National Defence | Défense nationale

DIRECTOR AMMUNITION AND EXPLOSIVES REGULATION

Annual Report

Ninth Report to the Deputy Minister and the Chief of the Defence Staff

A Review from 1 April 2016 to 31 March 2017

Canada

Cover Photo

A pilot inspects his CF-18 Hornet fighter jet in preparation for the next mission at Camp Patrice Vincent, Kuwait during Operation IMPACT on January 17, 2015.

Leading Seaman Jennifer Buckle, a member of the boarding party from Her Majesty's Canadian Ship WINNIPEG fires a 9mm pistol on the flight deck of the ship as part of an exercise during POSEIDON CUTLASS, March 15, 2017.

Canadian Armed Forces members with NATO's enhanced Forward Presence Battlegroup Latvia defend their position during a simulated early morning battle on August 23, 2017, as a part of the Certification Exercise being held at Camp Adazi, Latvia during Operation REASSURANCE.

Corporal Brendan McDevitt (left) and Master-Corporal Steven Drinkwalter prepare to load a CH124 Sea King helicopter with two MK46 torpedoes during hot torpedo load training on the flight deck of Her Majesty's Canadian Ship REGINA on May 22, 2014 in support of NATO Reassurance Measures in the Mediterranean Sea.

Director Ammunition and Explosives Regulation
National Defence Headquarters
Major-General George R. Pearkes Building
101 Colonel By Drive
Ottawa, Ontario K1A OK2

Telephone: 819-939-8424
Facsimile: 819-997-8574

Defence Information Network Email: ADMMATDAER-DREMADMMatDAEROttawa-Hull@forces.gc.ca
Defence Information Network Page: http://materiel.mil.ca/en/about-us-organizational-structure/daer.page

NDID: A-JS-040-000/JP-001

Print – English
Government of Canada Catalogue Number: D3-27E
ISSN: 1929-4719

Print – French
Government of Canada Catalogue Number: D3-27F
ISSN: 2561-3480

Electronic English
Government of Canada Catalogue Number: D3-27E
ISSN: 1929-4727

Electronic French
Government of Canada Catalogue Number: D3-27F
ISSN: 1929-4735

Ninth Report to the Deputy Minister and the Chief of the Defence Staff

A Review from 1 April 2016 to 31 March 2017

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Director Ammunition and Explosives Regulation's annual report to the Deputy Minister and Chief of the Defence Staff provides an independent assessment of the state of ammunition and explosives safety within the Department of National Defence and Canadian Armed Forces. This is accomplished through careful consideration of organizational practices around the Ammunition and Explosives Safety Program, the management of ammunition and explosives risk, and organizational compliance with regulatory safety requirements.

As a corporate means to manage ammunition, explosives and associated support capabilities, the Ammunition Program utilizes a nine-element framework. The Director Ammunition and Explosives Regulation has adopted this corporate framework to progress its line of effort in order to assess ammunition and explosives through a safety lens. This perspective is in line with the organization's functional authority for ammunition and explosives regulation and safety and does not consider areas for which it is not the functional authority (materiel acquisition, materiel and inventory management, stock levels/requirements definition, distribution, etc.).

With this in mind, only Elements 1, 2, 4 and 7 are addressed within this first edition of a revised annual report, as only these elements have been subject to safety compliance activities for the reporting period. The remaining elements may form part of subsequent annual reports as their link to ammunition and explosives safety is assessed, appropriate inspection criteria are developed and an inspection cycle incorporated into the risk-informed safety compliance model. Where observations against infrastructure were previously reported under Ammunition Program Element 4 – Ammunition and Explosives Operations Support and Readiness, they will now be reported under Element 7 – Ammunition and Explosives Infrastructure.

RESULTS

Overall, the 2016/2017 results represent a positive trend across the Department of National Defence and the Canadian Armed Forces for the elements that have been subject to compliance assurance activities. Sustained organizational efforts towards achieving ammunition and explosives safety and minimizing personnel injury or death, or material loss have demonstrated departmental due diligence while contributing to the Department of National Defence's and the Canadian Armed Forces' operational effectiveness. A direct contributor to the department's success is the continued engagement of the level one ammunition technical authorities within their organizations. Recognized as subject matter advisors for all ammunition and explosives related matters, the level one ammunition technical authorities continue to play a pivotal role in supporting departmental safety and regulatory requirements.

While acknowledging the overall progress made during the reporting year, some areas continue to present opportunities for improvement. The following paragraphs provide an executive summary, by Ammunition Program element, of the key observations made throughout the reporting period.

KEY OBSERVATIONS – POLICY

Three major policy instruments were published:

- Defence Administrative Order and Directive 1000-8 – Policy Framework for Safety and Security Management, assigned functional authority for ammunition and explosives regulation and safety to the Director Ammunition and Explosives Regulation;
- Defence Administrative Order and Directive 3002-0 – Ammunition and Explosives clarified ammunition and explosives level one organizational authorities; and
- Defence Administrative Order and Directive 3002-7 – Ammunition and Explosives Risk Management detailed the Departmental and Canadian Armed Forces ammunition and explosives risk management responsibilities and risk management framework.

Over the reporting period, the Director Ammunition and Explosives Regulation implemented its three-year policy review cycle, while efforts continued to investigate the requirement to transfer roles and responsibilities over specific ammunition and explosives policy documents between the Director Ammunition and Explosives Regulation, the Assistant Deputy Minister (Materiel) and Strategic Joint Staff.[1]

[1] Following the realignment of J4 Ammunition from the Assistant Deputy Minister (Materiel) to the Strategic Joint Staff.

KEY OBSERVATIONS – COMPLIANCE

Element 1 – Ammunition and Explosives Regulation.

- Director Ammunition and Explosives Regulation. In February of 2005, the Department of National Defence and the Canadian Armed Forces' ammunition safety program was subject to an evaluation by Assistant Deputy Minister (Review Services) (then Chief Review Services), resulting in the establishment of the Director Ammunition and Explosives Regulation in 2006. As part of the review model for the organization, the Assistant Deputy Minister (Materiel) requested a second evaluation by the Assistant Deputy Minister (Review Services) during the reporting period. Findings of the evaluation should be made available in August of 2017 and will be presented as part of the annual report for fiscal year 2017/2018.

Element 2 – Ammunition and Explosives Equipment Program Management.

- Demilitarization and disposal. This year saw a positive trend in disposal resulting in the overall decrease of holdings by approximately two magazines of ammunition and explosives (approximately 800 pallets). This trend was predominantly the result of disposal by sale of salvage through the Assistant Deputy Minister (Materiel). There was, however, a slight gain in the quantity of ammunition and explosives awaiting disposal by demilitarization/destruction. The total storage volume required to store the current ammunition and explosives inventory earmarked for disposal is estimated to be 22 magazines, a decrease of two magazines when compared to fiscal year 2015/2016. The absence of an institutional demilitarization/destruction facility/strategy is a recurring observation and continues to represent a capability deficiency which harbours a potential safety concern associated with the requirement to store time-expired, deteriorated, obsolete, and/or surplus ammunition and explosives; and

- Periodic Inspections. A review of the ammunition and explosives inventory using the Ammunition Information & Maintenance System highlighted over 3000 lots overdue for a periodic inspection. The results were communicated to the Assistant Deputy Minister (Materiel) who, as the functional authority for materiel and inventory management, has taken measures within the three equipment program management organizations, and in collaboration with the operational community, to resolve the issue in a timely manner.

Element 4 – Ammunition and Explosives Operations Support and Readiness.

- Ammunition and Explosives Safety Inspection. The overall execution and reporting of the ammunition and explosives safety inspection is mature and well understood at the strategic and operational levels. The aggregated results for first, second, and third line ammunition and explosives storage facilities/operations are considered a major accomplishment during the reporting period with improvements observed in three aggregated scores from the previous reporting year. The ammunition and explosives safety inspection scoring values will be scrutinized to determine baseline standards and if thresholds should be adjusted upwards;

- A&E Licences – Data Integrity. A compliance audit of level one ammunition and explosives storage licences highlighted that no unit, of the 24 second line facilities and four Canadian Forces Ammunition Depots, was found to be 100% accurate in matching their ammunition and explosives storage licences to the information found in the Ammunition Information & Maintenance System. Findings were promptly communicated to the affected level one organizations with corrective measures implemented by most within the reporting period. The Royal Canadian Air Force and the Director Ammunition Explosives Regulation continued to collaborate with the intent of bringing about corrective measures during the next reporting year; and

- A&E Licences – Expired. It was observed that a number of facilities were operating with expired explosives storage licences. Operating with inaccurate or expired explosives storage licences is a safety concern that increases the potential for a catastrophic event. Once advised, affected level one organizations promptly initiated corrective measures.

Element 7 – Ammunition and Explosives Infrastructure.

- Infrastructure Condition and Requirements. The Assistant Deputy Minister (Infrastructure and Environment) is currently in its second year of a three-year facility condition assessment[2] . To date, approximately 1500 assets of the total 3200 have been assessed, a portion of which are related to ammunition and explosives. In parallel to this study, the Strategic Joint Staff is conducting a comprehensive, first-principles analysis of the Ammunition Program infrastructure at the strategic, operational and tactical levels. Despite ongoing initiatives to characterize the departmental infrastructure portfolio, ageing and deteriorating ammunition and explosives infrastructure continues to represent a potential safety concern with growing uncertainty around the ability of some magazines and workshops to perform as originally intended and protect holdings and/or personnel should a catastrophic event occur at an adjacent magazine.

KEY OBSERVATIONS – ADVOCACY

With the implementation of the distributed learning packages for the Unit Ammunition Representative and the Unit Explosives Safety Officer courses, the department has strengthened its ammunition and explosives safety programs through the delivery of trained, qualified and authorized personnel. The rollout of release one[3] of the Ammunition and Explosives Safety Information Management System will greatly facilitate accurate reporting, enable real-time accident and incident trend analysis and enhance the passage of safety information. Further improvement in the reporting culture within the ammunition and explosives community remains a priority for the Director Ammunition and Explosives Regulation.

CONCLUSION

While there remains opportunity for improvement, progress has been made in several areas. Departmental oversight of ammunition and explosives safety will continue to increase as the compliance assurance model is applied, in consultation with level one organizations, to each of the Ammunition Program elements, where applicable. The application of new software tools will also undoubtedly enhance the department's ability to identify and track such issues as licensing and periodic inspections.

[2] For facilities valued at $1M and above

[3] Release 1 enables the reporting of ammunition and explosives accidents, incidents, defects and malfunctions.

PICTURE ON THE RIGHT: *Two CF-188 Hornet fighters return from patrolling Iceland's airspace during Operation REASSURANCE in Keflavik, Iceland, May 19, 2017.*

PROLOGUE

It is a distinct pleasure to present the Director Ammunition and Explosives Regulation's ninth annual report to the Deputy Minister and Chief of the Defence Staff. This report provides a "health check" on the state of ammunition and explosives safety and risk management for the Department of National Defence and the Canadian Armed Forces.

Ammunition and explosives under the direction or control of the Minister of National Defence are exempt from the provisions of the *Explosives Act* and associated Regulations. Notwithstanding, the Department of National Defence and the Canadian Armed Forces have an obligation to oversee the spectrum of their ammunition and explosives related activities to ensure safety through the effective control, management and use of this strategic commodity during its life cycle.

As the Department of National Defence's and the Canadian Armed Forces' functional authority for ammunition and explosives safety, the Director Ammunition and Explosives Regulation has adopted the following regulatory oversight strategy, which sets the tone for the report:

- Safety through the provision of regulatory safety policies, orders and directives;
- Safety through the execution of departmental compliance assurance activities; and
- Safety through the oversight and management of the Ammunition and Explosives Safety Program.

AMMUNITION PROGRAM-BASED COMPLIANCE MODEL

As a corporate means to manage ammunition and explosives and associated support capabilities, the Ammunition Program utilizes a nine-element framework (depicted at Table 1). The creation of the Ammunition Program represents an opportunity for the Director Ammunition and Explosives Regulation. The organization has adopted this corporate framework to progress its line of effort to assess ammunition and explosives through a safety lens. This perspective is in line with the organization's functional authority for ammunition and explosives regulation and safety and does not consider areas for which it is not the functional authority (materiel acquisition, materiel and inventory management, stock levels/ requirements definition, distribution, etc.).

The Director Ammunition and Explosives Regulation has therefore adopted an Ammunition Program-based, risk-informed compliance model that will assess safety throughout the program[4]. By applying the proven concept of operations for assessing safety risks at ammunition and explosives storage facilities[5] to all applicable elements of the Ammunition Program, the annual report will address all areas concerned with ammunition and explosives safety within the Department of National Defence and Canadian Armed Forces.

TABLE 1 – AMMUNITION PROGRAM

Ammunition Program Elements	Definition
1 – Ammunition and Explosives Regulation	Policies, orders and directives governing the safe acquisition, storage, transportation, inspection, maintenance, authorized modification, issue, use and disposal of all ammunition and explosives under the direction or control of the Minister of National Defence.
2 – Ammunition and Explosives Equipment Program Management	Life cycle materiel management of ammunition and explosives under the direction or control of the Minister of National Defence.
3 – Ammunition Program Planning and Management	Risk management and performance measurement framework to ensure: • Accountability – the provision of accurate inventory and financial data; and • Capability – the delivery of an ammunition support capability to meet Force Posture and Readiness training and operational mission requirements.
4 – Ammunition and Explosives Operations Support and Readiness	Provision of an ammunition support capability to meet Force Posture and Readiness training and operational mission requirements.
5 – Ammunition Program Strategic Policy and Doctrine	Strategic operational policy and doctrine to meet Force Posture and Readiness requirements for training and/or ammunition and explosives operational mission support capabilities.
6 – Ammunition and Explosives Practitioners	Civilian and military ammunition human resource capability.
7 – Ammunition and Explosives Infrastructure	Infrastructure and real property and immovables to support Force Posture and Readiness operational mission and/or training requirements.
8 – Ammunition and Explosives Systems	Systems required to coordinate and control materiel management, Force Posture and Readiness training requirements, and operational mission planning processes.
9 – Ammunition and Explosives Inventory	Ammunition and explosives inventory based on an effects planning model that supports Force Posture and Readiness requirements.

[4] Compliance activities have historically been focused on first, second, and third line ammunition and explosives storage facilities; these are now captured under element four of the Ammunition Program – Ammunition and Explosives Operations Support and Readiness.

[5] Implemented in 2010, the ammunition and explosives safety inspection is a mature process that has accurately measured ammunition and explosives safety for first, second, and third line storage facilities and operations.

Recognizing that personnel interaction with ammunition and explosives primarily occurs at first, second and third line storage facilities, the community will continue to conduct compliance activities over 100% of ammunition and explosives activities under Element 4 – Ammunition and Explosives Operations Support and Readiness. In contrast, the cycle of compliance activities over the remaining elements of the Ammunition Program will be commensurate with the assessed ammunition and explosives safety risk for each element. This risk management approach will ensure resources continue to be directed to the highest priorities.

In line with this concept of operations, the Director Ammunition and Explosives Regulation and the Assistant Deputy Minister (Materiel) invested significant effort over the reporting period developing a comprehensive Ammunition Program-based, risk-informed compliance model for Element 2 – Ammunition and Explosives Equipment Program Management. This initiative will continue to evolve over the coming years, incorporating additional elements and affected level one organizations where deemed appropriate, with results incorporated into the annual report.

COMPLIANCE MODEL

Ammunition and explosives compliance assurance against the elements of the Ammunition Program is executed primarily through the following two activities:

- Audits: a comprehensive assessment of organizational operations, activities, and practices verifying compliance with ammunition and explosives safety orders and directives through the establishment of processes and procedures; and
- Evaluations: a review of organizational activities and practices to determine whether they meet the desired regulatory outcome – focusing on process outputs and examining questions pertaining to relevance, effectiveness and efficiency as they relate to safety.

Compliance audits and evaluations inform decision-making, improvements, innovations and accountabilities. Compliance evaluations determine whether the systems and processes, as identified through compliance audits, meet the desired safety objectives and identify the need for any change to comply with the safety regulations. Both are concerned with ensuring that the Department of National Defence's and the Canadian Armed Forces' systems and processes are in line with ammunition and explosives safety regulations.

AMMUNITION AND EXPLOSIVES SAFETY PROGRAM

While the Director Ammunition and Explosives Regulation's initial thrust of activities was to establish a functioning ammunition and explosives regulating body and a corporate level ammunition and explosives safety program, there will be a concerted effort in the years to come to broaden and deepen the knowledge of the safety program within the Department of National Defence and Canadian Armed Forces. Through the development and implementation of a communications strategy together with an in-house capability to conduct meaningful statistical analysis of safety information gleaned from the Ammunition and Explosives Safety Information Management System, the Director Ammunition and Explosives Regulation intends to elevate the importance of ammunition and explosives safety within the department and contribute towards a stronger overall safety culture.

A foundational tenet of the report is that transparency, dialogue and collaboration will strengthen the regulatory framework. Accordingly, the enclosed report has been coordinated and discussed with all level one organizations, at the technical staff and senior leadership levels, during the reporting year and prior to finalization.

PICTURE ON THE RIGHT: *Members of 2nd Battalion Royal Canadian Horse Artillery ready the live rounds during Exercise DOUBLE DRAGON held in Alberta's Wainwright garrison, in preparation of Exercise MAPLE RESOLVE on May 12, 2017*

POLICY

INTRODUCTION

This section of the annual report has been redesigned to discuss major amendments and findings as they relate to ammunition and explosives (A&E) safety policies. Supporting documents and general policy information previously found within the annual report can now be found on the Director Ammunition and Explosives Regulation (DAER) intranet site http://materiel.mil.ca/en/joint-common-ammo-explosives/controlled-documents.page.

Except as provided by the *Explosives Regulations, 2013*, the Explosives Act does not apply to or in respect of any explosives under the direction or control of the Minister of National Defence (MND). Within the Department of National Defence (DND), DAER is the functional authority for A&E regulation and safety. DAER fulfils its mandate in part through the development and promulgation of A&E safety policies, orders, directives and other instruments related to the safe acquisition, storage, transportation, inspection, maintenance, authorized modification, issue, use and disposal of A&E under the direction or control of the MND, including A&E used for research and development.

While functional authorities for areas that affect A&E are distributed across several level one organizations, DAER is responsible, through stakeholder engagement, for ensuring A&E safety policies are accurate and current. Consequently, DAER has included, within its policy framework, a three-year review cycle as shown in Table 2.

KEY POLICY CHANGES

As part of Defence Renewal Initiative 8.3 – Policy and Procedure Continuous Improvement, the Defence Administrative Orders and Directives (DAOD) policy functional areas and frameworks were reviewed and DAOD 1000-8 – Policy Framework for Safety and Security Management assigned DAER as the functional authority for A&E regulation and safety.

DAOD 3002-0 – Ammunition and Explosives has been promulgated by the Deputy Minster (DM) and Chief of the Defence Staff (CDS). It assigns authority to commanders to approve and accept risk in situations where A&E safety orders and directives cannot be followed and where there is an operational imperative to conduct an A&E activity (Table 3). This enables commanders at appropriate levels to make risk-informed decisions in support of operations while acknowledging, accepting and mitigating identified A&E safety risks.

TABLE 2 – A&E SAFETY POLICY PUBLICATION REVIEW CYCLE

Document	Title	FY 17/18	FY 18/19	FY 19/20
DAOD 3002-0	Ammunition and Explosives		X	
DAOD 3002-1	Certification of Ammunition and Explosives	X		
DAOD 3002-2	Insensitive Munitions			X
DAOD 3002-3	Ammunition and Explosives Safety Program		X	
DAOD 3002-4	Ammunition and Explosives Accident, Incident, Defect or Malfunction Reporting		X	
DAOD 3002-5	Use of Firearms, Ammunition and Explosives	X		
DAOD 3002-7	Ammunition and Explosives Risk Management	X		
C-09-005-001/TS-000	Program Management and Life Cycle Safety			X
C-09-005-002/TS-001	Storage and Facility Operations	X		
C-09-005-003/TS-000	Transportation			X
C-09-005-004/TS-000	Demilitarization and Disposal	X		
C-09-005-005/TS-000	Deployed Operations	X		
C-09-005-006/TS-001	Naval Vessels		X	
C-09-005-007/TS-001	Certification of Ammunition, Explosives and Accessories for Service Use			X
C-09-005-008/TS-001	Design and Construction Standards		X	
C-09-005-009/TS-001	Hazards of Electromagnetic Radiation to Ordnance (HERO)	X		
A-GG-040-006/AG-001	Explosives Safety Program			X
A-GG-040-006/AG-002	Ammunition or Explosives Accident/Incident/Defect/Malfunction Reporting			X

TABLE 3 – A&E SAFETY RISK APPROVAL AND ACCEPTANCE MATRIX

Current Risk	Technical Review Authority	Technical Review Authority
Very High	DAER	CDS/DM
High	DAER	CDS/DM or L1
Significant	L1 A&E Specialist	L1
Medium	L1 A&E Specialist	L1 or subordinate commanders
Low[6]	Subordinate commander's A&E specialist	Subordinate commanders

DAOD 3002-7 – Ammunition and Explosives Risk Management was also published in conjunction with DAOD 3002-0 and details the DND and the Canadian Armed Forces (CAF) A&E risk management framework. The ammunition and explosives risk assessment safety case (AERASC) process for assessing risk can be found in the Ammunition and Explosives Safety Manual, Volume 1 – Program Management and Life Cycle Safety.

Ammunition & Explosives Instruction (A&EI) 56 was released during the reporting period. It details the regulatory requirement for trained unit ammunition representatives (UAR) and unit explosives safety officers (UESO). Effective 1 April 2017, units will require qualified UARs and UESOs in order to receive A&E or operate a licensed unit A&E lock-up.

Publication of Volume 6 – Naval Vessels, and Volume 8 – Design and Construction Standards, of the Ammunition and Explosives Safety Manual that were to be released during the fiscal year (FY) 2016/2017 reporting period were delayed due to resource constraints within the responsible organizations. Release of the policy documents has been pushed to FY 2018/2019, in line with the recently established policy review cycle.

Volume 9 – Hazards of Electromagnetic Radiation to Ordnance has been made available in French with the English version expected to be published in FY 2017/2018.

[6] Accepted level of risk within established minimum safety standards.

INTERNATIONAL ENGAGEMENT

Active participation in the North Atlantic Treaty Organisation (NATO) Conference of National Armaments Directors Ammunition Safety Group – AC/326 remained a priority. These activities contribute to the development of NATO A&E policies, the alignment departmental policies and procedures with those of our Allies and directly support A&E safety during deployed operations.

As a cost saving measure, NATO ceased providing administrative support to the AC/326 Main Group and its three sub-groups. Concerns around the sub-groups' ability to execute the Main Group's Management Plan for FY 2017/2018 were raised by member nations. Consequently, the Main Group's management plan was not endorsed pending further discussions between the National Armaments Directors. The group will be monitoring its ability to deliver on its mandate over the coming years.

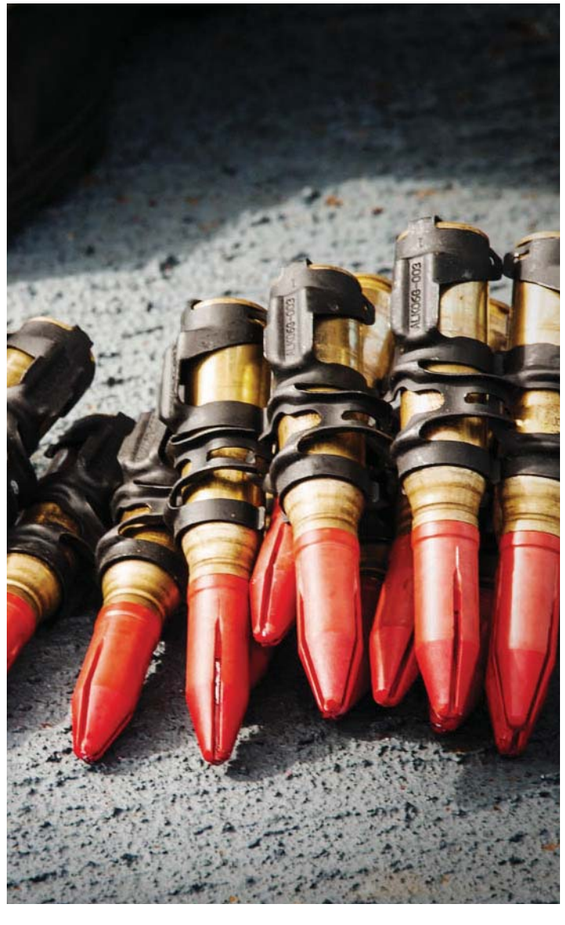
Within the context of multilateral discussions, DAER also continued to collaborate and maintain a close working relationship with the United States Department of Defense Explosives Safety Board, the United Kingdom Defence Ordnance Munitions and Explosives Safety Regulator and the Australian Directorate of Ordnance Safety.

CONCLUSION

Significant progress has been made towards completing the final volumes of the Ammunition and Explosives Safety Manual while at the same time ensuring that the existing volumes are kept up to date through the policy review cycle outlined above. DAER is the lead for this activity and, through engagement with stakeholders, ensures policies remain accurate and current, thereby meeting the needs of the community.

PICTURE ON THE RIGHT: *A CH124 Sea King maritime helicopter deploys flares during flight operations as HMCS ST JOHN'S crosses the Mediterranean Sea during Operation REASSURANCE, on May 22, 2017.*

AMMUNITION AND EXPLOSIVES COMPLIANCE



INTRODUCTION

The ammunition and explosives safety inspection (AESI)[7] forms the cornerstone of regulatory compliance. The AESI is used to report on the health of A&E safety within the DND and the CAF at the command, base and unit levels. While the Ammunition Program (AP) consists of nine elements, only Elements 1, 2, 4 and 7 will be discussed within this first rendition of a revised annual report, as only these elements have been subject to A&E safety compliance activities for the reporting period. The remaining elements will appear in subsequent annual reports as their respective AESIs are developed and incorporated into the risk-informed compliance model. Whereas observations against infrastructure were previously reported under Element 4 – A&E Operations Support and Readiness, they will now be reported under Element 7 – A&E Infrastructure.

COMPLIANCE - AMMUNITION PROGRAM ELEMENTS

Element 1 – A&E Regulation

DAER is identified as the office of primary interest (OPI) for Element 1 of the AP. It plays a distinct role by establishing A&E safety orders and directives affecting all AP elements, performing compliance assurance of level one organizations against the established regulations and by managing the Ammunition and Explosives Safety Program (AESP). Where DAER executes risk-informed compliance assurance throughout the AP, the intent is to subject DAER to a quinquennial review by the Assistant Deputy Minister (Review Services) (ADM(RS)), the results of which will be highlighted within this section of the annual report. Considering that the last review by ADM(RS) (then Chief Review Services) occurred in 2005, an ADM(RS) Evaluation was initiated during the reporting period, with results expected to be presented to DAER in August 2017. Findings and resulting management action plans will appear in the DAER annual report for FY 2017/2018. Consequently, DAER will be subject to a follow-on evaluation in FY 2022/2023.

[7] As per C-09-005-001/TS-000 Program Management and Life Cycle Safety, the AESI defines the requirements for Ammunition and Explosives Safety Program review by qualified and authorized specialists.

Element 2 – A&E Equipment Program Management

The Assistant Deputy Minister (Materiel) (ADM(Mat)) and the Canadian Special Operations Forces Command (CANSOFCOM) are identified as the OPIs for Element 2 of the AP. During the reporting period and as part of implementing compliance assurance over Element 2 of the AP, DAER and ADM(Mat) have been engaged in developing a specific AESI. This effort will continue throughout the first half of FY 2017/2018 and will subsequently include CANSOFCOM with the intent of initiating A&E safety compliance activities in FY 2018/2019.

Although a comprehensive AESI for Element 2 has yet to be established, some observations were made during the reporting period, the results of which are presented in the following paragraphs.

- Demilitarization and Disposal. Subject to environmental, technical, safety and controlled goods constraints, the limited large-scale institutional capability for demilitarization and disposal continues to represent a capability deficiency in enabling the life cycle materiel management function of the Equipment Program Management community.

  There are two types of disposal operations, destructive (destruction/demilitarization) and non-destructive (sale/donation). This year witnessed an overall decrease of holdings of A&E earmarked for disposal. This was predominantly the result of disposal by sale of salvage through ADM (Mat). Notwithstanding, there remains an underlying issue with the accumulation of A&E awaiting disposal by demilitarization/destruction.

An exercise candidate prepares a Mk83 GP bomb for disposal during Exercise TAZ TORNADO in 4 Wing's Jimmy Lake Range, near Cold Lake, Alberta on September 14, 2017.

  The total storage volume required to store the current inventory of A&E awaiting disposal is estimated to be 22 magazines; this is a decrease of two magazines when compared to FY 2015/2016, equating to approximately 800 pallets. The Canadian Materiel Support Group's (CMSG) annual A&E disposal exercise, EX DUSTY THUNDER, continues to play a significant role in mitigating the current stockpile of surplus, obsolete, deteriorated and time-expired A&E. However, the average rate of disposal is generally not keeping pace with that of accumulation. The absence of an institutional demilitarization/destruction facility/strategy is a recurring observation and continues to represent a capability deficiency, which harbours a potential safety concern associated with the requirement to store time-expired, deteriorated, obsolete and/or surplus A&E.

  ADM (Mat) continues to seek contracted solutions for disposal of the remaining 86,000 Canadian Rocket Vehicle-7 rocket motor stockpile, and the more than 80,000 155mm M119 Red Bag propelling charges currently listed in the Canadian Military Surplus Assets online system. A detailed breakdown of the complete current inventory of the A&E awaiting disposal can be found on the DAER intranet site. http://materiel.mil.ca/en/joint-common-ammo-explosives/controlled-documents.page.

- Periodic Inspections. Periodic inspections safeguard against A&E degradation and unsafe storage conditions of A&E, and ensure stock serviceability. In August 2016, DAER conducted a 100% safety compliance audit and evaluation of the periodic inspections recorded in the Ammunition Information & Maintenance System (AIMS) and noted that there were 3105 overdue periodic inspections. The lapse in inspections places the safety and serviceability of the A&E in question. The results were communicated to ADM (Mat) who, as the functional authority for materiel and inventory management, has taken measures to resolve the issue over the next reporting period. While ADM (Mat) plays a pivotal role in establishing the time intervals for A&E inspections, all organizations must conduct periodic

inspections in accordance with policy[8] . Further, the annual level one AESI against element 4, executed by the level one ammunition technical authorities (L1 ATA), must be leveraged to make observations and bring about corrective measures at the unit level.

Element 4 – A&E Operations Support and Readiness

During the reporting period, L1s having a responsibility for the safe storage, handling and management of A&E at first, second and third line facilities were subject to A&E safety compliance assurance. The Royal Canadian Navy (RCN), Canadian Army (CA), Royal Canadian Air Force (RCAF), Canadian Joint Operations Command (CJOC), CANSOFCOM, ADM (Science and Technology) and ADM (Mat) are identified as the OPIs for Element 4 of the AP.

- Ammunition and Explosives Safety Inspection. The overall indicative health of the AESP is most easily captured by the aggregate AESI health scores, which summarize the results of the inspections within each level one organization across the seven pillars of the inspection tool (Table 4). Interpreting these aggregate results, A&E safety continued to improve and has established a healthy, steady state of implementation and execution across DND and the CAF.

  The overall execution and reporting of the AESI is mature and well understood at the strategic and operational levels. The AESI improvement initiative[9] developed in consultation with the L1s and their respective ATAs continued throughout the reporting period with implementation planned for FY 2017/2018. This will be facilitated through the Ammunition and Explosives Safety Information Management System (AESIMS) Release 2, planned to be introduced before the end of FY 2017/2018. This capability will greatly assist the analytic ability of all users while simplifying and improving the creation and staffing of compliance inspection reporting. Concurrently and considering the overall indicative health of the AESP, the AESI scoring values will be scrutinized to determine baseline standards and if thresholds should be adjusted upwards. The L1 ATA working group continues to be a major coordination venue for the AESI update initiative. L1 ATA input for this reporting period can be found at the end of the compliance section in this year's annual report.

- A&E Licensing. Explosives storage licensing is predicated on a five-year review cycle. A compliance evaluation of L1 A&E storage licences against information retrieved from AIMS was conducted by DAER in October 2016. There are 24 second line ammunition facilities and four Canadian Forces Ammunition Depots (CFADs) that manage the warehousing of A&E based on the information recorded in AIMS. Of these, no unit was found to be 100% accurate in matching their A&E storage licences to the information found in AIMS[10] . Findings were promptly communicated to the affected level one organizations, the majority of which implemented remedial measures within the reporting period. The implementation of remedial measures by the RCAF remained outstanding at the close of the fiscal year. The RCAF and DAER will collaboratively address the issue in the coming year.

  As a corollary to the evaluation, it was determined that a number of facilities were operating with expired licences. Planning for licence renewal is key to maintaining valid and authorised licences. Operating with inaccurate or expired licences is a safety concern that increases the potential consequences of a catastrophic event. L1s must maintain oversight of this critical safety issue and use the annual AESI as an opportunity to observe on their respective facilities. A letter was sent by DAER to affected level one organizations requiring remediation. DAER will conduct a follow-up compliance evaluation in February 2018 and will continue to monitor licence currency on an annual basis. Again, the annual L1 AESI executed by the L1 ATA must be leveraged to make observations and bring about corrective measures, as applicable.

- A&E Risk Management. The AERASC is a risk-based tool to assist commanders in identifying issues and situations that fall outside extant departmental A&E policies. AERASCs are typically a temporary solution to an identified deficiency. The tool has been used to good effect by A&E practitioners across several level one organizations, both domestically and internationally. The process is maturing and the introduction of A&EI 57 in 2015 has enabled DAER to maintain oversight through a Technical Review Board (TRB). AERASCs must be reviewed annually by the L1 organizations to confirm their validity and continued requirement, and that proposed mitigating measures have been implemented to reduce safety risks to as low as reasonably practicable. There are currently 11 AERASCs in place across several level one organizations supporting risk-based licences. Nine of the risk-based licences are related to domestic situations where infrastructure is not fit for purpose, as the affected buildings do not meet extant licensing criteria to store the A&E currently held. L1s are accepting risk through the AERASC process to offset infrastructure deficiencies.

TABLE 4 – AGGREGATE ELEMENT FOUR AESP HEALTH RATINGS

L1	Safety Program	Storage	Operations	Transport	Disposal	Emergency Preparedness	Administration
RCN						↑	
CA						↑	
RCAF		↑			↑		
CJOC							
CANSOFCOM		↑					
ADM(S&T)							

	Aggregate L1 average score is over 75% for the element.
	Aggregate L1 average score is between 60% and 75% for the element.
	Aggregate L1 average score is below 60% for the element.
↑	Improvement since previous annual report.
→	Status quo since previous annual report.
↓	Degraded since previous annual report.
Note	All green elements without arrows scored same category as 2015

[8] C-74-300-B02/NJ-000, Ammunition and Explosives Manual, Inspection of Ammunition.
[9] This initiative commenced in FY 2015/2016 as an ongoing collaborative process with all L1 organizations.
[10] C-09-005-002/TS-001, Ammunition and Explosives Safety Manual, Volume 2, Storage and Facility Operations.

Royal Canadian Air Force weapons systems specialists from 401 Tactical Fighter Squadron prepare training weapons for use during the Weapons Systems Evaluation Program held at Tyndall Air Force Base, Florida, January 31, 2017 as part of Exercises COMBAT ARCHER and COMBAT HAMMER.

Element 7 – A&E Infrastructure

The Assistant Deputy Minister (Infrastructure and Environment) (ADM(IE)) is identified as the OPI for Element 7 of the AP.

- Portfolio Characterization. As the custodian for real property and immovables, ADM(IE) is currently in its second year of a three-year facility condition assessment (FCA) to establish the condition of the infrastructure within its portfolio. The FCA initiative includes infrastructure having a real property replacement cost greater than $1M, which addresses most, if not all, dedicated A&E storage facilities. Once validated, the information collected will be uploaded into the Defence Resource Management Information System and used by ADM(IE) to prioritize portfolio requirements and allocate resources. To date, ADM(IE) has captured the condition of more than 1500 of the 3200 assets to be assessed, a portion of which are related to A&E. The FCA is scheduled for completion by end of FY 2017/2018, with an intent

[11] CAF Ammunition Program Infrastructure Study.

to follow industry best practice, which requires that this data set be refreshed every five years. In parallel to this study, the Strategic Joint Staff (SJS) is conducting a first-principles analysis[11] of the AP infrastructure with the intent of informing senior management for long-term decision-making, as well as on AP real property and Infrastructure (RP&I) investments and divestments. The study will be comprehensive, encompassing all aspects of the AP infrastructure at the strategic, operational and tactical levels. A key part of this study will be the determination of optimal locations, capacity and capability for A&E processing, storage and warehousing, and distribution networks.

CANADIAN LONG SPAN EARTH-COVERED MAGAZINE (CLSECM)

During this reporting period, there were two issues of significance related to the Canadian-unique design of earth-covered magazines. The first concerned the equivalent NATO designation[12] for both the small and large variants of the magazines and the second involved the earth cover atop the newly built magazines at CFAD Bedford[13]. Although distinct, both issues affected the explosives storage licensing criteria of the designs, affecting magazine storage capacity and presenting potential safety concerns if left unaddressed.

- Equivalent NATO designation. ADM(IE) commissioned Baker Engineering to validate the designs using plans from CFAD Angus (large variant CLSECM) and CFAD Bedford (small variant CLSECM). The study was completed in March 2017 with results presented to DAER and ADM(IE). Baker Engineering's assessment supported a 7-bar NATO rating for the small variant and a 3-bar rating for the large variant. Acceptance of the study results is pending ADM(IE)'s review as the functional authority for real property and immovables life cycle for the department. If endorsed, the small and large variants will be recognized as 7- and 3-bar respectively, and the extant moratorium on the construction of new CLSECMs can be rescinded[14].
- Earth cover. An observation by CFAD Bedford personnel raised concerns over the construction standards of the newly built CLSECMs. In February 2017, a report by Conquest Engineering confirmed that the depth and quality of earth cover on the newly constructed A&E storage facilities did not meet departmental design criteria for a 3-bar licensed magazine. In addition to representing a potential safety risk, the current shortfall drastically reduces the explosives storage capacity of the facilities and depot. As an interim measure and pending an ADM(IE) led investigation, CJOC amended the licences of the seven magazines, reduced the storage capacity of the affected facilities and redistributed the stores commensurate with departmental regulations.

CONCLUSION

While there remain opportunities for improvement, the department has reached a steady state for Element 4 of the Ammunition Program through the application of its AESI. However, compliance continues to be dominated by corporate level departmental issues associated with Elements 2 (A&E disposal) and 7 (A&E infrastructure).

Despite the overall decrease in A&E slated for disposal in FY 2016/2017, the accumulation of A&E for demilitarization/destruction is occurring at a significant rate. This poses potential safety concerns when linked to the lapse in periodic inspections on the affected stockpiles and the deteriorating conditions of some of the storage facilities. The infrastructure portfolio remains a major source of dissatisfaction in terms of highlighted deficiencies as witnessed by the number of related AERASCs and compliance observations. The addition of new analytical tools within AESIMS will enhance the L1s' ability to identify and track known areas of concern such as A&E licensing and periodic inspections. The department will gain additional clarity around the corporate disposal and infrastructure issues as the AESIs for Elements 2 and 7 are developed and implemented in consultation with L1s over the coming year.

[11] CAF Ammunition Program Infrastructure Study.

[12] NATO designates magazines by the overpressure rating on the headwall and doors.

[13] NATO policy for earth covered magazines requires a minimum of 0.6 m in depth to be classified as earth covered. Without the appropriate earth cover, the magazine may not provide adequate protection from incoming projectile hazards or fire events.

[14] 11300-23 (DAER 2-6, OTT_LSTL RDIMS# 3788293) dated 02 December 2014.

L1 ATA INPUT

The L1 ATA is responsible for creating and maintaining an AESP, which is validated during the AESI cycle. A great deal of effort is applied to ensure the level one organization's A&E safety through compliance and the provision of advice. It is important to recognize the value of the relationship and synergy between DAER and level one organizations. This is mainly achieved through day-to-day engagement between DAER and the L1 ATAs. The following paragraphs capture salient points as raised by L1 ATAs on behalf of their organizations.

RCN ATA

The RCN ATA conducted annual compliance verifications on the two naval formations this year. The RCN AESP was found to be in good order with only minor housekeeping issues. The liaison between the formation ammunition technical officers (FATO), the formation ammunition inspectors and the L1 ATA remains positive and effective. Of particular note is the migration of the base explosives safety officers (ESOs) from the general safety organizations to the FATO umbrella on both coasts. This is seen as a more logical approach to the administration of the AESP throughout the RCN. A new AESI tool for Her Majesty's Canadian Ships has been implemented with success. Overall, it was a positive year.

CA ATA

The CA has maintained its healthy AESP from last year with no inspection failures. Of note is the fact that more ammunition facilities achieved all green elements in two consecutive AESIs. There has been progress on the emergency preparedness element but there is still a requirement for improvement in some locations. The CA will pay particular attention to A&E accident/incident reporting through the newly established UESO network. The CA will focus on the administration and disposal pillars of the AESI during the 2017/2018 inspection cycle. In addition, under the current and proposed revision of publications, the CA will pay specific attention to the inspection of unit A&E storage licences. The state of A&E infrastructure continues to be a mission degrader within the CA.

RCAF ATA

The RCAF AESP continues to operate at an acceptable level of safety and is assessed overall as healthy with areas for improvement. Personnel issues were considered a root cause of the majority of AESI observations due to a lack of experience and training and increased workload. The updated A&E Management for Aerospace Operations course syllabus from 2014 helped improve the overall RCAF AESP. The release of the UESO course in 2016 will serve to improve the administration and oversight of the RCAF AESP. The new air weapon systems (AWS) technicians are now posted to the wings and the re-integration of the AWS technicians is ongoing. Aging A&E infrastructure across the RCAF is extensively deteriorated and will need to be addressed in the immediate future.

CJOC ATA

CJOC units continue to maintain a robust AESP. For CMSG facilities in particular, the declining state of infrastructure remains the most significant concern. Other observations pertain to the administration and storage pillars: specifically, deficiencies in warehousing practices and discrepancies within inventory management controls. Within the context of deployed operations, progress on AESP development and application is ongoing. The CJOC Headquarters AESP is still under review.

MILITARY PERSONNEL COMMAND (MILPERSCOM) ATA

This year MILPERSCOM continued to improve on its A&E safety through the efforts of its L1 ATA and subordinate UESOs and subject matter experts. Continued progress was made at CFB Borden to raise the awareness of A&E accident/incident reporting requirements amongst the organizations within its area of operations. The Base Explosives Safety Officer made concerted efforts along with the support of the staff at CFAD Angus to ensure that reporting requirements were reinforced, which resulted in a better culture of reporting. The very rigorous processes instituted by base operations staff regarding the operation of ranges on the base have also resulted in very few incidents and accidents. When some did occur, they were reported and qualified individuals conducted investigations. This is a marked improvement over past years and will continue in the future. As mentioned in previous annual reports, changes in the weapons training processes at Canadian Forces Leadership and Recruit School (extensive use of the simulator prior to range exercises) have greatly reduced the number of accidental small arms weapons discharges (ASAWDs) to a level that is near zero. This ongoing practice ensures not only greater success rates for recruits undergoing training but has also made the conduct of this training much safer. MILPERSCOM is still developing its overarching AESP with the expectation that it will be finalized and implemented during the next reporting cycle. It will continue to work with DAER and CJOC L1 ATA where required to ensure the highest level of A&E safety possible for its organizations and personnel.

ADVOCACY

INTRODUCTION

The aim of the DND and the CAF AESP is to prevent accidental bodily harm, and to prevent damage to materiel, facilities, infrastructure and the environment. It ensures personnel have safe and effective means to either carry out or support the mission. The success of the AESP is predicated on: top-down engagement by leadership and overall institutional awareness of A&E safety; and bottom-up execution by the individual holding a thunderflash, the crew of a light armoured vehicle, the technician uploading a missile, or the sailor loading 57mm naval gun ammunition. If these daily tasks are not accomplished within the context of a strong safety culture, there is a risk of loss of life, assets or capabilities.

Annual reports have historically provided corporate statistics on A&E occurrences. The level of effort usually associated with collecting the information from various sources at the end of the reporting year left very little time, if any, to conduct an analysis of the data and subsequently extract the "so what". In addition, the data collected was often incomplete or prone to error and the lack of structure further hampered comparability between the reporting communities and follow-on data analysis. With the advent of the Ammunition and Explosives Safety Information Management System (AESIMS), there is an opportunity to capitalize on real-time, structured data and consequently conduct more detailed data analysis, leading to meaningful conclusions and results.

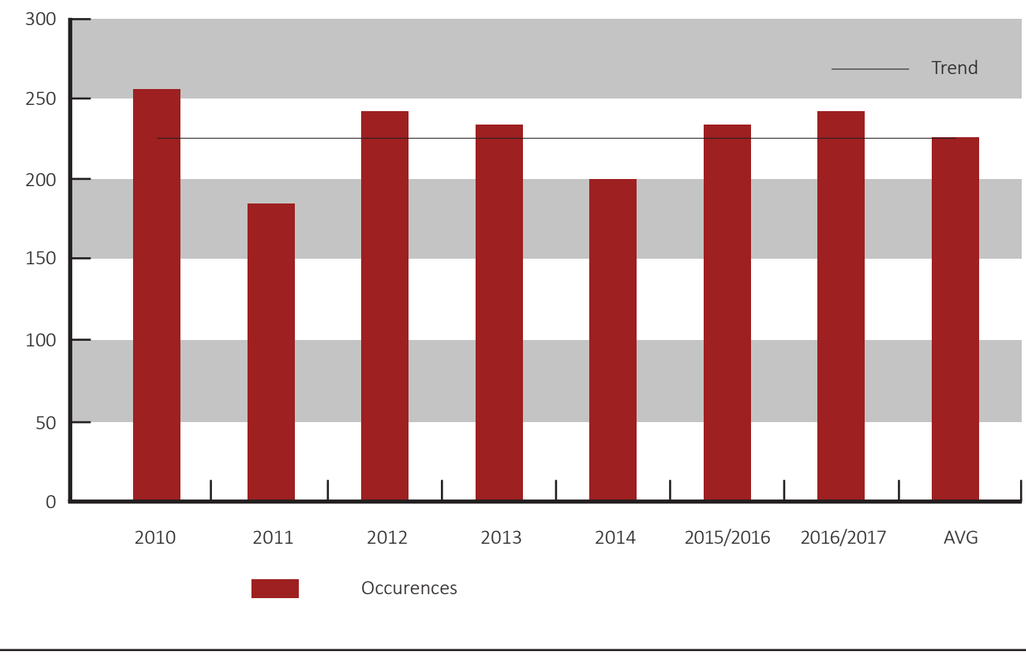
The introduction of AESIMS will trigger a strategic pause in statistical reporting. Over the next two years and associated reporting periods, DAER will "reset" the reporting schema and develop a statistical reporting capability through AESIMS that will provide better insight to the operational community.

As a result, this section is under review but will briefly discuss significant observations relating to recent AESP initiatives. This section will also provide a high-level overview of occurrences within the reporting period. The intent is to promote dialogue down to the unit level, and to illustrate the potential seriousness of any incident or accident involving A&E. Additional technical information is located on the DAER intranet site http://materiel.mil.ca/en/joint-common-ammo-explosives/analysis.page

OCCURRENCE ANALYSIS OVERVIEW

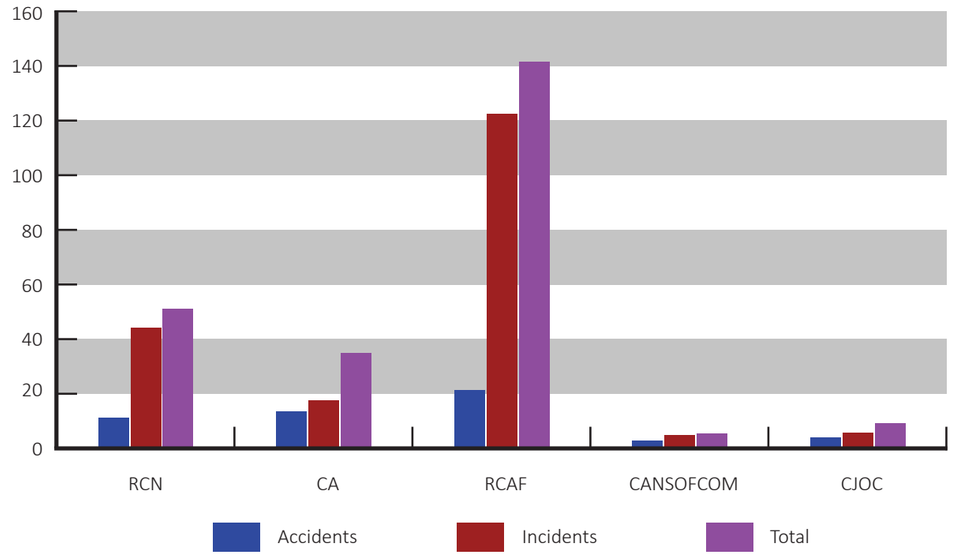
As represented in Figure 1, the total number of reported occurrences[15] for FY 2016/2017[16] was slightly above the seven-year average with 242 occurrences: 52 accidents and 190 incidents. Land and common user natures[17], as well as natures frequently used by the RCN and RCAF, continue to be involved in a high percentage of reported occurrences, representing 22 accidents. There were nine reported injuries, of which three were attributable to human error. There were eight injuries (up from seven in 2015) that were not reported through the AESP[18], seven of which resulted in temporary hearing loss.

FIGURE 1 OCCURRENCES FROM 2010 TO 2016



[15] Accidents and incidents.
[16] Prior to FY 2015/2016, DAER annual reports were based on the calendar year.
[17] Items that may be used by all CAF members, regardless of environment (RCN, CA, RCAF).
[18] Gleaned from DND General Safety Program records.

FIGURE 2 OCCURRENCES FOR FY 2016/2017



If we accept that for every accident reported, there are fifteen incidents[19], then we believe there is a problem with reporting within the DND/CAF. This observation is buoyed by an analysis of two areas. The first is the ratio of incident to accident reports within DND and the CAF. Historical analysis shows a low ratio of reported incidents to accidents (table 5). The second indicator is that occurrences reported through the general safety and disciplinary venues differ from those reported through the AESP. Figure 2 shows the distribution of accidents and incidents by L1[20].

While A&E hazardous occurrence reporting is occurring within the DND/CAF, the inconsistency in reporting and the poor quality of reports continue to represent a significant concern. Timely and accurate reporting would allow for better organizational situational awareness over potential safety risks, would enhance decision-making and would contribute towards personnel/equipment safety and mission success.

TABLE 5 – ACCIDENT/INCIDENT RATIO

Reporting Year	Ratio of Incidents to Accidents
2016	3.65
2015	2.67
2014	3.17
2013	3.50
2012	2.98
2011	2.98

CAUSE FACTORS

Of the 242 occurrences in FY 2016/2017, most investigations were completed and a cause attributed, as summarized at Table 6. Personnel were responsible for 70% of all accidents and incidents. Carelessness, poor judgement and errors in drill, sometimes compounded by lack of supervision, were typical causes.

[19] For each major injury (fatality, disability, lost time or medical treatment) there were 9.8 minor injuries (requiring only first aid). For every major injury, there were approximately 600 incidents; representings a ratio of 15 incidents for each accident. See Bird F. (1974), Management Guide to Loss Control, Atlanta, GA: Institute Press.

[20] The responsible L1 may be the L1 responsible for the support base, not the L1 with functional command.

Deliberate deviations are willful contraventions of procedures and represented 5% of occurrences. There were 11 deliberate deviations reported in FY 2016/2017, down from 21 in 2015[21]. While there was a relative year-to-year decline in deliberate deviations, their existence suggests continued emphasis on L1 AESPs is required.

UNIT AMMUNITION REPRESENTATIVE AND UNIT EXPLOSIVES SAFETY OFFICER TRAINING

UAR and UESO training was made available in April and May of 2016 respectively, through Canadian Forces Logistics Training Centre distance learning courses. This addressed a long-standing capability training gap for qualified UARs and UESOs. The training and the in-service AESIMS

TABLE 6 – CAUSE CATEGORIES

Cause Category	Number	Personnel Related
Human Error (error in drill, mistake, poor judgement)	158	169
Deliberate Deviation	11	
System or Weapon-related	18	
Other Causes	33	
Unassigned (investigation on-going)	8	
Ammunition-related (defect, malfunction, design error)	14	
TOTAL	**242**	

electronic reporting tools will enable commanders and their representatives to better understand the tenets of A&E safety and facilitate timely reporting.

Effective 1 April 2017, most units will require a qualified UESO and a qualified UAR to receive or store A&E. Units storing and using ammunition only through registered locations will not require a UAR but will require a qualified UESO. The delivery of the courses was achieved following close collaboration between Military Personnel Command and the L1 ATA and is regarded as a strengthening of the DND and CAF AESP.

[21] DAER transitioned reporting cycles from calendar to fiscal year in the report ending 31 March 2016.

COMMUNICATIONS

DAER continued to support the Occupational Health and Safety Digest with articles, and intra-unit A&E safety training through the vignettes (topical safety presentations) distributed through the DAER Defence Information Network site and the Learning Portal, respectively.

Development of a communications strategy and implementation plan continued during the reporting period. DAER is engaged with the Assistant Deputy Minister (Public Affairs) to create a comprehensive strategy to increase departmental awareness of DAER's mandate and role, tools available to L1 advisors and their ATAs and, more importantly, the AESP.

ELECTRONIC TOOLS

The Assistant Deputy Minister (Information Management) (ADM(IM)) and ADM(Mat) provided continued support throughout the year in an effort to complete and roll out Release 1 of the AESIMS tool by 1 April 2017. To be initially available to the practitioner community, Release 1 will allow for the electronic reporting of:

- A&E accidents and incidents; and
- A&E defect and malfunction reports.

Once distance-learning packages are available in both official languages, AESIMS Release 1 will be made accessible to the remainder of the DND and CAF A&E community while also enabling reporting ASAWDs. This is expected to occur prior to FY 2017/2018 end.

The Information Management Group continued development of AESIMS Release 2 that will add the following functionality:

- A&E Safety Inspections and Surveys;
- A&E Licensing and Storage, including waivers; and
- Risk Management.

Release 2 is expected prior to FY 2017/2018 end.

AESIMS will greatly contribute towards DND's and the CAF's ability to accurately analyze, report, and monitor Ammunition Program activities.

L1 AMMUNITION TECHNICAL AUTHORITIES

One of the main responsibilities of L1 ATAs is to develop, implement, monitor and evaluate an AESP within their Command, fostering best safety practices in all aspects of A&E management[22].

The eighth DAER annual report sought to determine the state of the L1 ATA network and produced a listing of ATAs by L1 organization. A revision of the information provided revealed further effort is required to ensure each L1 requiring A&E advice and support has either an appropriately trained and qualified ATA or a documented agreement with another L1 for that support. DAER will work with L1s to guide the development of a robust ATA network.

CONCLUSION

The recent introduction of the UESO and UAR courses, in addition to the forthcoming introduction of the AESIMS reporting tool, should greatly facilitate timely and accurate A&E occurrence reporting.

While DAER's initial thrust of activities was to establish a functioning A&E regulating body and a corporate level AESP, there will be a concerted effort in the years to come to broaden and deepen the knowledge of the AESP within DND organizations and CAF units. Through the development and implementation of a strategic communications strategy, together with an in-house capability to conduct meaningful statistical analysis, DAER aims to elevate the importance of A&E safety within the department and strengthen the reporting culture.

Through the development of a corporate A&E communications strategy, DAER also aims to increase overall corporate participation in and awareness of the AESP at the unit, base, and command levels.

[22] C-09-005-001/TS-000 Ammunition and Explosives Safety Manual, Volume 1, Program Management and Life Cycle Safety.

PICTURE ON THE RIGHT: *Members from 1 Royal Canadian Horse Artillery Z Battery of the Canadian Armed Forces fire the M777 Howitzer guns that have been deployed in support of NATO's enhanced Forward Presence Battlegroup Latvia as part of Operation REASSURANCE, at Camp Ādaži, Latvia, on September 10, 2017.*

WAY FORWARD

MEASURING AMMUNITION AND EXPLOSIVES SAFETY THROUGH A CORPORATE LENS

By expanding regulatory oversight to include a comprehensive safety review of all Ammunition Program elements, the Director Ammunition and Explosives Regulation will be positioned to more effectively and accurately report on ammunition and explosives safety activities under the direction or control of the Minister of National Defence[23].

In an effort to continue improving on the reporting culture within the Department of National Defence and the Canadian Armed Forces, the Director Ammunition and Explosives Regulation will work with level one organizations to develop and deliver a comprehensive communication strategy similar to that currently delivered under the leadership of the Director Flight Safety. The intent is that, through similar efforts, ammunition and explosives safety awareness will increase and contribute towards a safer ammunition and explosives environment.

As safety compliance activities evolve, so will the structure and content of the annual report. While it was thought possible to accomplish this task by end of fiscal year 2017/2018[24], it has been recognized that level one stakeholder engagement is key to the successful development and implementation of compliance assurance activities specific to each element. As a result, the Director Ammunition and Explosives Regulation is aiming to complete its transformational initiative by end fiscal year 2019/2020.

[23] CANFORGEN 168/06 ADM MAT 006 101044Z NOV 06.

[24] DAER Annual Report 2015/2016.

Members of Royal Canadian Armoured Corps School (RCACS) practice their shooting skills from a Leopard II tank at firing point 4 in the training areas at 5th Canadian Division Support Group (5 CDSG) Gagetown, in Oromocto, New Brunswick, May 4, 2017.

CONCLUSION

Initiatives designed to strengthen the regulatory safety framework and decrease potential safety risks to the department have continued throughout the reporting period. The ammunition and explosives safety manual have been rewritten and are now subject to a cyclical three-year review while the ammunition and explosives risk assessment safety case has been fielded and the community will soon benefit from the rollout of the Ammunition and Explosives Safety Information Management System.

Acknowledging the steady improvement witnessed over the years assessing Element 4 of the Ammunition Program, there is a requirement to expand the current compliance assurance model to address all elements of the Ammunition Program, as applicable. The annual report will evolve accordingly to reflect this requirement.

The next two reporting periods will continue to witness change in the execution of safety compliance assurance for the department. In consultation with level one organizations, the Director Ammunition and Explosives Regulation will establish a comprehensive Ammunition Program-based, risk-informed compliance assurance model. Through increased engagement throughout the community, this initiative will greatly improve ammunition and explosives safety awareness within the department, leading to informed decision-making and an improvement in the ammunition and explosives safety culture across the department.

Soldiers from 2 Canadian Mechanized Brigade Group (2 CMBG) participate in TOW launch training, in a training area at the 5th Canadian Division Support Group (5 CDSG) Gagetown, in Oromocto, New Brunswick, February 27, 2017.

PHOTO CREDITS

Cover
Photos: OP IMPACT, DND
Cpl Carbe Orellana, MARPAC Imaging Services
Cpl Jordan Lobb, Canadian Forces Combat Camera
Cpl Michael Bastien, MARPAC Imaging Services

Page 4
Photo: MCpl Charles A. Stephen, Formation Imaging Services Halifax

Page 6
Photo: Cpl Jay Ekin, Operation REASSURANCE Land Task Force Imagery Technician

Page 9
Photo: Cpl Gary Calvé, Imagery Technician ATF-Iceland.

Page 10
Photo: Cpl Carbe Orellana, MARPAC Imaging Services

Page 13
Photo: Cpl Andrew Wesley

Page 14
Photo: Canadian Forces Combat Camera, DND

Page 17
Photo: LS Olge Henry, Formation Imaging Services.

Page 18
Photo: Cpl Carbe Orellana, MARPAC Imaging Services

Page 19
Photo: Avr Caitlin Paterson, 4 Wing Imaging

Page 21
Photo: Avr Cody R. Miller, U.S. Air Force

Page 24
Photo: Cpl Jordan Lobb, Canadian Forces Combat Camera

Page 29
Photo: Sgt Bernie Kuhn, Task Force Latvia

Page 30
Photo: MCpl Brandon O'Connell, Imagery Technician, 3rd Cdn Div PA

Page 31
Photo: Cpl Geneviève Lapointe, Tactics School, 5th Canadian Division Support Group Gagetown

Page 32
Photo: MS Peter Reed, Formation Imaging Services Halifax

Page 33
Photo: Cpl Geneviève Lapointe, Tactics School, 5th Canadian Division Support Group Gagetown

RESOURCES

Ammunition & Explosives Orders and Directives and related publications
http://materiel.mil.ca/en/joint-common-ammo-explosives/policies-directives.page

NATO Munitions Safety Information Analysis Centre (MSIAC) Tools and Resources
http://www.msiac.nato.int/

The Defence Terminology Bank (DTB) Definitive A&E related definitions
http://terminology.mil.ca/index-eng.asp

NATO Standardization Document Database (NSDD)
http://nso.nato.int/nso/nsdd/listpromulg.html

Allied Logistics Publication (ALP) 16 – Explosives Safety and Munitions Risk Management (ESMRM) in NATO Planning, Training and Operations
http://nso.nato.int/nso/nsdd/APdetails.html?APNo=1592

NATO Allied Ammunition Storage and Transportation Publication 1 (AASTP-1) – NATO Guidelines for the Storage of Military Ammunition and Explosives
http://nso.nato.int/nso/nsdd/apdetails.html?APNo=1981

Landing page for information related to ammunition and explosives (A&E)
http://materiel.mil.ca/en/joint-common-ammo-explosives/index.page

Various analysis products related to A&E
http://materiel.mil.ca/en/joint-common-ammo-explosives/analysis.page

Articles related to explosives safety
http://materiel.mil.ca/en/joint-common-ammo-explosives/articles.page

Briefings and presentations
http://materiel.mil.ca/en/joint-common-ammo-explosives/briefings-presentations.page

DVDs related to explosives safety
http://materiel.mil.ca/en/joint-common-ammo-explosives/dvds.page

Explosives safety posters
http://materiel.mil.ca/en/joint-common-ammo-explosives/posters.page

Licences and Waivers
http://materiel.mil.ca/en/joint-common-ammo-explosives/licences-waivers.page

Tools and Resources
http://materiel.mil.ca/en/joint-common-ammo-explosives/tools-resources.page

WOULD YOU CARE TO GAMBLE?

VOULEZ-VOUS JOUER?

With explosives, the game is for keeps!
Avec des explosifs, le jeu devient mortel!

DND Ammunitions & Explosives Safety Program
A-JS-000-098/DA-031