadian Forces Base Wainwright highlight recurring observations in cases where corrective action plans have not been fully implemented.

## 2.4.2 Conclusion

In order to avoid penalizing the depots and warehouses for action plan items that are outside of their control, the policy does not require a subsequent observation when a corrective action plan is not fully implemented. However, this practice overstates the status and does not accurately portray the state of safety at A&E facilities. The current reporting practice also limits the visibility and tracking of previously identified observations and unresolved issues. The backlog and delays in resolving identified observations could lead to higher costs of mitigating further disrepair, physical patrols to protect physical security of A&E, personal harm and mismanagement of inventory.

DAER's annual report provides a summary of the Department's aggregate status, which, if overstated, shows fewer areas of concern and provides reduced visibility of ongoing issues. Accurate measurement of the compliance and state of safety is essential for DAER in its role as the functional authority for A&E safety and in its functional reporting relationship to the Deputy Minister and the Chief of the Defence Staff.

### ADM(RS) Recommendation

7. It is recommended that DAER update and communicate guidance to track, assess and report on outstanding corrective action plans such that deficiencies are resolved on a timely basis and the overall status of the AESI/AESS accurately reflects the safety conditions at A&E facilities.

**OPI:** DAER

## 2.5 Inventory Control

Inventory control processes are generally in place and well managed to properly account for inventory.

Several processes encompass the proper accounting for inventory, including the receipt of inventory at depots, internal issues, returns and consumption of A&E and adjustment transactions. Although the stocktaking process is an inventory control contributing to the proper accounting for inventory, it was only assessed in its objective as a reconciliation method, as previously explained in Section 2.3 – Information Management.

A&E is not purchased through DRMIS like most other commodities. This results in a manual recording of the purchase information and physical acceptance of inventory in the system of record, which has been susceptible to error. The Department has been making efforts to review and modernize its materiel pricing processes and data as part of its action plan in response to prior concerns raised by the Office of the Auditor General. Through this initiative, ADM(Mat) has developed an initial standard process that clarifies the responsibilities and procedures for the receipt of materiel not purchased through DRMIS, including A&E. This process was documented in departmental policy in June 2017 and communicated to stakeholders in July 2017. The policy update ensures consistency among the purchasing organizations on a going-forward basis and adds a compensating control to minimize errors in the recording of purchase information in the short term. However, a long-term solution will be required to eliminate the need for this manual process, as part of improvements to the systems' functionality referred to in Section 2.3 – Information Management.

The management of the issues, returns and consumption of A&E and adjustment transactions is generally appropriate, having clear processes and complete documentation, with some minor exceptions. While the audit team has briefed management on the results of the audit, a recommendation for these processes was not deemed necessary because of the minor nature of the observations.

### **3.0 General Conclusion**

The management of A&E within DND/CAF requires improvement to facilitate and support the achievement of AP objectives in the areas of governance, planning, disposal, information management and safety management.

There are some gaps and potential overlaps in the current governance structure due to the lack of an overarching document that defines and distinguishes the roles, responsibilities and authorities of the numerous organizations with a role in the AP. The governance framework also requires a performance management framework to ensure accountability and drive ongoing improvement to the AP.

The Department's efforts to plan its A&E purchasing strategy are fragmented, and its efforts to dispose of A&E inventory are not timely, neither of which optimizes A&E inventory holdings. Coordination is required at the departmental level to reduce the risk of inventory levels being below or above requirements, and to avoid additional costs and the need to employ suboptimal methods of disposal for A&E that becomes unstable over time.

The use of two information systems to manage A&E and the lack of system integration or automatic reconciliation does not support informed decision making. The reconciliation of the data held in the two systems, as well as an information technology solution are required to address the systems' functionality and control limitations and improve the accuracy and completeness of A&E information.

The inspection processes are appropriate to assess compliance with safety requirements. However, policy updates and improvements to the reporting tools are required to resolve outstanding issues on a timely basis while accurately depicting the safety conditions at A&E storage facilities.

Lastly, inventory control processes are well managed with some minor exceptions. A recent policy update is sufficient as an interim measure to minimize errors in the manual receipting process for the delivery and acceptance of inventory at ammunition depots.

## **Annex A—Management Action Plan**

ADM(RS) uses recommendation significance criteria as follows:

**Very High**—Controls are not in place. Important issues have been identified and will have a significant negative impact on operations.

**High**—Controls are inadequate. Important issues are identified that could negatively impact the achievement of program/operational objectives.

**Moderate**—Controls are in place but are not being sufficiently complied with. Issues are identified that could negatively impact the efficiency and effectiveness of operations.

**Low**—Controls are in place but the level of compliance varies.

**Very Low**—Controls are in place with no level of variance.

### **Governance**

#### **ADM(RS) Recommendation (High Significance)**

1. It is recommended that SJS, with input from relevant stakeholders, distinguish, define and communicate the roles, responsibilities and authorities of all organizations involved with the AP.

This is to include the following:

- Define the roles, responsibilities and authorities of SJS as related to the AP.
- Document the roles of all organizations involved with the AP and how they support each other in a central source document.

### **Management Action**

Develop and clearly define the Functional Authorities (FA) for the Ammunition Program (AP). Step 1 – DAOD 1000-4 requires revision and amendment to reflect SJS' FAs. Step 2 – As FA for specified elements, SJS to promulgate directives to the A&E community to reflect organizational/L1 roles and responsibilities (DAOD 10000-series).

Milestone 1:

Strategic J4 Ammunition, in partnership with the ammunition program stakeholders and related FAs, will draft proposed amendments to DAOD 1000-4 to reflect SJS FA for appropriate elements to ensure that it reflects the current program and structure. The revised DAOD will be reviewed by and discussed with stakeholders; the Ammunition Program Steering Committee (APSC)/Ammunition Program Oversight Committee (APOC) will be used to promulgate the draft FAs.

**OPI:** SJS

**Target Date:** June 2018

Milestone 2:

Secure endorsement for amended DAOD 1000-4. Refresh and/or review periodically to reflect any changes in Force Posture and Readiness (FP&R), *Strong, Secure, Engaged: Canada's Defence Policy* (SSE) or the AP.

**OPI:** SJS

**Target Date:** December 2018

Milestone 3:

Develop and promulgate a DAOD 10000-series DAOD to reflect departmental/L1 roles and responsibilities by FA.

**OPI:** SJS

**Target Date:** April 2019

#### **ADM(RS) Recommendation (High Significance)**

2. It is recommended that SJS complete the development and implementation of a performance management framework for the AP.

#### **Management Action**

A performance management framework will be developed using Treasury Board of Canada Secretariat methodology from the Program Management and Evaluation Process and following SCOR (M) (Supply Chain Operations Reference (Model)) evaluation processes to allow the AP to measure whether objectives are met, ensure accountability and drive ongoing improvements to the program. As per AP Governance, the roles, responsibilities and functional authorities of SJS with respect to the AP and those of the APOC will be reflected in both VCDS approved Terms of Reference (for the APOC) and DAOD 1000-4. Departmental/L1 responsibilities for performance metrics, and AP Strategic Policy and Doctrine shall be reflected in a DAOD 10000-series.

Milestone 1:

A performance management framework will be defined in a DAOD specific 10000-series document addressing SJS and departmental/L1 roles and responsibilities for the AP. Within the framework, metrics, baselines and methodology will be developed.

**OPI:** SJS

**Target Date:** June 2018



Milestone 2:

Strategic J4 Ammunition to work with DAER to reflect the roles and mandate of the AP within the AESM Volume 1, then obtain endorsement and approval for tombstone reference alterations. First reports from the framework are planned to be presented at APSC/APOC Fall 2018. Refresh and/or review periodically to reflect any changes in FP&R, SSE or the AP.

**OPI:** SJS

**Target Date:** December 2018

## **Optimizing Inventory Holdings**

### **ADM(RS) Recommendation (High Significance)**

3. It is recommended that SJS establish substantiated A&E inventory requirements by coordinating and formalizing the planning efforts within DND/CAF.

### **Management Action**

Develop the framework and process for the optimization of DND/CAF A&E inventory. Current state is that a draft Inventory Requirements policy has been reviewed by and discussed with L1 organizations, but no concrete feedback has been received through the Ammunition Effects Planning Working Group (AEPWG). The first iteration of DND/CAF Optimization of A&E inventory will be developed through the AEPWG and the Ammunition Stockpile Planning Working Group (ASPWG).

Milestone 1:

The initial Inventory Requirements numbers are planned to be determined by AEPWG. This will be the initial draft of the nascent collective.

**OPI:** SJS

**Target Date:** May 2018

Milestone 2:

The Lower and Upper Control Limits will be established by the ASPWG to ensure adherence with FP&R, SSE, affordability, sustainability and logistics feasibility.

**OPI:** SJS

**Target Date:** November 2018

Milestone 3:

Established Lower and Upper Control Limits will be implemented by ADM(Mat) for life-cycle management, to include system of record updates.

**OPI:** SJS

**Target Date:** April 2019

#### **ADM(RS) Recommendation (High Significance)**

4. It is recommended that ADM(Mat) develop and implement a plan to acquire the capabilities for the disposal of surplus, obsolete and end-of-lifecycle A&E inventory in an effective and timely manner.

#### **Management Action**

ADM(Mat), along with the functional authorities listed as offices of collateral interest (OCI), will identify DND/CAF's holistic A&E disposal requirements, map out projects for capability acquisition and deliver A&E disposal solutions.

Milestone 1:

ADM(Mat) will develop a Plan to acquire capabilities for the disposal of small arms ammunition, spent brass, aids-to-production, and munitions scrap.

**OPI:** ADM(Mat)/Director General Land Equipment Program Management (DGLEPM)

**OCI:** ADM(IE), CJOC, SJS, DAER

**Target Date:** February 2018

Milestone 2:

By implementing four minor capital equipment projects, ADM(Mat) will acquire and install disposal equipment for small arms ammunition, spent brass, aids-to-production, and munitions scrap at Canadian Forces Ammunition Depot Dundurn.

**OPI:** ADM(Mat)/DGLEPM

**OCI:** ADM(IE), CJOC, SJS, DAER

**Milestone 2a Target Date:** March 2019 – Disposal equipment for aids-to-production acquired and installed.

**Milestone 2b Target Date:** December 2019 – Disposal equipment for spent brass and munitions scrap acquired and installed.

**Milestone 2c Target Date:** March 2020 – Disposal equipment for small arms ammunition acquired and installed.

Milestone 3:

ADM(Mat) will deliver to CJOC operational disposal equipment, spares and training as required to ensure the commencement of disposal activities.

**OPI:** ADM(Mat)/DGLEPM

**OCI:** ADM(IE), CJOC, SJS, DAER

**Milestone 3a Target Date:** May 2019 – Disposal equipment for aids-to-production fully operational.

**Milestone 3b Target Date:** February 2020 – Disposal equipment for spent brass and munitions scrap fully operational.

**Milestone 3c Target Date:** May 2020 – Disposal equipment for small arms ammunition fully operational.

Milestone 4:

The identification phase of a major capital investment project, that delivers DND/CAF's holistic A&E disposal capability solution, will be completed by December 2019.

**OPI:** ADM(Mat)/DGLEPM

**OCI:** ADM(IE), CJOC, SJS, DAER

**Target Date:** December 2019

## Information Management

### ADM(RS) Recommendation (High Significance)

5. It is recommended that, in the short term, SJS, in coordination with all stakeholders that store A&E inventory, implement an initiative to identify and resolve the discrepancies between AIMS and DRMIS by reviewing and comparing all A&E inventory records in both systems and performing the necessary adjustment transactions on a regular basis.

### Management Action

Each second and third line facility that stores A&E will do a 100 percent verification in accordance with their respective Stocktaking Plan, and reconcile differences between AIMS and DRMIS. Currently, discrepancies remain between Storage Locations (SLOCs) and stock-on-hand. A stakeholder tiger-team will examine the potential for a SAP application to not only address warehousing (stock control), but also the unique requirements associated with ammunition holdings.

Milestone 1:

Each second and third line Ammunition Depot will do a 100 percent inventory and stock verification. Inventory reconciliation will be executed between AIMS, DRMIS, SLOC and stock-on-hand. Stock verification and reconciliation will be in accordance with established annual stocktaking plans and/or ad hoc as required. This is referenced in Supply Administration Manual Chapter 7.2 para 2.29.

**OPI:** SJS

**Target Date:** December 2018

Milestone 2:

The rollout of the planned Enhanced Warehouse Management (EWM) Ammunition Module, developed by SAP, should negate the requirement for further use of AIMS. As such, once EWM Ammo Module goes live, AIMS will be phased out, only one system will be utilized. The period between the rollout of EWM, currently planned for March 2020, and the attainment of Milestone 2, July 2020, is to focus on inventory control, data integrity/accuracy etc. In essence, the time will be used to consider/verify if anything has gone astray, develop a mitigation plan (if required)

and conduct a validation. Corrective actions are required from time-to-time as data may not transfer as anticipated, formatting is lost, links no longer function etc.

**OPI:** SJS

**Target Date:** July 2020

#### **ADM(RS) Recommendation (High Significance)**

6. It is recommended that ADM(IM), in coordination with SJS and ADM(Mat), develop and implement an information technology solution with adequate controls that would ensure the completeness and accuracy of A&E information, while addressing the current systems' functionality limitations, user requirements and automated reconciliation of A&E inventory records.

#### **Management Action**

ADM(IM) agrees with this recommendation. The following actions will be undertaken:

1. DRMIS will acquire and implement the EWM module, with the needed A&E safety requirements, no later than the end of FY 2018/19, which will provide the functional capability to permit the replacement of AIMS. The target date will be the fourth quarter of FY 2018/19.

**OPI:** ADM(IM)/Director DRMIS

**Target Date:** March 2019

2. DRMIS will support SJS and ADM(Mat) in the resolution of data discrepancies between AIMS and DRMIS. Data discrepancies must be resolved by the fourth quarter of FY 2019/20 to support the implementation of A&E management within DRMIS. The target date will be the fourth quarter of FY 2019/20.

**OPI:** ADM(IM)/Director DRMIS, in support of SJS and ADM(Mat)

**Target Date:** March 2020

3. Integration of the needed A&E capability into DRMIS will involve the following three key phases:

Phase 1 – Planning and Scoping – ADM(IM)/DRMIS is leading a Planning and Scoping Phase with SJS and ADM(Mat) to fully understand the A&E functional and technical requirements. The resulting work plan and costing for the implementation project will be available in the first quarter of FY 2018/19.

Phase 2 – Blueprinting – Based on the Planning and Scoping Phase, this phase will address the design of the needed functionality within DRMIS. This will be done in conjunction with SJS and ADM(Mat). The target date will be the third quarter of FY 2018/19.

Phase 3 – Build and Implement – The A&E design will be configured within DRMIS and migrated into production, which will include user training, data migration and user acceptance. The target date will be the fourth quarter of FY 2019/20.

**OPI:** ADM(IM)/Director DRMIS, with support from SJS and ADM(Mat)

**Target Date:** Phase 1 – June 2018; Phase 2 – December 2018; and Phase 3 – March 2020

## Safety

### ADM(RS) Recommendation (Moderate Significance)

7. It is recommended that DAER update and communicate guidance to track, assess and report on outstanding corrective action plans such that deficiencies are resolved on a timely basis and the overall status of the AESI/AESS accurately reflects the safety conditions at A&E facilities.

### Management Action

DAER concurs with the findings. To effect change, in addition to amending the AESI criteria, DAER will leverage the Ammunition and Explosives Safety Information Management System. There are no costs directly associated with the implementation of this management action plan.

An AESI criterion, established to assess the safety conditions at A&E facilities, has been amended and will be reflected throughout the execution of the DAER compliance assurance program starting in FY 2017/18. The functionality to corporately record and track compliance assurance observations and associated Level 1 organization's corrective action plans is being incorporated into the Ammunition and Explosives Safety Information Management System. The management action plan will be executed such that, by the end of FY 2019/20, Ammunition and Explosives Safety Information Management System and Level 1 organization users will be at steady state with at least one year of corrective action plans observed and tracked for completion.

This management action plan will be closed on April 1, 2020, once the FY 2019/20 reporting cycle is complete.

**OPI:** DAER

**Target Date:** April 2020

## Annex B—Audit Criteria

### Criteria Assessment

The audit criteria were assessed using the following levels:

#### Assessment Level and Description

**Level 1**—Satisfactory

**Level 2**—Needs Minor Improvement

**Level 3**—Needs Moderate Improvement

**Level 4**—Needs Significant Improvement

**Level 5**—Unsatisfactory

### Governance

1. Governance processes integrate and align with priorities and accountabilities to ensure that internal management functions support and enable high-performing policies, programs and services.

**Assessment Level 4** – While APOC is in place to provide oversight, significant improvement is required in this area to ensure that the accountabilities for key stakeholders are clearly defined and documented, and that a performance management framework is in place to measure the extent to which the AP meets its objectives.

### Inventory Control and Safety

2. Inventory control processes are in place to ensure proper accounting for A&E and to monitor the compliance with security and safety requirements.

**Inventory Control: Assessment Level 1** –Inventory control processes and guidance are in place and sufficient to properly account for A&E inventory.

**Safety: Assessment Level 3** – Although processes are in place and sufficient to monitor compliance with safety requirements, improvements to the reporting process are required to accurately portray the state of safety conditions at A&E facilities.

### Inventory Management

3. Inventory management for A&E is performed in a sustainable and financially responsible manner that supports the cost-effective and efficient delivery of departmental programs.

**Assessment Level 4** – Significant improvement is required in this area to ensure inventory management practices related to procurement planning and disposal of A&E inventory are effective and optimize inventory holdings.

### Information Management

4. Materiel information systems are in place to enable the collection and generation of complete and accurate data, and to support timely and informed decisions.

**Assessment Level 4** – Significant improvement is required in this area to ensure that both materiel information systems contain complete and accurate data and support timely and informed decision making through the development of an information technology solution, along with an initiative to resolve discrepancies in the interim.

#### **Source of Criteria**

Treasury Board Secretariat. Audit Criteria Related to the Management Accountability Framework: A Tool for Internal Auditors, March 2011.

Treasury Board Secretariat. Policy on Management of Materiel, November 2006.