National Defence / Défense nationale

Director Ammunition and Explosives Regulation Annual Report

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

A Review from 1 January to 31 December 2011

Canada

Cover Photo:

An Air Weapons Systems Technician from 425 Tactical Fighter Squadron, Bagotville assembles a laser-guided GBU-12 bomb in Trapani, Italy, on April 4, 2011.

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Able Seaman (AB) Jill Bagg fires the .50 calibre machine gun at an air target with assistance from AB Luc Pelletier and Petty Officer 1st Class (PO1) Kelly Webb. HMCS Vancouver *conducted machine gun training while on patrol in the Mediterranean Sea.*

Executive Summary

The fourth annual report from the Director Ammunition and Explosives Regulation (DAER) to the Deputy Minister (DM) and Chief of Defence Staff (CDS) provides an independent analysis of the state of the Ammunition Program for the calendar year 2011 and an overview of the main activities from the regulator's office, including the planned activities of the next two year cycle. Overall, the annual report aims to provide recommendations and concrete actions from the DAER program of work to continue moving the Ammunition and Explosives (A&E) regulatory and safety agenda forward.

As in past years, the report examines key areas such as: compliance verification of selected activities in the A&E life cycle, policy development, A&E safety related training, advocacy activities, and trend analysis of A&E accidents and incidents.

The 2011 A&E compliance verification program, as laid out in the annual compliance activity coordination letter, focused on a number of activities, which included: initial results from the recently implemented A&E Safety Surveys and Safety Inspections (AESS and AESIs), review of avalanche control activities to ensure safe A&E management, renewal of A&E storage licences, mission transition activities in Afghanistan, and inventory control and management which included lessons learned during Op MOBILE.

The 2011 compliance activities yielded findings of significance to commanders at all levels. Established metrics indicate a requirement to reinvigorate the DND/CF Ammunition and Explosives Safety Program (AESP). There is also evidence pointing to challenges in A&E expenditure reporting, timely adjustment transactions, and inventory control and management. While efforts to progress the DND/CF demilitarization capability to reduce Munitions Scrap (MS) and obsolete A&E stockpiles continue, the division of responsibilities for capability development has slowed progress of a project which has still not progressed beyond the SSID phase despite being under consideration for more than 10 years. Finally, both Op MOBILE and Op ATHENA saw many A&E related lessons observed that, for the success of future deployments, must become lessons learned or the potential will exist to repeat the same mistakes.

The program of work for 2012–2013 will again concentrate on follow up of past critical issues that continue to evolve. The only new compliance activities will be with ADM(IE) regarding UXO clearances on active ranges, and the examination of A&E waivers for RCAF air sovereignty operations.

The DAER A&E policy work in 2011 continued to focus on the updating of DAODs as well as progressing the new series A&E Safety Manuals. Many of the current Ammunition & Explosives Instructions (A&EIs) that have been published as interim policy documents will be superseded by the new volumes as they are promulgated. With the addition of an environmental engineer on deployment from DGE to DAER, increased environmental scrutiny of A&E policy was carried out.

In 2012–2013, DAOD 3002-1 — Certification of Ammunition and Explosives and DAOD 3002-2 — Insensitive Munitions should be published. Both DAOD 3002-0 (Ammunition and Explosives) and 3002-5 (Use of Firearms and Explosives) should be finalized during this period. The creation of the new risk management framework for A&E activities under DAOD 3002-7 should also be finalized during this period, with interim policy for operations being issued under a CANFORGEN and supporting A&EI in the first quarter of 2012. Further development and publishing of the new

C-09-005 series will continue with the publishing of Volume 1 — Program Management and Life Cycle Safety, Volume 2 — Storage and Facility Operations, and Volume 5 — Deployed Operations. With the assistance of DCAE, C-09-005-008/TS-000 Volume 8 — Construction and Design Standards will be further developed and will possibly include a relaxation of electrical standards for ammunition facilities. C-09-005-004/TS-000 — Demilitarization and Disposal will also be worked on to ensure that progress on the demilitarization project is not impeded due to a lack of enabling policy.

Additional policy work in 2012–2013 will also include an in-depth analysis of the US Web based Munitions Analytical Compliance Suite (MACS) for use by the DND/CF to predict A&E emissions for disposal activities, international collaborative work to develop Allied Joint Doctrine for explosives safety planning in operations — which will lead to CF Joint doctrine development, and an initiative to standardize A&E terminology in the Defence Terminology Bank (DTB) through DAER participation in the Joint Terminology Panel (JTP) and the establishment of the A&E Terminology Panel (AETP).

Work to develop the AESP continued unabated in 2011. Important policy re-work is well underway, tools continue to be developed for the A&E practitioner and data analysis of A&E occurrences is starting to indicate which areas need to be worked on in order to improve safety. Efforts will continue to reinforce the requirement to report A&E occurrences in order to improve trend analysis as an important part of A&E safety. There are limitations on access to A&E related publications due to the Controlled Goods Regulations; discussions with the Controlled Technology Access and Transfer (CTAT) office need to continue to ensure personnel can access the required information in a timely fashion. Finally, the creation of the Safety Information Management System (SIMS) project for electronic tools for the AESP is a concrete step forward that will deliver an initial capability in the 2013 timeframe.

Analysis of A&E accidents and incidents in 2011 has once again validated that, in the vast majority of reported cases, the ammunition or explosives worked as designed. Common User natures — those most frequently used and most familiar to CF personnel — continue to be involved in a high percentage of occurrences. Of the 182 reported occurrences, most events were the result of human error (83% — which is up from 72% in previous years). Deliberate deviations from procedures caused 15% of occurrences, comparable to 2010, including three injuries. Reporting of accidents and incidents, more specifically the lack thereof, continues to be a major concern, both during Force Generation and Force Employment. There is concern that many occurrences continue to go unreported within CA, CMP, CEFCOM and CANSOFCOM units.

The AESP program of work in 2012–2013 will see the completion of the rewriting of the main AESP manual, A-GG-040-006/AG-001 DND Explosives Safety Program, to ensure it is in-line with the latest health and safety standard, further development of educational and promotional products, the development of a multimedia archival database for major A&E accidents which have occurred in Canada, a recognition program, and a quarterly bulletin. It is also anticipated that initial capability for SIMS will be delivered in 2013 which should then permit further development of the follow-on requirements for the Ammunition and Explosives Safety Information Management System (AESIMS).

The report concludes with a qualitative assessment of where DND/CF presently stands with respect to the A&E safety agenda using five key elements of the Treasury Board Management Accountability Framework (MAF), which were tailored for the ammunition program in order to identify strengths and weaknesses. The overall status of addressing the five selected MAF assessment elements against ammunition program regulatory and safety performance was rated as either green (satisfactory action is being taken to address the deficiency); yellow (action is being taken, however additional resources are required); or red (no action being taken). Overall, the various initiatives are receiving the required attention; however a number of initiatives were rated as yellow, predominantly for the elements of risk management and stewardship. With increased management emphasis, specifically in the areas rated as yellow; it is believed that the five assessment elements could progress from an overall rating of "opportunity for improvement" to a rating of acceptable in the next two year period.

DAER's program of work in 2012 and 2013 will continue to focus on advancing or monitoring the progress of various initiatives under the five assessment elements in order to continue strengthening DND/CF's AESP, and to ensure due diligence in meeting the obligation to self-regulate as a result of the exemption from the *Explosives Act*.

Section 1
Introduction

MCpl Paul Mitchel, a student on the Army Patrol Pathfinder course, practices using a signal distress smoke during a swimming exercise.

The fourth annual report from the Director Ammunition and Explosives Regulation (DAER) to the Deputy Minister (DM) and Chief of the Defence Staff (CDS) aims to provide an independent analysis of the state of the ammunition program for the calendar year 2011, an overview of the main activities from the regulator's office, as well as the planned activities in the next two-year cycle (2012–2013) in order to continue moving the A&E regulatory and safety agenda forward.

In similar fashion to previous reports, the main body of text, which underwent extensive coordination with the applicable stakeholders within the respective L1 organizations, is subdivided as follows:

- **A&E Compliance Framework.** This section provides a follow-up on the compliance activities from previous annual reports, an analysis of the selected processes from the A&E life cycle as announced in the annual coordination letter to L1s as well as the projected program of work for calendar years 2012–2013;
- **A&E Policy Framework.** This section provides an update on policy developed in the last year as well as projected policy development for 2012–2013; and
- **A&E Safety Advocacy and Analysis.** This section contains the A&E accident and incident analysis of 2011 in comparison to previous years. Further, safety and advocacy program initiatives are covered, including the development of electronic safety information management tools for use by the ammunition program.

In order to provide a balanced review of where the DND/CF stands on the A&E safety agenda, the report concludes with an update of the progress of the rated Management Accountability Framework (MAF) elements introduced into the 2010 Annual Report. It is hoped that this update will provide senior leadership visibility of areas where progress is being made as well as opportunities for improvement in order to continue strengthening DND/CF's safety and regulatory regime.

Section 2

Ammunition and Explosives Compliance Framework

Task Force Iceland Aviation Systems Technicians Sergeant Gary Warbeck (left) and Corporal Tony Lizotte load a missile shipping case onto a trailer for transport to the ammunition magazine at Keflavik Air Base, Iceland on 8 April 2011.

Introduction

The 2011 Ammunition and Explosives (A&E) compliance program, as laid out in the annual compliance activity coordination letter,[1] focused on the following activities:

- Monitoring and reporting on the initial results of the conduct of A&E Safety Surveys (AESSs) and Safety Inspections (AESIs);
- Avalanche Control (AVCON) Activities to ensure safe A&E storage, disposal of surplus propellant and management of unexploded ordnance;
- Completion of the National A&E storage licence register;
- Mission transition activities in Afghanistan involving the safe management, return and disposal of A&E from Op ATHENA;
- Inventory control including initial lessons learned from Op MOBILE; and
- Follow-up of issues identified in previous reports.

[1] 11300-1 (DAER 4 RDIMS_OTT_LSTL-#2529650) dated 23 June 2011

A&E Compliance Activities from 2011 Call Letter

AESS and AESI Results

The revised A&E safety survey and inspection process[2] provides a formalized and standardized method of evaluating both A&E Safety Program (AESP) implementation and A&E safety compliance and replaces the previous explosives safety inspection of facilities process. The AESS consists of seven elements[3] and the L1 Ammunition Technical Authorities (L1 ATAs) must complete an AESS following a unit, CF Ammunition Depot (CFAD), base, or fleet L1 AESI. The AESS utilizes weighted scoring to provide commanders an overall assessment of A&E safety compliance. The score determines an L1 AESI frequency, between six and 36 months in six month increments and provides an evaluation of overall L1 AESP health.

[2] 11300-44 (DAER 2) A&E Instruction 32 (A&EI 32) — Ammunition and Explosives Safety Survey and Inspection dated 01 April 2011

[3] The elements are safety program, storage, operations, transportation, disposal, emergency preparedness, and administration.

Twenty-four L1 AESIs were completed with an average score of 85%, a high score of 99% and low score of 65%. Table 1 provides a listing of AESIs completed, required inspection frequency as well as remaining bases to be completed by the L1. Command level explosives safety inspections carried out before 30 March 2011 were not used as they were not conducted in accordance with Ammunition and Explosives Instruction (A&EI) 32.

TABLE 1 L1 AESI Results

LEVEL 1 ADVISOR	L1 AESIS PERFORMED	L1 AESIS REMAINING
Vice Chief of Defence Staff (VCDS)	0	1
ADM Science and Technology (ADM(S&T))	1	1
Military Personnel Command (MILPERSCOM)	0	1
Canadian Army (CA)	9	2
Canadian Operational Support Command (CANOSCOM)	4	0
Canadian Special Operations Forces Command (CANSOFCOM)	1	1
Royal Canadian Air Force (RCAF)	7	3
Royal Canadian Navy (RCN)	2	2
Total	**24**	**11**

Table 2 provides a snapshot of AESP health for the various L1 organizations by rolling up AESS results by base in accordance with the colour code detailed in the legend. Not only does this roll-up allow an initial analysis of results by L1, it also provides for the identification of trends by AESS element across all Commands.

Initial analysis of the results show positive results for ADM(S&T) and CANOSCOM. The CA has demonstrated some weaknesses in two of the AESP elements; however, corrective action plans should rectify the observations made. The two Commands which have exhibited the largest number of deficiencies were the RCAF and CANSOFCOM. In the case of CANSOFCOM, the results are based on one AESI of a unit with some long standing non-compliance issues which are in the process of being corrected. The corrective action plan developed by CANSOFCOM should rectify the noted deficiencies. In the case of the RCAF, corrective action plans received from this year's AESIs indicate that the issues are being addressed and expected to be resolved. The RCAF issues regarding disposal are principally related to Destruction Range licensing[4] and A&EI 11.[5] A change in Destruction Area policy rendered all RCAF Destruction Area licences expired resulting in an inability to conduct disposal operations. The RCAF is working with LFDTS/DAT to relicense RCAF Destruction Ranges as rapidly as possible. A&EI 11 qualification requirements regarding Munitions Scrap (MS) verification requirements cannot be met by most RCAF Wings resulting in accumulation of MS and range scrap as it cannot be processed for disposal. DAER is reviewing these qualification requirements with the RCAF.

TABLE 2 L1 AESP Health by AESS Element

	ELEMENT						
L1	SAFETY PROGRAM	STORAGE	MAINTENANCE OPERATIONS	TRANSPORT	DISPOSAL	EMERGENCY PREPAREDNESS	ADMINISTRATION
ADM(S&T)							
CA							
CANOSCOM							
CANSOFCOM							
RCAF							
RCN			N/A				

Legend
GREEN — 60% or more L1 AESIs score element green
YELLOW — Less than 60% L1 AESIs score element green and less than 20% score element red
RED — 20% or more of L1 AESIs score element red

[4] CANFORGEN 192/11 Managing Authority for CF/DND Destruction Areas 141451Z October 2011

[5] 11300-80 (DAER 2, RDIMS_OTT_LSTL-#2737103) A&EI 11 Disposal of Ammunition and Explosives at the End of Life Cycle - Change 01 dated 16 September 2011 Annex A Level of Inspection Qualification Matrix

The examination of Table 2 across all seven elements, points to some deficiencies across all Commands, notably in the areas of Safety Program, Storage and Administration. The following observations occurred at a rate of 30% or greater across all commands and require attention:

- Not displaying correct Fire Division and supplementary symbols;
- Not following Hazard Division, Net Explosive Quantity (NEQ), compatibility mixing and segregation, and special restriction requirements;
- Lack of timely materiel adjustment and expenditure reporting and not following inventory management procedures, most likely due to misunderstanding of Canadian Forces Supply Manual[6] (CFSM) mandated A&E inventory control requirements;
- Inadequate warehousing procedures appear to stem from unclear warehousing regulations. This issue is being clarified in the Storage and Facility Operations Manual[7] to be released summer/fall 2012;
- Lack of quarterly A&E Safety sub-committee meetings often due to the lack of established A&E Safety sub-committees. The root cause appears to be the gradual decline in AESP execution and the lack of inspection of this requirement in preceding decades;
- Lack of A&E safety appointments in statement of duties again as a result of the decline in AESP execution. This situation is exacerbated by a lack of trained Unit Ammunition Representatives and identified Unit Explosives Safety Officers; and
- Deteriorating A&E facility conditions, most often resulting from competition for limited infrastructure maintenance funding.

DAER staff accompanied L1 ATAs during L1 AESIs to 4 Wing Cold Lake, CFAD Bedford, DRDC-Suffield, CFB Shilo, CFB Halifax and MARLANT to assist and guide L1 ATAs performing inspections, as well as to receive and action feedback as quickly as possible. Base A&E specialists welcomed scored criteria as it allowed them to focus their efforts and Commanders seemed very receptive to receiving a score with defined criteria to allow them to gauge observations globally and tailor corrective action plans.

Avalanche Control Activities

Rogers Pass Avalanche control is governed by a Memorandum of Understanding (MOU) between the DND and Parks Canada Agency (Parks Canada). Canada Command (Canada COM) has the DND lead, with resources from Joint Task Force (Pacific) and Land Forces Western Area as part of Op PALACI. In the 2010/2011 season, DAER monitored artillery ammunition resupply and recommended reduced explosives storage limits and better management of unused propellant. The latter resulted in the revision of instructions governing the return[8] and destruction[9] of excess propellant. DAER intends to formalize the reduced explosives storage levels through the Natural Resources Canada (NRCan) explosives storage licence at its next renewal. DAER participated in the 2010/2011 After Action Review, provided input to the 2011/2012 Op Order, and assisted the AVCON Working Group in re-writing the MOU, due for signature in October 2012. While priority rests with the Rogers Pass AVCON activity, past non-DND activities elsewhere in British Columbia identified to use privately obtained military weapons and ammunition are also under consideration.

ADM(IE)'s UXO and Legacy Sites Program (UXO & LSP) completed a risk assessment of accumulation of UXO from AVCON activities and will consider a multi-year project for a one-time clean up of target impact areas in Rogers Pass. However, because Rogers Pass is not a legacy site, clearance activity there may revert to CF EOD with Canada COM resources responding to UXO finds. Parks Canada maintains a detailed dud log by date and target location and only four of 1291 rounds fired this season were reported as such. Each spring, Parks Canada personnel conduct sweeps for UXOs and call upon DND for destruction assistance. No UXOs were located or destroyed in 2011. After more than 50 years of this activity, Glacier National Park is estimated to contain 400 UXOs. UXO & LSP evaluated the UXO contamination risk in Glacier National Park and after considering the relevant factors evaluated that risk as Medium.[10] A mitigation plan was developed to further reduce the risk that included DND warning signage, continued visual sweeps, DND disposal of found UXO and enhanced Parks Canada staff safety briefings.

[6] A-LM-007-014/AG-001 Canadian Forces Supply Manual

[7] C-09-005-002/TS-000 Volume 2 — Storage and Facility Operations TBI

[8] 11300-1 (DAER 2, RDIMS LSTL-#2311654) A&EI 29 Packaging and Return of Surplus Gun Propellant and Mortar Increments dated 11 April 2011

[9] 11300-1 (DAER 2, RDIMS LSTL-#1927123) A&EI 31 Destruction by Open Burning of Surplus Propellant on Approved Burning Trays dated 17 August 2011

[10] UXO-FM-3180 (DRPM 2) Quality Management System, Record of Legacy Site Risk Management (RLSRM) Form dated 8 November 2011

National A&E Register of Storage Licences

In 2011, the initial five year renewal process for all 365 storage facility licences was completed bringing to a close a holistic review to ensure that DND/CF A&E facilities are properly licensed. In 2012, 53 licences will expire which will trigger the first round of re-licensing to ensure local conditions under which a facility was licensed have not changed. Monitoring of this issue will continue and a list of sites requiring re-licensing is provided in Table 3.

TABLE 3 Licensing Requirements by Command for 2012

COMMAND	BASE	NUMBER OF POTENTIAL EXPLOSIVE SITES (PES)
CANOSCOM	CFAD Dundurn	41
CANSOFCOM	DHTC	2
RCAF	4 Wing Cold Lake / CFS Alert	4
CA	CFB Gagetown	1
VCDS	CFSU(O)	4

Mission Transition in Afghanistan

The Afghanistan mission transition from combat operations to training resulted in the largest A&E reconstitution since the Korean War. Significant planning occurred prior to the Mission Transition Task Force (MTTF) deployment to Afghanistan. The Mission Materiel and Infrastructure Board (MMIB) planned and drafted the Materiel and Infrastructure Distribution Directive (MIDD)[11] released by Commander CEFCOM. A key element in the safe return of A&E stocks to Canada involved the implementation of a surveillance program to enable the Director Ammunition and Explosives Management and Engineering (DAEME) staff to make decisions regarding A&E condition that resulted in either repatriation or disposal in theatre. In June 2011, a team of one Ammunition Technical Officer (ATO) and 14 Ammunition Technicians (ATs) deployed to theatre and were responsible for all A&E receipt, conditioning, re-distribution, repatriation, and disposal.

Feedback from CANOSCOM /J4 personnel indicated the MIDD was not fully followed. For example, Unit Supply Customer Accounts (SCAs) were not zeroed and closed out prior to account holders returning to Canada in contravention of the CFSM.[12] Decisions to push significant stocks of A&E forward to the various Forward Operating Bases (FOBs) increased quantities held by fighting units over the course of the mission, and led to an accepted in-theatre practice of pre-expending A&E upon second line issue, which is not an accepted practice for A&E in the CFSM. This pre-expenditure over the entire mission was identified by the MMIB and requires a solution for future deployments. The MTTF Topic Lesson Report (TLR) 11-113 identified, "the compounding of this practice over 10 years of operations created a large issue for mission closure."[13] At the time of writing, processing of A&E reconstitution had begun with an estimated three months of work to complete.

The MTTF TLR 11-113 also requested changes to current A&E logistic disposal doctrine to authorize Combat Engineers to perform this activity. DAER will examine and provide recommendations on this issue with input from CF EOD, CME, CANOSCOM/J4 Ammunition and other stakeholders.

Inventory Control and Management

As a follow up to the Chief of Review Services "Audit of Inventory Management: Stocktaking, Adjustments and Write-Offs",[14] the 2010 DAER annual report highlighted issues related to control of the Department's A&E inventory emphasizing the use of the Ammunition Inventory Management System (AIMS) and submission of timely adjustment documents to support A&E usage. The DND Management Letter 2010–11 Public Accounts Audit[15] supported the DAER Compliance section findings. Corrective Action Plans received from both the CA[16] and RCAF[17] indicate that they will implement initiatives to make better use of AIMS to control A&E allocations and that their G4 and A4 Supply Staffs will be more vigilant during their Staff Inspection Visits (SIVs) to ensure that A&E accounting requirements are met, in particular regarding submission of adjustment transactions. DAER, DMPP and A&E stakeholders are in the process of amending the CFSM to better define A&E reporting and accounting requirements. As in the 2010 report, these two areas are still assessed as "Needs Improvement". This year, additional work was undertaken regarding AIMS and Adjustment Transactions.

[11] MIDD Annex MM Appendix 6, Table E-A&E Supply Procedures in Support of Mission Transition

[12] A-LM-007-014/AG-001 CFSM 3-29A-001 paragraph 7

[13] TLR 11-113 Ammunition Processing and Disposal dated 3 December 2011

[14] 7050-36 (CRS) CRS Audit of Inventory Management: Stocktaking Adjustments and Write-Offs.

[15] DND Management Letter indicated: Ammunition in Supply Customer Accounts (SCAs) — Write-offs not recorded on a timely basis and ammunition stock counts averaged 15% error rate in quantities across warehouses and SCAs visited.

[16] 11300-1 (Army G4 Ammunition) Ammunition Inventory Control and Accountability in the Army dated 06 February 2012

[17] 1 CAD HQ A4 Maint Arm Email dated 131836Z September 11

Air Weapons Systems Technicians from 425 Tactical Fighter Squadron Bagotville handle bombs and missiles before installing them on CF-188 Hornets, at Trepani, Italy, March 22, 2011.

AIMS. When introduced as the Corporate System of Record (SOR), the Materiel Information Management System (MIMS) did not incorporate the logistic and technical requirements to safely manage the A&E inventory, which necessitated development of AIMS. This situation resulted in the requirement to enter the data into each of the two systems separately to safely manage and account for A&E. A&E specialists have identified the double entry requirement as time consuming, a potential source of errors, and the cause of misconceptions regarding the information AIMS was designed to provide.[18]

The current MASIS Phase V project roll out is expected to be completed by December 2013 with data transition from MIMS to DRMIS to be finalized by end December 2013. The project has identified that incorporation of the full A&E data entry capability will not be available before that date and double entry of data will continue until the remainder of AIMS functionality can be incorporated. Development of this functionality will commence in early January 2014.

CANOSCOM/J4 Ammunition[19] is working with ADM(IM)/DMIS 8 to enhance AIMS to enable its adoption as the interim Corporate SOR providing a single entry system pending full DRMIS functionality.

Adjustment Transactions. While unit diligence regarding adjustment transaction certification procedures for A&E consumption improved, timely submission is still not occurring. This led to instances where the National Inventory Control Point (NICP) could not provide accurate inventory balances to support operations. There is also a lack of understanding of how A&E is held and reported once issued to the user. In some cases, units hold standing task operational stocks on the same account as the unit's training stock, resulting in further confusion when the NICP requests verification of unit holdings. While a joint ADM(Fin CS)/DFA and DAER endeavour attempted to gather unit/base CF 152 Reports of Write-Off of A&E deficiency and surplus data, this request proved very difficult for recipients to satisfy as Quarterly Reports of Write-Off only reported the dollar value and not what commodities were reported as surplus or deficient. Further investigation revealed A&E write-off action as a result of stocktaking deficiencies seems a normal occurrence, which is of significant concern considering A&E has some of the most stringent accounting requirements in the CFSM.

[18] Topic Lesson Report (TLR) 11-113 Ammunition Processing and Disposal dated 3 December 2011 stated the AIMS should have been able to provide totals for movement planning purposes, yet AIMS was never intended to be used for movement planning purposes. The TLR also states the AIMS does not track issued A&E and cannot attribute it to the various original receiving accounts, making accounting for ammunition in theatre very challenging. The AIMS does track by A&E lot number and quantity by natures of A&E issued to user units. A&E accounting is the responsibility of the Corporate SOR using a combination of issue, return, and adjustment transactions upon expenditure to determine current stock holdings.

[19] 4500-1 (Comd CMSG) Interim System of Record for A&E dated 06 October 2011

Initial Lessons Observed from Op MOBILE

Initial Op MOBILE lessons observed indicated A&E deployment processes supporting air operations require revision. The aircraft deployment occurred on very short notice with little time for Joint planning, making A&E requirements and scaling unclear and complicating amalgamation of initial A&E requirements and finalizing movement to theatre. Ultimately, the first Squadron assigned to the mission deployed using training/domestic operational support doctrine with a direct line of communication to their support base. Since A&E and NICP subject matter experts were not consulted in planning, a 100% verification of each A&E nature had to be conducted to ascertain location, serviceability, and status.

In theatre, three unit Supply Customer Accounts (SCAs) were opened and in some cases A&E were issued directly to them, resulting in significant NICP staff effort to determine actual theatre A&E stock levels as SCAs are not accessible to the NICP. While an A&E District Account (DA) was opened, no account holder was assigned to it, which resulted in further difficultly reconciling A&E stock levels. Additionally, when A&E were consumed in operations adjustment transactions were not submitted to remove the items from the inventory, further leaving the NICP unable to track theatre holdings. Despite specific instruction[20] being issued, the NICP was unable to forecast procurement requirements. Poor management of A&E inventory led to an initial stocktaking deficiency of approximately $2.5M. This value subsequently decreased following further investigation.

The lessons observed during Op MOBILE point to a need to review the inventory management system for RCAF A&E natures. While the RCAF has a significant role regarding proper configuration of RCAF A&E, it must follow inventory management procedures for control and management of A&E stocks earmarked for standing operational tasks vice training. Furthermore, it is imperative Force Generators (RCAF for Op MOBILE) and Force Employers (CEFCOM) are cognizant of lead times required to identify A&E scales, determine from where stocks will be drawn, and procure stocks.

A&E Compliance Update on Areas from 2010 Report

Human Resources Renewal

The ATO Occupation Specialty Qualification (OSQ) is under pressure from both the DND/CF requirements and limited training throughput in the United Kingdom (UK). Until 2012, DND/CF ATO training occurred on a 16-month UK course with a maximum of two candidates a year as of 2011. The ATO Training Needs Assessment[21] determined the DND/CF required a minimum of seven ATO graduates per year to support succession planning, a suitable ship-to-shore ratio and normal officer progression in the six classifications providing ATOs.

To alleviate the production shortfall, the ATO course is being repatriated to Canada. The first course was originally scheduled for January 2012; however, administrative challenges forced a delay. The inaugural serial is now scheduled to start September 2012 and conclude in July 2013 with a minimum of 12 candidates. It will consist of one semester at Royal Military College (RMC) and seven months of technical training at the Canadian Forces School of Administration and Logistics in Borden. Since the course will concentrate on and teach the DND/CF requirements and processes, an ATO completing it is expected to be more capable of working within the DND/CF system.

Division of L1 ATA Responsibilities

Currently, L1 ATA Responsibilities are fulfilled by A&E trained personnel for the RCN, CA, RCAF, CANSOFCOM and ADM(Mat) and each has a qualified ATO posted to a designated L1 ATA. The past 10 years of rapid CF transformation combined with limited ATO training throughput resulted in L1 ATA positions growing faster than they can be filled with skilled, experienced personnel. Consequently CANOSCOM/ J4 Ammunition is the CANOSCOM, CEFCOM, Canada COM, ADM(S&T), ADM(IE), MILPERSCOM, and VCDS Group L1 ATA. During 2010, J4 Ammunition expressed an inability to provide adequate support beyond CEFCOM, CANOSCOM and Canada COM due to their additional responsibilities for the NICP, CF Ammunition Depots Operations, and support to deployed operations.

[20] 11300-5A (NICP/Ammunition) Interim Joint Demand Procedure-Op MOBILE (NICP 01/11) dated 14 April 2011

[21] CDA HQ/DPD Ammunition Technical Officer (ATO) Needs Assessment Project dated 18 June 2007

Although these organizations do not all use A&E to the same degree, all require an L1 ATA with the requisite skills and expertise to develop and oversee an effective L1 AESP and provide Commanders with timely, accurate advice. DAER opened discussions with ADM(S&T), ADM(IE), MILPERSCOM, and VCDS Groups to explore how each could develop an integral L1 ATA capability and what could be done in the interim. Further discussions will take place while J4 Ammunition stands ready to provide urgent assistance so no organization is without support until this is resolved.

Safety and Suitability for Service

Safety and Suitability for Service (S3) Implementation. Work continued to address 32 observations made with respect to the S^3 policies and processes in 2009.[22] Of the 32 observations as of the time of this report 20 were closed. The following points are noteworthy:

- DAER completed C-09-005-007/TS-000 Certification of Ammunition, Explosives, and Accessories for Service Use (to be published early 2012). Concurrently, DAEME revised D-09-002-010/SG-000 Assessment of the Safety and Suitability for Service of Ammunition and Explosives, which is expected to be published late 2012;
- Identified training deficiencies are being resolved with DAEME completion of a Qualified Ammunition Technical Authority training package. A pilot course is scheduled for February 2012 and the package will also be incorporated into the QL6A AT, ATO and Advanced Ammunition Engineer courses;
- Lack of S^3 process awareness was addressed through the revision of DAEME's S^3 process briefing and its delivery to various organizations requiring cognizance. More specific information on A&E acquisition requirements was also incorporated into the VCDS Project Approval Directive and DAEME continues to work to embed S^3 processes in the ADM(Mat) MAT KNet on-line tool; and
- While the creation of a Lessons Learned database remained unaddressed, DAEME plans to complete its creation in 2012.

[22] 11300-1 (DAER 4-2, RDIMS LSTL #1601346) dated 25 November 2009

In-Service Surveillance Program

An in-service surveillance program (ISSP) is required to validate the serviceability of A&E stocks. DAEME analyzed data collected during the ISSP of stored Op ATHENA A&E to determine the serviceability and safety of stocks.[23] It was concluded degradation was minimal, with the only exception being 105mm white phosphorous tank ammunition, which had rapidly deteriorated due to low initial propellant stabilizer content, item age, and exposure to high temperatures resulting in re-crystallization of the projectile's white phosphorous.[24] This ammunition was therefore sentenced for disposal. As a precautionary measure, DAEME has also recommended all opened A&E stocks be reconditioned and issued first for training.

Realizing none existed; DAEME published and implemented an ISS Standard[25] in the fall of 2011. The implementation strategy is focused on both legacy A&E and new A&E procurement. All legacy ammunition will be subject to the new ISS standard, however many items will only require periodic inspection and high performance liquid chromatography (HPLC) testing to satisfy the new ISS standard. New ammunition acquired as part of the Tactical Armoured Patrol Vehicle (TAPV) has been selected to be the first to be evaluated using the new ISS standard. DAEME continues to work toward full implementation of the new ISS standard.

Demilitarization

Total A&E currently awaiting disposal is estimated to be 5,200 tonnes, of which 2,750 tonnes is munitions scrap (MS) (see Annex A, Table 1). Due to limited large scale commercial demilitarization capability in Canada, the DND/CF continues to rely principally on Open Burning/Open Detonation (OB/OD) to dispose of A&E at the end of their life cycle, with the remainder sold to other countries (see Annex A, Table 2).[26] End of life cycle A&E disposal changes were also incorporated to limit quantities and locations where OB and OD operations may be conducted.[27,28]

[23] 11300-104 ASSB Engineering Assessment 12-011, Surveillance of Ammunition in Task Force Afghanistan to be issued April 2012

[24] 11300-104 DAEME EIT Certificate of Surveillance 11-14 Propellant Stability Testing 2010 dated 16 February 2011 Annex A

[25] D-09-002-017SG-001 Standard In-Service Surveillance of Ammunition and Explosives dated 01 December 2010

[26] Email DAEME 6-2/DAER 4 241231Z February 12

[27] 11300-80 (DAER 2, RDIMS_OTT_LSTL-#2737103) A&EI 11 Disposal of Ammunition and Explosives at the End of Life Cycle — Change 01 dated 16 September 2011

[28] 1262-01 (DAER 2, RDIMS_OTT_LSTL-#2706572) dated 15 November 2011 Waiver — CFB Gagetown Increase to End of Life Cycle Destruction Limit

Disposal operations in 2011 demilitarized 138 tonnes of A&E related items, including 30 tonnes of live A&E. The remainder consisted of inert A&E, aids to production, outdated tools and equipment, and 107 tonnes of ammunition salvage (see Annex A, Table 3). The following major disposal operations are under consideration:

- Exercise ROLLING THUNDER II is scheduled to destroy an estimated 12 tonnes of A&E in 2012;
- Demilitarization of 12,600 DPICM rounds through PWGSC to comply with the United Nations Convention on Cluster Munitions (Oslo Convention). There have been significant delays with work initiated in 2007[29] and the contract has not yet been awarded. The Oslo Convention deadline for implementation is eight years following Government of Canada ratification, currently pending at this time;
- Disposal of approximately 85,000 CRV-7 Rockets will be by either DND/CF internal resources, external contractor or a combination of both. The major concern is the selection of a disposal method that minimizes the environmental impact; and
- Disposal of a further 1,400 tonnes from 2013 to 2015 using various approved methods.

Project C.00001101 CF Ammunition Demilitarization Capability, managed by CANOSCOM, will provide a singular demilitarization capability for obsolete and time expired A&E and MS. It is in the process of re-scoping[30] and will consist of the following phases:

- Phase I — addresses MS and small arms ammunition (SAA) disposal furnaces with CANOSCOM being responsible; and,
- Phase II — addresses pyrotechnics and most High Explosive natures not covered in Phase I of the project with ADM(Mat) being responsible.

Overall, the project has not progressed significantly in the past 12 months. SSID Amendment 4 is pending signature, the Project Director will continue to be CANOSCOM/J4 Amminition, and there is ongoing discussions between DAEME and CANOSCOM/J4 Ammunition regarding an equipment Project Manager.[31,32] The lack of progress was noted at the Fall 2011 Ammunition Board that then directed a solution be found within the next 12 months.[33]

Inert practice bombs brought back from the practice training area of 5 Wing Goose Bay and stored while awaiting demilitarization.

DND UXO and Legacy Sites Program

An update on work conducted by the UXO & LSP can be found at Annex B. While no compliance activities occurred on active legacy sites, there was refinement of processes used by civilian contractors employed by the DND/CF to perform UXO clearance activities. DAER engaged NRCan in an effort to recognize qualified civilian contractors as equivalent to DND/CF personnel for UXO disposal activities, which would negate the requirement for qualified DND/CF personnel at legacy sites during disposal operations. DAER is also better defining requirements for the movement of recovered UXOs from legacy sites using commercial means. The UXO & LSP and DAER continue to examine new technologies and continued progress to reduce reliance on CF EOD assets is expected.

In 2011 a new Canadian Standards Association standard for UXO divers was approved and the Divers Certification Board of Canada (DCBC) was accepted as the certifying organization for civilian UXO divers.[34] Holland College has developed a civilian UXO diver course that, when certified by the DCBC, will produce graduates able to work underwater on UXO legacy sites.

DAER is also working with NRCan to formalize delegation of UXO responsibilities in the areas of training, licensing, disposal, accident/incident reporting, and MS disposal.[35] Once formal delegation is received, DAER will provide DND/CF regulations to UXO contractors.

[29] CF1303 Disposal Certificate dated 27 January 07

[30] Draft Project C.001101 SSID Amendment 4 TBI date unspecified

[31] Telecon J4 Ammunition/DAER 4-4 17 January 2012

[32] Telecon DAEME 6/DAER 4 02 April 2012

[33] 1150-20 (DAER 4) Record of Decisions-Ammunition Board 12 October 2011, page 11, Item Fall 11-10

[34] 1000-1 (DAER4-3, OTT_LSTL RDIMS #2665531) Recognition of DCBC as Certifying Agency for Divers, Supervisors, and Tenders Employed in accordance with CSA Z275.6

[35] 1000-1 (DAER 4-3, OTT_LSTL RDIMS #2752625) Request for Amendment to the Delegation of Certain Powers by the Minister of Energy Mines and Resources Section 28-Explosives Act-Disposal of Abandoned, Deteriorated or Dangerous Explosives dated 30 June 1989, dated 6 January 2012

Transportation

When conducting training in the United States, federal regulations[36] are applicable when transporting DND/CF A&E by road using commercial assets. One of them is the requirement to have "EX" numbers assigned to the various A&E items. Those numbers are controlled by the United States Department of Transportation (US DoT). The assignment process has proven difficult in the past and efforts continued in 2011 to streamline the process. Initial discussions between the DND/CF stakeholders have identified a requirement to establish clear processes for the following:

- The departmental Competent Authority who interacts with the US DoT in accordance with regulations[37] requires review. While CANOSCOM/J4 Ammunition is currently identified as the authority, the process is in fact technical in nature;
- The EX number request process must put the onus for information acquisition on the user, their supporting ammunition facility, and their operational headquarters to ensure identification of the requirement during the operational planning process, not as an emergency requirement to support planned training;
- Once a requirement is validated, the requesting users L1 Advisor staff will be responsible to gather supporting technical data and forward it to the Competent Authority; and,
- Upon receipt of the EX number, the Competent Authority will ensure update action of the AIMS is initiated.

One of the results of the lack of a clear process for EX numbers has been the over utilization of military transport as a means to circumvent this requirement when A&E is transported to the United States.

A&E Infrastructure

The 2010 initial survey of A&E infrastructure observed the requirement to review A&E infrastructure investments and divestments holistically in light of ageing infrastructure across Canada. It also observed it was not possible to conduct coordinated centralized departmental A&E infrastructure planning since there was no established A&E distribution plan from depot to second line to guide such a review.

In response to these observations, ADM(IE)/DRPP agreed in principle there should be a centralized approach to the inspection, repair, and replacement of A&E infrastructure based on the principles used in the CF Master Realty Assets Development Plan.[38] The Ammunition Board has taken on the tasking of examining infrastructure and A&E distribution planning[39] to resolve the following:

- Establishment of approved holding levels by A&E nature and stock type at second and third line facilities;
- Adjustment of the NICP to reflect distribution;
- Rationalization of A&E infrastructure based on required holdings and transportation efficiencies between distribution points; and
- Production of an A&E realty asset development plan with DRPP.

Ammunition Program Governance

The 2010 Annual Report identified an opportunity for improvement with respect to Ammunition Program governance and strategic direction. Specifically, it was emphasized governance and strategic direction were a challenge due to the lack of a strategic level A&E organization, resulting in the need for cross L1 boundary negotiations for issue resolution.

To address this concern, DCOS ADM(Mat) directed a review of DND/CF Ammunition Program governance in collaboration with CANOSCOM[40] to:

- Examine the present A&E governance structure to identify specific areas of responsibility;
- Identify deficiencies or inefficiencies of the present organizational construct regarding accountabilities, process ownership, strategic functions and support to operations;
- Examine processes relating to National Procurement Management, NICP functions, operational support, life cycle management, inventory management, engineering and procurement; and
- Produce recommendations regarding organizational design for improving Ammunition Program governance.

[36] United States Code of Federal Regulations Title 49 (49 CFR)

[37] US DoT C7.18-Movement of Explosive Material by Commercial Conveyance

[38] Meeting ADM(IE)/DGRP/DRPP and DAER 231600Z August 2011

[39] 1120-50 (DAER 4) Record of Decision — Fall 2011 Ammunition Board 12 October 2011

[40] 11300-0 (DCOS (Mat) LSTL # 2741091) Review of DND/CF Ammunition Program Governance dated 19 December 2011

A&E Compliance Program of Work for 2012–2013

The program of work for 2012–2013 will again concentrate on follow up of past critical issues that continue to evolve. The only new compliance activities will be with ADM(IE) regarding UXO clearance on active ranges and the examination of A&E waivers for RCAF air sovereignty operations. The bulk of the work in the next two years will focus on the following:

- **AESP** — Continued monitoring of L1 AESP health including confirmation of action of corrective action plans from the 2011 results and analysis;
- **A&E Safety in Operations** — Review of the final report regarding the condition of Op ATHENA reconstituted A&E and tracking of both Op ATHENA and Op MOBILE Lessons Observed;
- **Inventory Control** — Continue to work with stakeholders to examine and address the root causes of the failure to submit timely Adjustment Transactions and A&E Stocktaking Deficiencies;
- **Avalanche Control (AVCON)** — Participate in the Parks Canada MOU renewal process to enhance A&E storage safety and continue working with the UXO & LSP to develop a UXO clearance plan for Rogers Pass/Glacier National Park;
- **Demilitarization** — With the need to dispose of stockpiled obsolete A&E and MS in an effective and environmentally responsible way, DAER will continue to ensure materiel does not become a safety hazard and Canada's obligations to international agreements for specific A&E items are met. DAER will also continue to follow the Demilitarization Capability Project development;
- **In-Service Surveillance** — Implementation of the new departmental ISSP will be monitored. Verification of legacy A&E ISSPs will continue and expand to include experimental and foreign A&E holdings; and,
- **Risk Assessment Processes** — Once the Ammunition and Explosives Risk Assessment Safety Case (AERASC) process is ensconced in DND/CF Policy, compliance verification activities will be undertaken regarding:
  - Air sovereignty operations ammunition storage waivers; and,
  - The UXO & LSP's Residual Legacy Site Risk Management (RLSRM) process.

Able Seaman Valerie Holden hoists ammunition to the hangar top during the Close-In Weapon System upload onboard a warship.

Summary

The 2011 compliance efforts resulted in findings of significance to commanders at all levels. Established metrics indicate a requirement to reinvigorate the DND/CF AESP. There is also evidence revealing challenges in A&E expenditure reporting, timely adjustment transactions, and inventory control and management. While efforts continue to progress the DND/CF demilitarization capability to reduce MS and obsolete A&E stockpiles, the division of responsibilities for capability development has slowed progress. Finally, both Op MOBILE and Op ATHENA saw many A&E related lessons observed that, for the success of future deployments, must become lessons learned or the potential will exist to repeat the same mistakes.

The DAER Compliance Program has provided the means by which the DND/CF can be assured that, although significant work is still required, the issues noted in the CRS report of 2005[41] have steadily improved and will continue to do so in the future.

[41] 1258-101-2 (CRS) Evaluation of DND/CF Ammunition Safety Program February 2005

Section 3

Ammunition and Explosives Policy Framework

Corporal Adam Saltzman, an Aviation Systems Technician with Task Force Iceland, straps a missile into position on a transport trailer in preparation for movement to the ammunition magazine at Keflavik Air Base, Iceland on 8 April 2011.

Introduction

Policy work in 2011 focused on the development of the main documents that will supersede C-09-153-001/TS-000 — *Ammunition and Explosives Safety Manual — Volume 1, Storage and Transportation* and on developing new and updating older DAODs. The need to provide policy in support of ongoing operations was particularly evident and considerable effort was placed on publications that address situations not covered by current policy, especially in the area of Risk Management. The use of Ammunition and Explosives Instructions (A&EIs) to provide timely distribution of critical information to the community continued to be a key tool.

The increasing focus on environmental standards is recognised within the A&E community and DAER is incorporating these requirements in the policy documents. Research into software tools that will allow characterization of A&E products[42] during demilitarization processing was a key aspect of this work.

[42] The term "products" refers to the chemicals produced when A&E is subjected to a demilitarization process.

A&E Policy Program of Work in 2011

The DAER A&E policy work in 2011 continued to focus on the updating of DAODs and with progressing the new A&E Safety Manual publication series. Many of the current A&EIs that have been published as interim policy documents will be superseded by the new volumes as they are published. With the addition of an environmental engineer on deployment from DGE to DAER, increased environmental scrutiny of A&E policy was carried out. Although Annex C provides the current policy status, an overview of policy development is highlighted below.

A&E DAOD Development

DAOD 3002-0 — Ammunition and Explosives. It contains the overarching departmental policy. The current version was published 10 November 2006 and work began on updating this document in 2011. Key changes to the DAOD will include clear definitions on ammunition stockpile categories, amendments to the authorities table and articulation of policy on converting the CF ammunition and explosives inventory to IM.

DAOD 3002-1 — Certification of Ammunition and Explosives and DAOD 3002-2 — Insensitive Munitions (IM). Both underwent stakeholder consultation and have been updated with the intent that they be published in 2012, following translation.

DAOD 3002-5 — Use of Firearms, Ammunition and Explosives. It is being rewritten to clarify approval authorities and responsibilities. In particular the authority for use of non-CF ammunition in CF weapons will be addressed.

DAOD 3002-7 — Ammunition and Explosives Risk Management for DND/CF. As previously reported, the A&E Program lacks a structured approach to managing risk throughout the entire A&E life cycle. The required keystone policy has been written and will be contained in C-09-005-001/TS-000 Volume 1 — Life Cycle Safety and a specific application of it for deployed operations will be contained in C-09-005-005/TS-000, Volume 5 — Deployed Operations. Coordination of this policy with L1 stakeholders has been the focus in 2011, including endorsement of assigned levels of authority for approving risk and concurrence with DAOD 3002-7 which will implement the policy.

Pending the administrative processing of Volume 1 and Volume 5, a requirement has been identified for CF deployed operations to utilize a risk-based process for A&E storage-related activities. The current consequence-based model that utilizes a waiver system overly restricts decisions by operational commanders. Consequently, a CANFORGEN is being processed that will authorize the use of a risk-based process in the interim.

C-09-005 Series Development

C-09-005-001/TS-000 — Program Management and Life Cycle Safety. The approved draft of Volume 1 of the A&E Safety Manual is with DSCO for pre-production/translation. Minor amendments and additions are now accumulating for insertion during the Technical Accuracy Check. This publication will act as placeholder for the latest Hazards from Electromagnetic Radiation to Ordnance (HERO) guidance until a dedicated volume (C-09-005-009/TS-000) captures expansion and further refinements on this topic, with QETE 4-6 as OPI. DAER continues to respond to HERO queries from the field, referring to QETE 4-6 for technical evaluations, and building a database of completed cases. A&EI 19 (Personnel Qualifications Matrix) has been incorporated and continues to evolve within Volume 1.

C-09-005-002/TS-000 — Storage and Facility Operations. The approved draft of Volume 2 is with DSCO for pre-production and translation. The lengthy process has put this publication behind schedule and it will now be issued at the same time as Volume 1.

C-09-005-003/TS-000 — Transportation. This volume was published 01 January 2011. With its release, the following other publications and policy directives were rescinded:

- C-09-011-002/AG-000 Duties and Responsibilities of the Service Representative Officer;
- A&EI 05 Transportation of Munitions Scrap; and
- A&EI 04 Transportation of Ammunition and Explosives Recovered during Domestic Explosives Ordnance Disposal Operations;

Work has already started on change 1 to incorporate stakeholder observations raised over the past 12 months.

C-09-005-005/TS-000 — Deployed Operations. Administrative processing delays resulted in this document not being published in 2011. However, much effort has been committed to NATO's equivalent publication Allied Ammunition Storage and Transportation Publication (AASTP-5) in the areas of: risk, appropriate wording for coordination of Multi-National operations, and new Field Distance Tables that will be incorporated in the Canadian publication.

C-09-005-007/TS-000 — Certification of Ammunition, Explosives and Accessories for Service Use. Work was finished on this volume and it is with DSCO awaiting publication.

C-09-008-002/FP-000 — Duds and Misfires Ammunition on CF Ranges and Training Areas. Work on the new version has been completed and the publication is currently in translation.

A&EI Development

A&EI 11 Disposal of Ammunition and Explosives at the End of Life Cycle. Change 1 of this instruction (formerly A&EI 11 Demilitarization) was published 16 September 2011 and amplified the existing policy direction in support of the A&E End of Life Cycle management as a whole, to enable the use of alternative methods instead of Open Burning and Open Detonation for disposal at end of life cycle. Change 1 was completed in close consultation with DGE/D Env P to ensure that the necessary environmental considerations were covered.

A&EI 29 Packaging and Return of Surplus Gun Propellant and Mortar Propellant Increments to Ammunition Facilities and A&EI 31 Destruction by Open Burning of Bulk Propellant, Mortar Increments and Artillery Charges on Approved Burning Trays. A&EI 29[43] Change 1 and A&EI 31[44] Change 1 deal with the transportation of surplus propellant from the training area back to the second line facility where disposal will take place. The updates to the A&EIs include new procedures along with the addition of new equipment to help in the disposal of surplus propellant in an environmentally friendlier manner, as well as in a safer manner. A&EI 29 also authorises different packaging which allows for the transportation of surplus propellant not only on DND controlled roads, but also on civilian roads.

A&EI 34 — Electrical Misfire Procedures. This A&EI was also released in 2011.[45] The current procedures detailed in C-09-008-001/FP-000 — Destruction of Surplus and Obsolete Ammunition were incorrect in many aspects. This publication is currently under rewrite, but to fill the gap an A&EI was released to ensure the correct procedures were known.

Miscellaneous Policy Development

Environmental Policy. The DND/CF is mandated to maintain military readiness through training while at the same time protecting the environment by complying with applicable environmental legislation, regulations and guidelines. It must therefore seek to strike a balance between these sometimes competing requirements including operations, training and activities associated with the employment and disposal of A&E.

This past year, DAER has continued to work with departmental stakeholders making significant progress identifying and developing methodologies to monitor environment compliance performance related to the disposal of energetic materials. DAER issued A&EI 31[46] on open burning (OB) of propellant. DAER also issued A&EI 11[47] on the disposal of ammunition and explosives at the end of life cycle. This instruction addressed the stakeholder responsibilities, destruction and disposal technologies that currently exist and the environmental regulations that must be observed when conducting end of life cycle disposal. It also provided location limitations where disposal is authorized and the annual disposal limits.

EOD Doctrine and Policy. C-IED TF and DAER continue to work on the new Intermediate Improvised Explosives/Home Made Explosives (IE/HME) training course. DRDC is playing a key role in the development of a training package in order to ensure that this training is as safe as possible for all members. Courses are scheduled to begin in 2012.

Unexploded Explosive Ordnance (UXO). The rewrite of C-09-008-002/FP-000 — Disposal of Dud and Misfired Ammunition on CF Ranges and Training Areas has been completed and is currently in translation with the aim of publishing in 2012. Work on C-09-008-003/FP-000 — Disposal of Stray Ammunition has reached the external stakeholder review stage.

A&E Related CANFORGENs. CANFORGEN 104/11[48] mandates the use of Canadian Forces Range Information System (CFRIS) for reporting all ammunition expenditures. Extensive consultation and work with DGE determined that the best way forward in calculating pollutant outputs is to ensure that all ammunition and explosives expenditures are recorded within the CFRIS database. The Canadian Army already uses CFRIS for this and the CANFORGEN requires RCN and RCAF to follow suit. The use of CFRIS throughout the Canadian Forces will give environmental officers the ability to query the database and check for pollutant outputs from their respective areas and across Canada.

CANFORGEN 192/11[49] passes the responsibility of licensing destruction areas in addition to demolition ranges to the Army as the Managing Authority (MA) and licensing authority. The transfer rationalises the MA and licensing authority for this activity along with demolition ranges under one L1.

International Policy. In the continuing effort to improve safety on operations, DAER worked extensively with the international community to further develop guidelines and standards. This included attendance at regular meetings of NATO's Conference of National Armaments Directors (CNAD) Ammunition Safety Group, bilateral meetings with US and Australian regulatory staffs, and attendance at the Australian

[43] 11300-1 (DAER 2, RDIMS LSTL #2311654) 11 April 2011 Ammunition and Explosive Instruction 29 (Change 1) Packaging and Return of Surplus Gun Propellant and Mortar Propellant Increments to Ammunition Facilities

[44] 11300-1 (DAER 2, RDIMS OTT_ LSTL # 1927123) 17 August 2011 Ammunition and Explosives Instruction 31 Change 1 — Destruction by Open Burning Of Bulk Propellant, Mortar Increments and Artillery Charges on Approved Burning Trays

[45] 11300-1 (DAER 2, RDIMS OTT_ LSTL # 2626203) 28 October 2011 Ammunition And Explosives Instruction 34 Approved Misfire Procedure for Electrically Initiated Disposal Operations

[46] 11300-1 (DAER 2, RDIMS OTT_LSTL # 1927123) A&EI 31 Change 1 — Destruction by Open Burning of Bulk Propellant, Mortar Increments and Artillery Charges on Approved Burning Trays dated 17 August 2011

[47] 11300-80 (DAER 2, RDIMS OTT_LSTL # 2477301) A&EI 11 Change 01 Disposal of Ammunition and Explosives at the End of Life Cycle dated 16 September 2011

[48] CANFORGEN 104/11 ADM MAT 001/11 131216Z JUN 11 Use Of Canadian Forces Range Information System (CFRIS) for Recording all Ammunition and Explosives (A and E) Expenditures

[49] CANFORGEN 192/11 ADM MAT 002/11 141451Z OCT 11 Managing Authority for CF/DND Destruction Areas

Members of Alpha troop from X Battery at Forward Operating Base Sperwan Ghar conduct a fire for effect mission.

international safety conference. Several papers were submitted and presentations made at international symposia aimed at producing standards available for use by all Nations on deployed operations and thereby reducing risk and enhancing effectiveness of combined and joint operations.

International partnerships in safety guidelines are also enhanced through membership and strong participation in the twelve nation Munitions Safety Information Analysis Centre (MSIAC). This year, MSIAC conducted a country visit to Canada which included information sessions at NDHQ and DRDC Valcartier.

Work continues in close partnership with the US DDESB, to complete a review of NATO doctrine, amend existing publications and develop new Allied Joint Publications (AJPs), to ensure that A&E safety issues are properly considered within NATO doctrine and uniformly applied on NATO Multinational operations. In conjunction with this, work continues on the review of CF joint doctrine to identify our own gaps and ensure that it is coordinated with NATO work.

Of particular note during 2011 was the promulgation of the UN's International Ammunition Technical Guidelines (IATG). DAER performed a key role in ensuring a coordinated approach with NATO guidelines and — through contact with Canada's Permanent Mission to the UN — will participate as a key Nation in the UN's roster of experts.

To align with allied HERO risk assessment development, DAER and QETE are working to adopt the US Joint Spectrum Center Ordnance E^3 Risk Assessment Database (JOERAD). This tool will permit a rapid risk assessment and determination of safe separations of sensitive ordnance items within the known E^3 environment of previously evaluated RF emitter suites, including those encountered in joint operations and with participating allied nations.

A&E Policy Program of Work for 2012–2013

DAOD Development

DAOD 3002-0 — Ammunition and Explosives. Its review will be completed in early 2012 and will incorporate changes to DND/CF structure and assigned authorities that may have occurred since the latest version was published in 2006.

DAOD 3002-1 — Certification of Ammunition and Explosives and DAOD 3002-2 — Insensitive Munitions. Both those DAODs will be published.

DAOD 3002-5 — Use of Firearms Ammunition and Explosives. DAER will complete external stakeholder review and translation.

DAOD 3002-7 — Ammunition and Explosives Risk Management for DND/CF. This DAOD will undergo final consultation with stakeholders and will be completed in 2012. This DAOD will implement new risk policy that will allow positive control and approval of higher risk activities, at the appropriate level. It will allow DAER to evaluate the CF/DND's level of risk in the annual report to the DM/CDS. A CANFORGEN and A&EI will be released to provide interim authority to implement a risk-based approval process for storage and storage related A&E activities in support of deployed operations. Pending development of a DAOD covering Risk Management for CF Ranges and Training Areas, the Canadian Army has published a CANFORGEN[50] identifying the Army Commander as the functional authority for range and field safety.

Development of C-09-005 Series Safety Manuals

C-09-005 Series. Work will continue to ensure that Volume 1 — Program Management and Life Cycle Safety, Volume 2 — Storage and Facility Operations, and Volume 5 — Deployed Operations are published in 2012.

C-09-005-008/TS-000 Volume 8 — Construction and Design Standards. DAER is co-author of the Construction Standards volume of the Explosives Safety Manual series. DCAE 4-8 has the lead and has started to prepare text. 2012 will see collaboration to confirm the contents and scope of the document. Draft A&EI 26 (Construction Guidance for Facility Electrical Systems) and draft A&EI 28 (Construction Guidance for Facility Heating Appliances) will be incorporated into Volume 8.

Electrical Standards. Following the example of other allied nations, DAER is exploring the relaxation of minimum electrical code standards employed for the safe storage of A&E. High standards will continue to apply to special-purpose A&E facilities, but guidance from the Mang Report[51] supports a more relaxed interpretation of the Canadian Electrical Code to provide acceptable safeguards for A&E storage. This relaxation may afford some construction and O&M cost savings, but will only be considered for the storage of service-packaged A&E.

Related to this topic is a thrust to de-restrict IT and electronic business devices needed to modernise the business of A&E maintenance. The challenge will be to select acceptable equipment and safe procedures to complement this change.

C-09-005-004/TS-000 - Demilitarization and Disposal will absorb the content currently promulgated in C-09-008-002 — Disposal of Surplus Obsolete and Deteriorated Ammunition with added guidance in demilitarization processes and disposal. It is expected that the publication will be out for stakeholder consultation in the latter part of 2012.

As part of the new publication process, annual reviews must be conducted on each publication. As such 2012 will see Change 1 to C-09-005-003/TS-000 — Transportation being released based on stakeholder comment and observations following its release.

Miscellaneous Policy Development

Environmental Policy. DND/CF holds in excess of 85,000 CRV-7 type rocket motors in ammunition facilities that require demilitarization, either by contracted means or in house. Work is currently underway to develop a policy which deals with the handling and transportation of asbestos known to be present in CRV-7 rocket motors. DAER will track the testing and assessment of CRV-7 rocket motors by DAEME and DRDC-V to characterize potential of ground contaminants and air emissions as well as other possible hazards arising from demilitarization.

In 2012, DAER will be issuing environmental and technical guidelines for the thermal treatment and destruction of A&E and MS based on the international, federal and provincial consultation completed in 2011. This will contribute significantly to the progress of the Demilitarization Project C001101.

To remain environmentally responsible during the conduct of demilitarization work, a tool capable of characterizing A&E during demilitarization processing is necessary. Research and consultation determined that the Munitions Analytical Compliance Suite (MACS) is the only tool powerful enough to characterize A&E during specific demilitarization processes. A case has been submitted for three MACS modules, namely "MACS-1 Demil", "MACS-2 Ranges" and "G-MACS Green Munitions". The MACS modules will provide the ability to populate CFRIS with much better information and facilitate highly accurate reporting under our National Pollutant Release Inventory (NPRI) obligations. Approximately 40% of the CF munitions are already characterized in the database used by the software.

[50] CANFORGEN 225/11 VCDS 037/11 231446Z DEC 11 Management Authority for DND/CF Range and Field Safety

[51] Electrical Requirements for the Department of National Defence Report, September 2007, Fred Mang Electrical/Consulting

An Air Weapons Technician from 425 Tactical Fighter Squadron, Bagotville assembles a laser-guided GBU-12 bomb in Trapani, Italy, on April 4, 2011.

MACS may replace AP-42[52] as it provides much more accurate data. It will feed NPRI[53] through CFRIS. To populate the DB to meet Canadian specific requirements, DAEME will provide CF munitions data and DAER will provide the relevant Canadian Federal and Provincial environmental regulations.

Unexploded Explosive Ordnance (UXO). DAER will continue to provide input to the development and technical accuracy of other publications such as the B-GL-381-001/TS-000 Training Safety manual and B-GL-381-003/TS-000 UXO and Range Clearance Handbook.

Demilitarization and Disposal. C-09-008-003/FP-000 — Disposal of Stray Ammunition has been updated and distributed for stakeholder review with a view to publishing in 2012. Consideration is being given to incorporating this document and C-09-008-002/FP-000 — Destruction of Duds and Misfires as parts of C-09-005-004/TS-000 — Demilitarization and Disposal.

Following the release of change 1 of A&EI 11— Disposal of Ammunition and Explosives at the End of Life Cycle, a new set of explosive labels has been developed which accurately characterize the status of A&E, including MS and ammunition salvage, throughout the demilitarization and disposal cycle. In the past the only label available, the Free From Explosives (FFE) label, was used broadly for purposes as diverse as identifying a bag of spent brass returned by a unit to certifying dummy and display ammunition. The policy direction in A&EI 11 means that continued use of a single label for a multitude of purposes is no longer practical nor considered safe. Draft labels have been circulated amongst the L1 stakeholders and final versions will be ready for publishing and distribution in early 2012.

The A-LM-007-014/TS-000 Canadian Forces Supply Manual (CFSM) is currently undergoing review at a number of levels. Most importantly is the requirement for the manual to reflect current policy and guidance based upon the operations on the ground. There are areas which require attention, such as in the area of the processing and disposal of Ammunition Salvage. DDSAL has recommended the manual be more generic in nature and to refrain from having it read like an SOP.

International A&E Doctrine. DAER will continue work to support a US initiative to conduct an analysis of NATO doctrine, amend existing publications and develop new Allied Joint Publications to ensure that A&E safety issues are properly considered within NATO doctrine.

CF A&E Doctrine. Nationally, DAER has conducted a review of CF joint and environmental doctrine to identify our own gaps and, in collaboration with CANOSCOM, will provide assistance in writing required doctrine ensuring that it is coordinated with NATO work.

A&E Terminology Standardization. The Defence Terminology Bank (DTB) is the authoritative source for all CF terms and definitions. As a member of the Defence Terminology Standardisation Board (DTSB), DAER will continue work on standardising A&E terminology in the DTB. DAER will also represent the A&E community as a member of the Joint Terminology Panel (JTP) and will establish an A&E Terminology Panel (AETP) with wide participation from departmental organizations specialising in A&E.

Summary

2011 was a watershed year in the development of A&E policy with many key documents published or nearing maturity and publication. Work in 2012 will see continued effort to push these documents through the publishing process and out to the A&E community. A process of ongoing review of existing documents will ensure that they are kept current.

The DAER mandate is to regulate the safety of A&E throughout the entire life cycle. The contributions of L1s and external stakeholders remain key to ensuring that the policy documents produced by DAER meet the needs of the CF/DND. We will continue to monitor all initiatives relating to CF A&E Safety, working with other organizations, both domestic and international, to maintain the drive to policy renewal.

[52] US EPA, AP 42, Fifth Edition Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, 1995

[53] Canada's legislated, publicly-accessible inventory of pollutant releases (to air, water and land), disposals and transfers for recycling, National Pollutant Release Inventory (NPRI) www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=4A577BB9-1

Section 4

Ammunition and Explosives Safety Advocacy and Analysis

CF-18s fire AIM-7s (air intercept missiles) during Exercise COMBAT ARCHER, which was held in Tyndall, Florida.

Introduction

Strengthening of DND/CF A&E Safety Advocacy and Analysis capabilities continued in earnest in 2011. In addition to the analysis of A&E accidents and incidents in support of the DAER Annual Report, the drafting of the new policy manual and the development of the Unit Ammunition Representative (UAR) and Unit Explosives Safety Officer (UESO) courses with the Standards Cell of the Explosives Training Cadre in CFSAL, the Advocacy and Analysis section completed and distributed DAER's second safety related movie, organized the annual conference and participated in the development of the latest e-solution tool for A&E safety management and reporting.

A&E Safety Advocacy and Analysis Program Activities for 2011

Policy

A-GG-040-006/AG-001 DND/CF Ammunition and Explosives Safety Program. This main AESP policy manual was last published in 1994 and was in dire need of modernization. In 2011, the first draft of the revised manual was produced in order to take into account the Canadian Standards Association CSA Z1000-06 Occupational Health and Safety Management standard, which was published in 2006. Use of the standard will ensure the "Duties of Employers" as listed in the Canada Labour Code Part II are respected. In fact, one of the duties is "adopt and implement prescribed safety codes and safety standards".

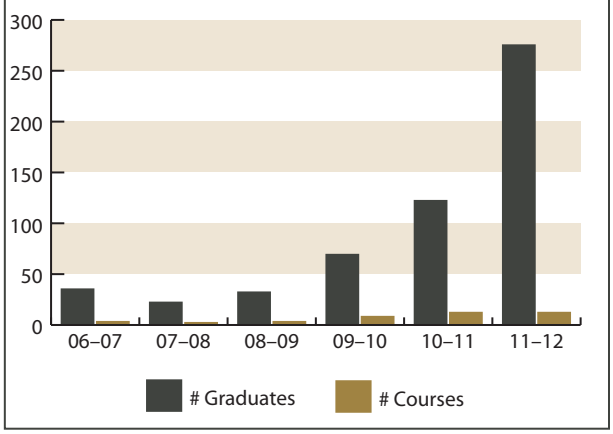
While the most significant change in the new manual will be the chapter on the adaptation of the CSA standard to the AESP, the other chapters will also include updates to the

legal aspects of the program, situate the AESP within the context of the DND/CF health and safety programs and clearly identify responsibilities at all levels. The manual is more detailed than the original version, and will facilitate the work of all involved.

Development of Courses

Unit Ammunition Representative (UAR) Course. The development of the Distance Learning (DL) version of the course continued during the whole year, however due to contractor delays, the DL package was not released as anticipated in 2011. In the interim, 275 individuals received classroom training at CFSAL. Although this is the highest number ever, training throughput still falls short of the DND/CF annual requirement estimated to be 400. Figure 1 shows the number of UAR courses and graduates since 2006.

FIGURE 1 Number of Graduates from UAR Courses

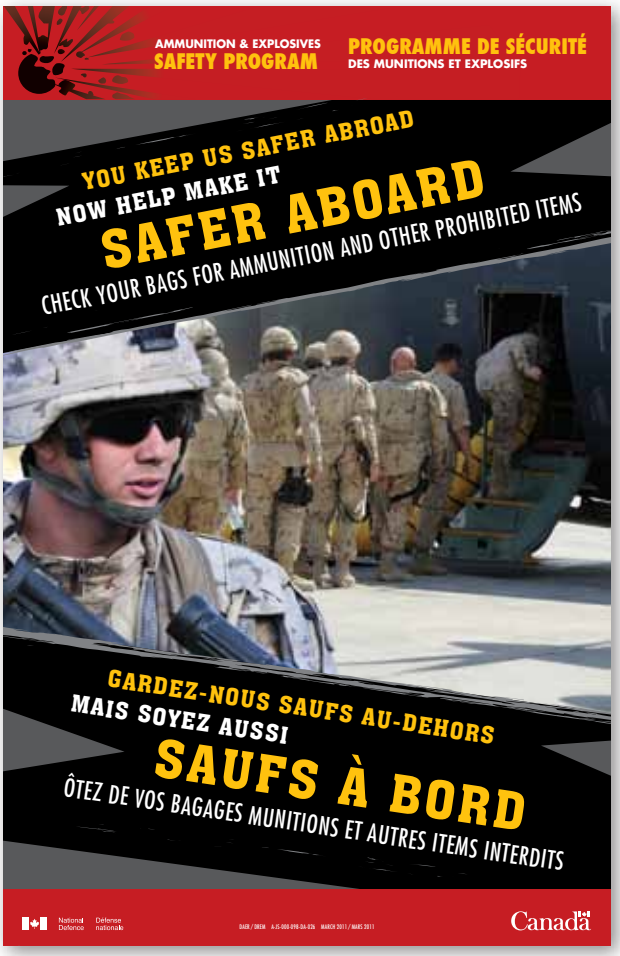


Unit Explosives Safety Officer (UESO) Course. The only development for this course was the completion of the Quality Standard and Training Plan Boards. The UESO course has never been intended to be delivered in a classroom format, but rather planned as a DL package following the completion of the UAR course.

Educational and Promotional Products

Poster. One poster was published in 2011, see Figure 2. Following a number of occurrences relating to A&E being inappropriately carried aboard aircraft, emphasis has been placed on the need for proper pre-boarding checks.

FIGURE 2 New Poster About Safety Aboard Aircraft Issued in 2011



DVD. A second DVD was finalized and distributed. This 30 minute safety video about the proper use of the main pyrotechnics devices used in the field is designed to facilitate the training of new users, as well as a refresher for previously trained members. It was developed in concert with the Combat Training Centre of Gagetown.

Promotional Items. Due to difficulties with contracting support, no promotional items were ordered in 2011.

Communications

General. Theme 7 of the CRS 2005 evaluation of the DND/CF Ammunition Safety Program[54] was Communications. One of the recommendations related to the theme was to "Establish mechanisms to promote dialogue and information sharing across DND/CF ammunition safety community and with key external organizations". The following paragraphs summarize the latest efforts to continue enhancing communications for the ammunition program at large, and the issues faced by the community.

DAER DIN Page. The DAER DIN page has become a reference for many members of the ammunition community. While many new outreach products have been added, communications through the DIN page have been hampered due to the loss of direct links to CFTOs. These were removed as a result of software changes in 2010 at the CFPD, as well as restrictions imposed by the application of Controlled Goods (CG) regulations. The end result is a more restrictive access to A&E publications, which may have an impact on safety if not properly managed; refer to the paragraph on CG regulations below.

DAER Shared Workspace. This shared workspace provides a virtual working group for on-line users for such efforts as file transfer or draft policy release for review.

Ammunition and Explosives Safety Conference (AESC). Over 120 people attended the AESC, a two-day conference that provided updates on a variety of topics. A third day was dedicated to one-on-one discussions on issues pertaining to the three services. This annual meeting has become an excellent venue to exchange ideas and distribute safety related information at all levels.

Impact of CG Regulations on Dissemination of Information. The application of CG regulations will require close scrutiny to ensure that A&E safety is not compromised due to the unavailability of safety critical information to A&E practitioners. In the past year, DAER has worked with stakeholders to identify solutions which will meet CG regulations while ensuring availability of required information to those that require it. Specific areas which require close monitoring include:

- **Availability of Publications.** The removal of A&E publications from the Canadian Forces Publications Depot (CFPD) Library affected user ability to access the required safety publications in a timely fashion. This has proven to be a challenge specifically for DAEME sponsored CFTOs. Meetings were held with DAEME and Controlled Technology Access and Transfer (CTAT) personnel in an effort to better define which publications should be restricted and how to maximize access to the greatest extent possible; and
- **Requirement for Level II Security Clearance.** When training involves access to publications with CG information, a level II security clearance is now required. This will have an impact on future course loadings for UAR courses and will affect some of the trade specific training relating to A&E. This will be monitored for impact on training delivery in 2012.

Electronic Tools

A&E Safety Information Management System (AESIMS)
The year 2011 saw a major development with respect to the development of electronic tools for the AESP with project decisions being made concerning AESIMS. With Mat Group sponsorship, the AESIMS requirement was reviewed by ADM(IM) as one of the top priorities for a safety program.

Safety Information Management System. Director Materiel Information System (DMIS) has offered to develop part of the original AESIMS requirements into an initial capability, coupled with the Flight Safety Occurrence Management System (FSOMS) upgrade requirement. The resulting software will be called Safety Information Management System (SIMS) and will cover the following requirements from AESIMS:

- Occurrence Reporting;
- Defects and Malfunctions Reporting;
- Ammunition and Explosives Safety Inspections and Surveys;
- Ammunition and Explosives Licensing and Storage, including waivers; and
- Risk Management.

A project charter was agreed to by the various directors involved and the revised business process mapping was completed during the last week of December 2011.

While this does not resolve all issues related to providing timely information to the decision makers, it represents a major step in the right direction. It is expected that initial capability will be delivered in the summer or fall of 2013.

[54] 1258-101-2 (CRS) Evaluation of DND/CF Ammunition Safety Program, February 2005

Summary of 2011 Accident and Incident Analysis

Statistics

A detailed analysis for 2011 is attached as Annex D. Along with the analysis is a summary of accidents and incidents, which is intended to promote dialogue down to the unit level and to illustrate the potential seriousness of any incident or accident involving A&E.

Figure 3 and Figure 4 provide a trend analysis for reported occurrences (accidents and incidents) and deaths and injuries during the past ten years. The dotted line indicates the creation of DAER, which constituted a major process change for the reporting of A&E occurrences.

Analysis

Based on the historical averages and the detailed analysis at Annex D, the following points are worthy of note:

- In the vast majority of reported cases, the ammunition or explosives worked as designed. There were two injuries due to ammunition faults: a member was injured when a parachute flare misfired and struck him; and another member was injured when the rocket motor of the M72 LAW that he was firing ruptured;
- Common User natures — those most frequently used and most familiar to CF personnel — continue to be involved in a high percentage of incidents and accidents;
- Most events are the result of human error (83% — which is up from 72% in the previous year); and

FIGURE 3 Occurrences 2002–2011

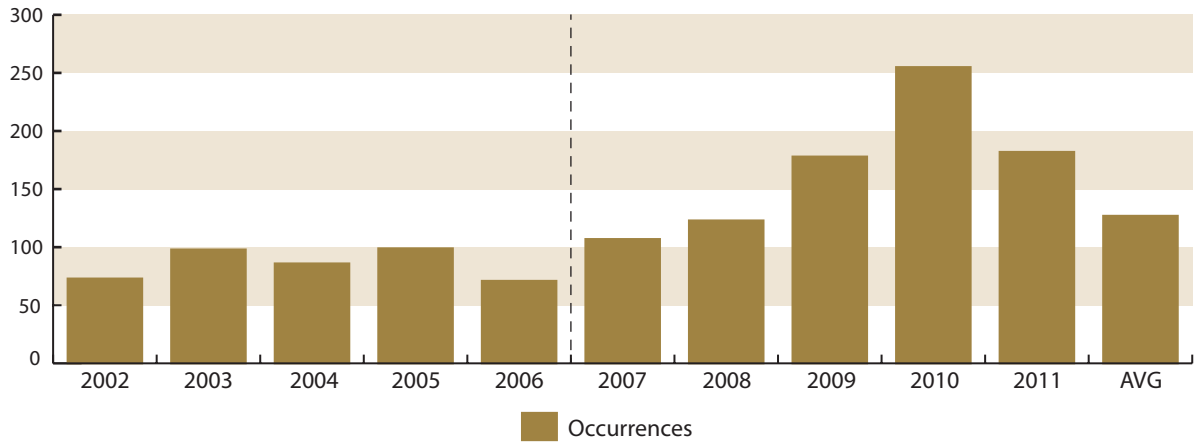
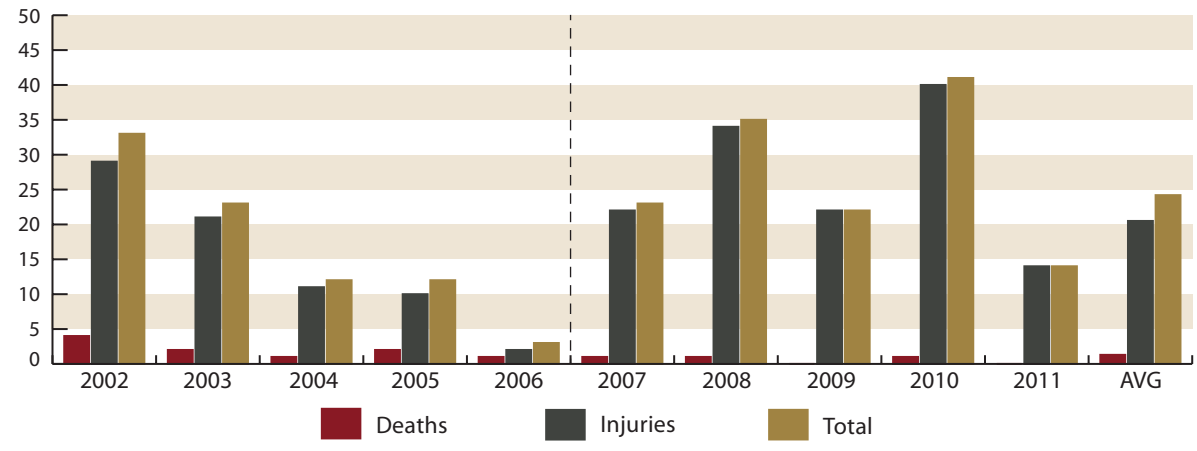


FIGURE 4 Deaths and Injuries 2002–2011



- Deliberate deviations from procedures caused 15 % of occurrences (comparable to 2010), including three injuries. A total of 23 out of 29 occurred within Canadian Army (CA) units, with a further three in CEFCOM Land units.[55] The relatively large number of accidents and incidents categorized as deliberate deviations, and the nature thereof, tend to suggest that there is a need to re-emphasize established drills and procedures using AESPs within some Land Force units.

Observations

Reporting of accidents and incidents, more specifically the lack thereof, continues to be a major concern, both during Force Generation and Force Employment. There is concern that many occurrences continue to go unreported within CA, CMP, CEFCOM and CANSOFCOM units. In general, this concern is based on the high usage of ammunition versus the low incidence of reporting and a comparison of accident/incident frequency.

Within RCN and RCAF, reporting appears to be a matter of routine. There is a need to address accident and incident reporting within CA and CEFCOM. Further, CEFCOM lacks an active A&E Safety Program and a dedicated Level 1 Ammunition Technical Authority (L1 ATA).[56] Robust out-reach/education programs should be pursued within both CA and CEFCOM in order to increase individual and unit awareness of ammunition and explosives safety.

Summary of 2011 Accidental Discharges

Statistics

This is the first year accidental discharges are reported separately from other incidents. This is the result of the A&E Instruction 30 published in August of 2010, and amended in December of the same year. The decision to report accidental discharges separately was made in order to avoid skewing the numbers, when comparing incidents from year to year.

In 2011, DAER received a total of 66 Accidental Small Arm Weapon Discharge Reports. They were divided into three main groups:

- Pistols: 5 occurrences, or 7.57%;
- Rifles/Carbines: 54 occurrences, or 81.82%; and
- Machine Guns (MG): 7 occurrences, or 10.61%.

During the same period, a total of 440 CF members were prosecuted under the military justice system and found guilty of unauthorized discharges.[57] Of those, 91 occurred on operations. The marked discrepancy between the 440 prosecutions and the 66 incidents reported to DAER indicates that further work is required by the L1s to reinforce the need to report all A&E related incidents and accidents.

Analysis

The causes of the 66 incidents that were reported to DAER were subdivided into 2 groups: human error and weapon malfunction. The fact 94% of all discharges were the result of human error is not surprising per se, as CF small arm weapons employ a mature technology, but the 6% attributed to weapon malfunctions appears high. Unfortunately, there are not enough reports to complete a full analysis; the numbers are too small and results would not be statistically valid.

Observations

The major observation resulting from reviewing the various reports is that in the majority of cases, weapon handling drills were not followed. The theory and the Tests of Elementary Training (TOETs) are given, but some members fail when it comes time to apply the theory. When compared to the millions of cartridges fired over a single fiscal year, by tens of thousands of different firers, the fact there are so few accidental discharges reported and so few people found guilty of negligent discharges seem to indicate that the training provided and related TOETs are adequate.

Greater effort should be made to promote the use of Accidental Small Arm Weapon Discharge Reports. Unit Explosives Safety Officers must promote their use and remind members this tool has been established to protect them, by allowing the discovery of patterns which could be the result of inappropriate training.

The fact the training and TOETs in place for those weapons presently in service appear adequate is something to build on in the coming years. However, when new small arm weapons will be introduced into service, it will be important to establish comparisons with those they replaced. This will only be possible if units are in the habit of reporting.

[55] One Deliberate Deviation occurred in CANOSCOM and two in RCN

[56] CEFCOM presently receives L1 ATA support from CANOSCOM/J4 Ammunition

[57] Number provided by the Office of the Judge Advocate General

Before leaving on a mission, Lieutenant-Colonel Sylvain Ménard, Commander 425 Tactical Fighter Squadron (425 Tac F Sqn) Bagotville, inspects a CF-188 Hornet fighter, at Trapani, Italy, on 20 April 2011.

A&E Safety Advocacy and Analysis Program of Work for 2012–2013

Policy

A-GG-040-006/AG-001 DND/CF Ammunition and Explosives Safety Program. Once the comments and revisions resulting from the internal DAER review of the first draft are complete, a second draft version will be distributed for review by Level 1 ATAs and their subordinate formations and units. This publication should be finalized in 2012.

A-GG-040-006/AG-002 DND/CF Ammunition and Explosives Accident / Incident / Defect / Malfunction Reporting. As a result of the AESP policy manual rewrite, a revision of the reporting manual will be initiated. As the latest version was published in 2008, the changes will be relatively limited and minor in scope. The aim will be to incorporate the latest changes, such as the new reporting procedures for accidental discharges, but also to facilitate the identification of causes, which will facilitate the analyses performed at all levels.

DAODs 3002-3 and 3002-4. Following the revision of the reporting manual, both these DAODs will be rewritten to conform to the new DAOD writing guidelines.

Development of Courses

DAER 3 will continue to support CFSAL in developing the DL version of the Unit Ammunition Representative (UAR) Course and the completely new Unit Explosives Safety Officer (UESO) Course, also for DL delivery. Both are now forecasted for implementation in late 2012. DL delivery of the UAR Course will significantly reduce the cost of UAR training while concurrently solving the throughput problem.

The new UESO Course presents a very strong lever to shift the explosives safety paradigm. This will provide Commanding Officers and Commanders the technical expertise within the organizations to address deficiencies.

Educational and Promotional Products

Posters. At least one new poster will be developed per year, with additional ones as needed to address specific issues.

Promotional Items. DAER will continue to pursue the procurement and distribution of promotional items. New levels of authority being delegated to Directors will facilitate procurement direct from trade.

Communication

Controlled Goods. It is hoped the issues plaguing users in relation to CG will be resolved in a satisfactory manner for all involved. Procedures need to be developed to ensure timely access of A&E publications to the practitioners, while respecting CG Regulations.

DAER DIN Site. The DAER DIN site is at a stage where most of the time is spent revising and updating content, rather than creating it. The DAER DIN site is now a resource site for UAR personnel and also supports training of UAR candidates. It will play an even more significant function for UESO personnel once Distance Learning training begins, as the information posted on the site has a direct application to UESO duties and responsibilities.

DAER Shared Workspace. The Shared Workspace is receiving increased usage. Its main function is for the review of documents and to upload/download files that cannot be sent by email. DAER 3 will continue to post information of interest to members of the community on a regular basis.

Other Sites. While the intent is to develop both a DAER Internet site and a DAER secure site on a classified network, the resources are not available at the moment. Once work on SIMS is completed (estimated in 2013), the development of those other sites will be investigated further.

Conference. The intent is to continue organizing one major conference per year for the entire Ammunition Community. For the year 2012, extra efforts will be directed towards attracting members from the EOD, clearance divers and combat engineering communities, as they have had the lowest attendance numbers at previous conferences.

Recognition Program. The Ammunition Community at the moment does not have an official Recognition Program to recognize the most deserving of its members. Creating one worthy of the name, with appropriate awards, managed and funded centrally by DAER, will resolve this issue.

Quarterly Bulletin. The intent is to create a bulletin that will cover topics of interest to the ammunition program. Initial roll out will consist of electronic distribution on the DAER DIN with the possibility of producing a printed version at a later date. DAER 3 has received the required software to produce the bulletin, and training will be provided to one member of the staff in 2012.

Electronic Tools

General. The bulk of the work in 2012 and 2013 will concentrate on the fielding of SIMS. Follow-on development work for AESIMS part II will be dependent on ammunition related Defence Resource Management Information System (DRMIS) decisions and will require business process mapping in the following areas:

- **Management of Stocks.** This is the basic management of stocks functions, with some enhancements specific to the ammunition community, such as the NEQ calculations and compatibility. Potentially, the Ammunition Inventory Management System (AIMS), which is maintained by DMIS, could be incorporated into AESIMS as a specific module, until DRMIS incorporates A&E. Accesses and user rights to AIMS would still be controlled by J4 Ammunition;
- **Operational Requirements Forecasting.** To allow staffs at various levels to identify the different natures they need and ensure there are sufficient stocks for planned operations or activities;
- **Procurement.** To replace the software called Ammunition Materiel Management System (AMMS) and assist the LCMMs perform their functions;
- **Data Collection.** A query tool to extract information from the various modules;
- **Data Library.** A collection of various documents, like CFTOs, NGRAIN training products, etc.; and
- **Training Tools.** For all the modules.

Summary

Overall, work to develop the Ammunition and Explosives Safety Program continued unabated in 2011. Important policy re-work is well underway, tools continue to be developed for the A&E practitioner and data analysis of A&E occurrences is starting to indicate which areas need to be worked on in order to improve safety. Efforts will continue to reinforce the requirement to report A&E occurrences in order to improve trend analysis as an important part of A&E safety. There have been some limitations on access to A&E related publications due to the Controlled Goods Regulations; discussion with the CTAT office needs to continue to ensure personnel can access the required information in a timely fashion. Finally, the creation of the SIMS project for electronic tools for the AESP is a concrete step forward that will deliver a solution in the 2013 timeframe. The part II requirements will now need to be examined in light of longer term decisions, for either the full incorporation of ammunition requirements in DRMIS, or the development of other solutions similar to SIMS for those requirements not taken over by DRMIS.

Section 5
Conclusion

After acquiring his target, a Canadian sniper fires the .50 calibre sniper rifle during Exercise TIREUR ACCOMPLI.

Building on the 2010 report, the Treasury Board Management Accountability Framework (MAF) has been used again, in an effort to continue gauging Departmental performance in meeting the obligations of its exemption from the Explosives Act. The same five assessment elements as last year were used as listed in Table 4. This will allow the continued identification of present strengths and weaknesses of the DND/CF ammunition program from a regulatory and safety perspective.

TABLE 4 Assessment Elements Descriptions

ASSESMENT ELEMENT	DESCRIPTION
Governance and Strategic Direction	Internal coherence, corporate discipline and alignment to outcomes are in place in order to provide strategic direction and support to DND/CF for the ammunition program
Policy and Programs	Development of policy and program tools are sustained in order to provide appropriate advice and guidance to the L1s
People	DND/CF has the required A&E specialists, work environment and focus on building capacity and leadership for the future
Risk Management	Risk Management activities in the A&E life cycle are governed by an overarching policy, risk decisions are assigned at the appropriate level and are tracked
Stewardship	Departmental Control Regime (assets, money, people, and services) is integrated and effective. Underlying principles are clear and contribute to the accomplishment of an effective A&E regulatory regime

Each assessment element was then rated against the MAF assessment scale, predominantly based on qualitative assessment from observations in the annual reports as described below:

- **Attention Required:** significant deficiencies — inadequate attention being paid;
- **Opportunity for Improvement:** moderate deficiencies — evidence of attention to the deficiencies and progress;
- **Acceptable:** no significant deficiencies — meets the requirements of the DND/CF A&E regulatory framework;
- **Strong:** no deficiencies in any of the measures — exceeds requirement of the DND/CF A&E regulatory framework.

Although there has been progress on a number of the recommendations from the 2010 report, the DAER rating for all assessment elements remains as 'opportunity for improvement' as more time will be required to progress the various corrective actions. The progress of the various initiatives are captured below by assessment element and are rated as either GREEN (satisfactory action is being taken to address the deficiency); YELLOW (action is being taken, however additional resources are required); or RED (no action being taken). Reference to the applicable annual reports is noted in the table as well as new areas addressed in this annual report.

12e Régiment Blindé du Canada Squadron "C" tankers turn in their unused ammunition to Master Corporal Marc Murphy and Trooper Jean-Michaël Lévesque upon their arrival at Kandahar Airfield.

Assessment Element #1 – Governance and Strategic Direction

Overall Rating: "Opportunity for Improvement"

REQUIRED ACTION	ANNUAL REPORT	STATUS	COMMENTS
Assignment of A&E expertise at a senior level in an ammunition strategic function	2010		DCOS (Mat) led initiative to examine ammunition strategic governance options. Recommendations to be presented to ADM(Mat) and Comd CANOSCOM in 2012.
Review of DAOD 3002-0 Functional Authorities	2010		DAER led review of DAOD 3002-0. Planned for release in 2012.
Accountabilities of the Ammunition Board	2010		This point is being examined under the Strategic Governance review.

Assessment Element #2 – Policy and Programs

Overall Rating: "Opportunity for Improvement"

REQUIRED ACTION	ANNUAL REPORT	STATUS	COMMENTS
Restructure of policy framework into new series of A&E manuals	2010 2009 2008		DAER policy update project is on track for completion in 2013–2014.
Implementation of new Program Tools: A&E Safety Surveys and Inspections (AESS and AESI)	2010		Roll-out of the AESS and AESI for evaluation A&E Safety compliance for Bases and Commands. First round of results in the 2011 Annual Report.
Implementation of improvements for Safety and Suitability for Service assessments	2010 2009		Planned improvements in the corrective action plan are on track.
Review of doctrine for logistic disposal of A&E in Theatre	2011		Initial meeting with all stakeholders co-chaired by DAER and CF EOD. New definitions and doctrine to be published in 2012.
Implementation of new In-Service Surveillance Program (ISSP)	2011		Policy published by DAEME with implementation in 2012–2013.
Assignment of EX numbers for A&E Transportation to US	2011		Process needs to be further mapped out for stakeholder agreement. In the interim, over-reliance on military transport for shipping A&E to the US.
Development of Unit Ammunition Rep (UAR) and Unit Explosive Safety Officer (UESO) Distance Learning Courses.	2010 2009 2008		Delays due to contract support. Slippage for both the UAR and UESO courses by approximately 12 months. Continued classroom delivery of the UAR with increased numbers to mitigate.
Further development of Ammunition and Explosives Safety Information Management System (AESIMS)	2010 2009 2008		ADM(IM) sponsored project for the Safety Information Management System (SIMS) to meet combined flight safety and A&E safety reporting requirements. Initial Capability planned for 2013. Status remains yellow as only some elements of AESIMS will be addressed.

Assessment Element #3 – People

Overall Rating: "Opportunity for Improvement"

REQUIRED ACTION	ANNUAL REPORT	STATUS	COMMENTS
Transition of the Advanced Ammunition Engineering post graduate program from SLA to a fully funded program	2010		The program is now fully funded. Hiring of professors must be finalized.
Stabilization of the Ammunition Technician trade	2010		Although the Ammunition Technician Trade remains yellow, the Strategic Intake Plan aims to address present deficiencies by 2014.
Re-introduction of the Air Weapons System Technician in the RCAF	2010		The first QL 3 course was completed in Oct 2011 with 12 graduates being posted to RCAF Wings. On track.
Development of Civilian A&E practitioners under the Civilian Ammunition Technician (CAT) program	2010 2009		Prior Learning Assessment Reviews completed for CA and CANOSCOM. Lesson plans completed for CATs 1 -3. Program is on track.
Provision of L1 Ammunition Technical Authority (ATA) Support	2011		Provision of ATA support to all L1 organizations which use A&E.
Create an environment which will contribute to a culture of reporting of A&E occurrences	2011		This has been an ongoing theme since the first annual report and requires renewed efforts on education and promotion and Chain of Command Involvement.
Implementation of Ammunition Technical Officer (ATO) training in Canada with selection of career management processes in place.	2010		DCOS (Mat) / Log Branch Integrator led project to establish a Canadian ATO course. Despite important progress in the past year, the planned first course start date was delayed by six months. File selection and career management both require further improvement.

Assessment Element #4 – Risk Management

Overall Rating: "Opportunity for Improvement"

REQUIRED ACTION	ANNUAL REPORT	STATUS	COMMENTS
Confirmation of assigned level of approval authorities for high and very high risk activities	2010		Legal confirmation received. Approval levels have been agreed to.
Further consultation for determination of A&E activities which will fall within the framework and alignment of present processes	2010		Consultation completed. Scope of activities has been finalized and will be included in DAOD 3002-7. Initial work has begun. CANFORGEN and A&EI will be issued in first quarter of 2012 as interim policy for deployed operations. Six month delay due to requirement for prolonged stakeholder consultation.
Review of RCAF Designated Areas (DA) for loaded aircraft utilizing a risk based approach	2011		Requirement to review all existing DAs in support of Air Sovereignty Operations utilizing a risk based approval process for non-compliant situations.

Assessment Element #5 – Stewardship

Overall Rating: "Opportunity for Improvement"

REQUIRED ACTION	ANNUAL REPORT	STATUS	COMMENTS
MOU on Avalanche Control with Parks Canada — adherence to safety and regulatory requirements	2010		Issues have been identified and need to be incorporated into the revised MOU with Parks Canada. Licence limits for storage require amendment by NRCan for required reductions.
Continued progress by ADM(IE) in addressing UXO legacy sites	2010		Solid progress of clean up of sites in accordance with the established priorities. New site requirements continue to challenge the ability of the program to execute.
Progressing the demilitarization initiative to provide a capability for DND/CF	2010 2009		Project continues to be re-scoped. SSID amendment 4 is pending signature. Ammunition Board expressed concern on lack of project progress. Options for Munitions Supply Program involvement for specific cases are being examined.
Continued environmental stewardship through application of A&E regulation	2010		Deployment of Environmental Engineer from DGE to DAER has allowed significant progress. Review of Open Burning and Open Detonation practices with enhanced environmental control. Linkages between NRPI reporting and CFRIS. Development of stack emission limits for demilitarization. Yellow status due to delay by PWGSC for the acquisition of prediction tools from the US.
Inventory Control / Accounting Deficiencies	2010		Deficiencies for inventory control continue to be exhibited at a higher than accepted rate both domestically and in operations. Need for dual entry of stocks in AIMS and MIMS will not be resolved in DRIMS for the foreseeable future. Number of occurrences involving self contained weapons is of concern.
A&E Infrastructure Realty Asset Development Planning	2010		Issue has been raised to the Ammunition Board however there has no progress to date in advancing this issue.

Summary

The overall status of addressing the five selected MAF assessment elements against ammunition program regulatory and safety performance is summarized in Table 5. Overall, the various initiatives are receiving the required attention; however the yellow status for two of the five assessment elements is indicative of the need for increased management emphasis in some areas in order for the assessment elements to progress to a rating of acceptable. The main points requiring attention are listed below:

TABLE 5 Assessment Elements Status

ASSESMENT ELEMENT	STATUS
Governance and Strategic Direction	
Policy and Programs	
People	
Risk Management	
Stewardship	

- **Governance and Strategic Direction.** The various initiatives relating to this element are on track. The implementation of the recommendations of the DCOS(Mat) led review of governance and strategic ownership of the ammunition program will be key in progressing this element to a rating of acceptable;

Corporal Dominic Quessy, with the help of the other members of his team, prepares an AIM-7 missile to be fired by a CF-18 during Exercise COMBAT ARCHER, which was held in Tyndall, Florida.

- **Policy and Programs.** Of the eight action items, the three which require increased attention include the requirement for CFSTG to resolve the contracting issues for the development of the UAR and UESO DL courses, the need to address the follow-on requirements for AESIMS, once initial capability for SIMS is delivered in 2013, and resolving process ownership to assign EX numbers for shipment of A&E to the US;
- **People.** With respect to people, the hiring of required professors at RMC in order to teach both the advanced ammunition engineering degree and ATO course is crucial to ensuring that long term professional ammunition training is available for both Military Officers and DND civilians. Solutions must be developed in order to provide ATA support to all L1 organizations with responsibilities involving A&E. Finally, there has been a continuing trend throughout all annual reports of a desultory culture of reporting of A&E occurrences by a number of Commands. This will require renewed chain of command emphasis to correct in order to strengthen the AESP;
- **Risk Management.** Extensive research and policy development have been completed in the area of risk management and this element will be considered to have a rating of acceptable with the issuance of a CANFORGEN and related A&EI to enable its use in operations and the subsequent publishing of DAOD 3002-7. The use of this new risk management process will also enable the examination of existing Air Sovereignty Operations A&E waivers for the RCAF; and
- **Stewardship.** This is, arguably, the element which requires the most significant investments. In the next reporting cycle, the demilitarization initiative needs to make tangible progress to provide a capability for the DND/CF. Environmental stewardship needs to be maintained in the formulation of A&E policy and in particular in regards to the adoption of the US Web-based Munitions Automated Environmental Analytical Capabilities for the Department. Finally, inventory control and accounting deficiencies need to be significantly improved. This last issue is now becoming a safety concern, based on several reported occurrences under the AESP involving self-contained weapons.

DAER's program of work in 2012 and 2013 will focus on advancing or monitoring the progress of various initiatives under the five assessment elements in order to continue strengthening DND/CF's AESP and to ensure due diligence in meeting the obligations of the exemption from the *Explosives Act*.

Annex A

Summary of DND/CF Ammunition and Explosives Totals by Group for Demilitarization

Table 1 — Ammunition and Explosives Pending Demilitarization/Destruction

Table 1 summarizes the totals of ammunition and explosives awaiting demilitarization or destruction. The data contained in the table is current as of 30 December 2011.

GROUP	MUNITIONS TYPES	CURRENT QTY	TOTAL WT TONNES	TOTAL PALLET	TOTAL MAGAZINES	REMARKS
A	Small Arms Ammunition (SAA) Up to and Including 50 Cal	4,794,363	165.4	151.9	1.7	
B	20mm Through 24mm	283,117	86.4	95.8	1.0	
C	25mm Through 40mm	31,298	44.6	79.3	0.9	
D	40mm Naval Through 104mm	52,790	564.2	515.6	5.1	76mm (Cougar) and 2.75 inch rocket warheads
E	105mm Through 155mm	13,466	628.6	543.8	3.0	Dual-purpose Improved Conventional Munitions (DPICM) Pending Contract-in future may be subject to the Oslo Convention (UN Convention on Cluster Munitions)
F	Aircraft Bombs	629	16.6	37.7	0.4	
G	Propellant	4,800	3.9	7.5	0.1	
H	Cartridge Actuated Devices (CADs) and Propellant Actuated Devices (PADs)	443,423	36.3	88.1	1.0	
I	Demolition Materiel	11,164	0.9	1.6	1.6	
J	Fuzes, Primers and Tracers	80,078	58.4	82.0	1.0	
K	Grenades	0	0.0	0.0	0.0	
L	Rocket Motors	84,764	322.5	951.7	4.0	CRV7 Pending Environmental Assessment Approval
M	Missiles and Rockets	15,902	118.7	719.3	3.0	66mm Rockets without graze special firing by SOF
N	All Pyrotechnics	90,019	69.4	171.5	2.0	
O	Decoy Devices	17,908	12.5	10.3	0.1	
P	Naval — Miscellaneous	3,321	6.7	10.3	0.1	
Q	Chemical — White and Red Phosphorous and CS Irritant	44,261	158.2	150.2	1.5	White and Red Phosphorous Pending Contract
R	Mines	0	0.0	0.0	0.0	
S	Munitions Scrap (Range and Disassemble) kg	**2,758,675**	2,758.7	2,109.4	3.0	Awaiting demilitarization
T	Inert Training (Dummy and Display)	3,998	8.5	17.1	17.1	
U	Aids to Production — Repack Materiel	111,095	130.5	2,403.5	25.0	
V	Spent Brass and Steel Cartridges	19,880	21.9	261.3	5.0	
W	Salvage (Links, Launch Tubes)	0	0.00	0.0	0.0	
	Total	**6,106,276 ea and 2,758,675 kg**	**5,213**	**8,408**	**77**	

Table 2 — Ammunition And Explosives Awaiting Disposal By Sale

Table 2 summarizes the totals of ammunition and explosives awaiting disposal by sale.
The data contained in the table is current as of 31 December 2011.

GROUP	MUNITIONS TYPES	CURRENT QTY	TOTAL WT TONNES	TOTAL PALLET	TOTAL MAGAZINES	REMARKS
A	Small Arms Ammunition (SAA) Up to and Including 50 Cal	2,026,390	17.7	20	0.25	9mm Blank
B	20mm Through 24mm	0	0.0			
C	25mm Through 40mm	6,548	14.2	15	0.25	35mm HE & TPT (awaiting pick up by customer)
D	40mm Naval Through 104mm	0	0.0			
E	105mm Through 155mm	6,981	226.9	349	3.00	105mm Tk
F	Aircraft Bombs	0	0.0			
G	Propellant	0	0.0			
H	Cartridge Actuated Devices (CADs) and Propellant Actuated Devices (PADs)	0	0.0			
I	Demolition Materiel	0	0.0			
J	Fuzes, Primers and Tracers	0	0.0			
K	Grenades	0	0.0			
L	Rocket Motors	0	0.0			
M	Missiles and Rockets	3,460	76.1	865	3.00	Eryx HE, planning stage
N	All Pyrotechnics	0	0.0			
O	Decoy Devices	0	0.0			
P	Naval — Miscellaneous	0	0.0			
Q	Chemical — White and Red Phosphorous and CS Irritant	15,875	26.4	13	0.20	38mm Gas Gun CS, planning stage
R	Mines	0	0.0			
S	Munitions Scrap (Range and Disassemble) kg	**0**	0.0			
T	Inert Training (Dummy and Display)	0	0.0			
U	Aids to Production — Repack Materiel	0	0.0			
V	Spent Brass and Steel Cartridges	0	0.0			
W	Salvage (Links, Launch Tubes)	227,133	227.4	189	2.00	Processed scrap (brass/metal and plastics)
	Total	**2,286,387 ea**	**589.0**	**1,451**	**8.70**	

Table 3 — Disposal By Destruction

Table 3 is a summary of the disposal by destruction that occurred in 2011.
The data contained in the table is current as of 31 December 2011.

	TOTAL QTY OF ITEMS	NET EXPLOSIVES QUANTITY	TOTAL WEIGHT	PALLETS	MAGAZINES
Energetics Dundurn	49,263	2,298.70	30.1	46.58	0.5
Energetics Units (Note 1)	0	0	0.0	0	0
Inert Munitions	112	NIL	0.5	2	0.001
Tools and Equipment	17	NIL	0.0	0.05	0.001
Aids to Production	10,032.00	NIL	0.6	2	0.001
Salvage	21,292.00	NIL	106.9	133.8	1.5
Total	**80,716 ea**	**2,298.7 kg**	**138.2 tonnes**	**184.43**	**2.003**

Note 1: The information is based on Certificate of Demilitarization form DND 2586 (required under CTAT regulations) received by DAEME. As of 31 December 2011, no "Certificates of Demilitarization" had been received from any other units or depots. This data will be reflected in the 2012 DAER Annual Report.

Note 2: DAEME has only received the completed Certificates of Demilitarization form DND 2586 from Dundurn, Gagetown, Bagotville and 7 CFSD (Edmonton)

Note 3: Not all units are submitting Adjustment Account Decrease transactions to remove materiel from their inventory once destruction/disposal has occurred, some units are taking between three to six months to complete the transactions.

Note 4: The number of Magazines is estimated based on 100 pallet spaces per magazine. There is a wide variety of magazine types in the DND/CF infrastructure inventory. The type of ammunition can affect the number of pallet spaces, as some A&E natures may be stacked while other natures may not.

Annex B

Summary of Unexploded Explosive Ordnance and Legacy Sites Program Activities for 2011

The UXO and Legacy Sites Program (the Program) continued its work throughout 2011 of providing risk management activities at sites affected by UXO across the country. Risk management activities including clearance work, surface sweeps, site characterization and risk communications occurred at over 26 Legacy Management Areas. A summary of these activities can be seen in the tables below.

A main component of the Department's Risk Management strategy on Legacy Sites is to properly inform the public of potential risks. 2011 was a very successful year with respect to communication activities, which included the continuation of the schools program in 18 schools, reaching over 1000 students. The Program also delivered 44 individual stakeholder meetings, 17 site-specific safety briefings, two public information sessions and participated in three public fairs and exhibitions.

The Program continued to prioritize sites at a national or "programmatic" level and has made significant progress in refining its site assessment methodology. The site assessment methodology builds upon existing Program tools and ensures a consistent and defendable approach for the Department in how sites are identified for potential future risk management. Integral to the assessment methodology, is the use of the Initial Risk Assessment Report (IRAR). The IRAR clarifies the existence of a departmental obligation at a given site, articulates the level of risk at that site and identifies any immediate risk management activities that may need to occur. Once a site has been identified for longer term management, a Project Director is assigned. The Project Director uses the Record of Legacy Sites Risk Management (RLSRM) to determine the level of risk at a site and how it relates to specific land uses and, subsequently, what mitigation/management activities need to be implemented to ensure public safety.

The Program has worked throughout the fiscal year to modify its UXO risk site assessment process — Record of Legacy Sites Risk Management (RLSRM) — to conform to the DAER's draft DAOD 3002-7 and will promulgate and implement the Legacy Site Risk Assessment (LSRA) process in FY 12/13. In addition to UXO safety, the LSRA recognizes other factors such as aboriginal considerations, political commitments, and environmental/ecological factors when establishing potential departmental requirements/obligations.

Looking forward to 2012, the Program will continue to provide risk management activities on legacy sites nationwide. Incorporating new tools such as the LSRA, implementing proven site assessment methodologies and working with project implementation partners across ADM(IE), the Program is well positioned to execute its mandate of ensuring public safety in UXO affected areas.

Weapons Engineering Technician (Sonar), Petty Officer Second Class (PO2) Jason Campbell receives 57mm ammunition during an ammunition download on HMCS Vancouver. *The ship's weapons are made safe on board before entering the port of Souda on the Island of Crete, Greece during Operation MOBILE.*

Central Region

SITE NAME	LEGACY ISSUE	ACTIVITIES CONDUCTED IN 2011 AND PLANNED ACTIVITIES	RISK ASSESSMENT	
			IRAR	RLSRM
Churchill, MB	The Churchill area was historically used for live-fire training at multiple ranges.	■ Site reconnaissance complete ■ On-going communication activities ■ On-going risk management activities ■ Shoreline sweeps completed in 2011 ■ Planned additional shoreline sweeps and site characterization for 2012	Revision 1 – High	Currently being drafted
Mamainse Point, ON	The site was used for anti-aircraft training by Canadian and US forces in the 1950s. The site was transferred to Ontario in 1969.	■ Site reconnaissance complete ■ Ongoing communication activities	Revision 1 – Medium	
Melbourne, ON	Former BCATP site. Potentially 200 ha of UXO affected property situated on First Nations Land in a proposed residential development.	■ On-going communication activities ■ Environmental sampling complete ■ Site characterization completed in 2011		Currently being drafted
Prince Edward County, ON	Multiple legacy sites with confirmed UXO affected land resulting from BCATP, RCAF, and Army training.	■ On-going site characterization, including wide area assessment ■ On-going UXO avoidance activities ■ On-going communication activities ■ On-going annual surface sweeps up to 2015		Site — Canadian Air Weapons Range Unmitigated Risk: Medium Mitigated Risk: Low
Rivers, MB	Former Canadian Forces Base. 26 ha adjacent to airstrip cleared after civilian injury in 2007.	■ On-going communication activities ■ Survey and clearance activities complete ■ On-going risk management activities		Unmitigated Risk: Medium Mitigated Risk: Low
Shilo, MB	The site of Military activity in the region since 1910.	■ Site reconnaissance complete ■ Planned communication activities ■ Planned site characterization of Spirit Sands	Site — Spirit Sands Revision 1 — Medium Site — Camp Hughes Revision 1 — Medium	
Teslin-Nisultin Delta, YK	Nisutlin Bay was used as a high explosive (HE) bombing range by DND in the early 1950s.	■ On-going historical research ■ On-going communication activities ■ Planned risk management activities		Unmitigated Risk: Medium Mitigated Risk: Low
Watson Lake, YK	Former RCAF Station including air-to-ground gunnery and HE bombing ranges.	■ Limited site characterization complete at one response site ■ On-going historical research ■ On-going communication activities		Currently being drafted

Central Region (cont'd)

SITE NAME	LEGACY ISSUE	ACTIVITIES CONDUCTED IN 2011 AND PLANNED ACTIVITIES	RISK ASSESSMENT	
			IRAR	RLSRM
Winisk, ON	RCAF Station Winisk was operational during the 1950s and 1960s. Remnant explosives were identified at the site.	■ Site reconnaissance complete ■ Risk management activities ongoing ■ On-going communication activities	Revision 1 — Medium	
Brockville, ON	Home to No.30 OTC the Brockville area was used for extensive military training during the 1940s.	■ Initial site assessment ■ Risk management activities ongoing	Site — North Farmland Revision 0 — High Site — St Lawrence Revision 0 — Medium Site — Range Area Revision 0 — High	

Québec Region

SITE NAME	LEGACY ISSUE	ACTIVITIES CONDUCTED IN 2011 AND PLANNED ACTIVITIES	RISK ASSESSMENT		
			IRAR	RLSRM	
Granby, QC	Former WWII A&E factory, including some munitions testing activities. A&E debris have been found at the site.	■ Limited site characterization ■ On-going surface clearance ■ Final site characterization ■ Clearance support for construction support ■ Communication activities (school program)	Revision 1 — Low Clean-up required.	Currently being drafted	
Lac St-Pierre, QC	Former A&E testing facility located on the St. Lawrence. One confirmed UXO related death in 1982.	■ On-going shoreline sweeps ■ On-going site characterization ■ On-going communication activities ■ Construction support ■ UXO avoidance ■ Water-based clearance	Low	Low	
Port of Gaspé, QC	Former naval coastal defence site at which the potential presence of A&E is possible.	■ Site reconnaissance complete ■ Completed risk assessment activities		Unmitigated Risk Low	Mitigated Risk Low
Réserve Faunique des Laurentides	Rocket pods were encountered by a local resident. The items were likely jettisoned or part of a crash site.	■ Site reconnaissance complete ■ On-going communication activities	Revision 1 — Medium No further action required.		

Western Region

SITE NAME	LEGACY ISSUE	ACTIVITIES CONDUCTED IN 2011 AND PLANNED ACTIVITIES	RISK ASSESSMENT		
			IRAR	RLSRM	
Kamloops, BC	Former RCAF ammunition depot. Buried munitions were identified at the site.	■ Site reconnaissance complete ■ On-going site characterization ■ On-going communication activities ■ Planned scrap sifting/screening activities and geophysical survey	Revision 1 — High	Currently being drafted	
Medicine Hat, AB	Scrap metal recycling facilities; approximately 365 tonnes of munitions scrap was identified at the sites.	■ On-going scrap screening and removal. 23 items of pyrotechnics, 14 HE filled rounds and 2 inert projectiles were found.	Revision 2 — Low No further action required.		
Rogers Pass, AB	Support to Operation PALACI Avalanche Control Program between DND and Parks Canada.	■ Site reconnaissance complete ■ On-going clearance support provided annually		Unmitigated Risk	Mitigated Risk
				Medium	Low
TTN First Nations, AB	5300 ha of potentially UXO-affected land from approximately 70 years of live-fire practice by the military from 1908 to 1980. A major clearance occurred in the area during period 1985–2005. Residual UXO risk is unknown.	■ On-going surface sweeps ■ On-going site characterization ■ On-going communication and education activities ■ Clearance support for local construction		Currently being drafted	
Vernon, BC	20,000 ha of potentially UXO-affected land resulting from long term military manoeuvre training. Since the end of World War II, 10 confirmed UXO-related deaths.	■ On-going site characterization ■ On-going communication activities ■ Remote sensing survey (ortho LIDAR) planned		Currently being drafted	
Yekau Lake, AB	Former BCATP site. Site characterisation has identified an impacted zone of potentially 60 ha located on First Nations Land in a proposed golf course development.	■ On-going site characterization ■ On-going communication activities ■ On-going risk management activities ■ Planned UXO clearance operation		Currently being drafted	
Batchelor Bay, BC	A total of four A&E items encountered while construction personnel were excavating an area. A Ground Penetrating Radar (GPR) survey was conducted and the results indicated one additional area of concern.	■ Provided quick response construction support	Revision 0 — High No further action required.		

Eastern Region and Underwater

SITE NAME	LEGACY ISSUE	ACTIVITIES CONDUCTED IN 2011 AND PLANNED ACTIVITIES	RISK ASSESSMENT		
			IRAR	RLSRM	
Debert, NS	Former Camp Debert housed over 300,000 troops during WWII, and included multiple ranges and training areas.	■ Site reconnaissance complete ■ On-going UXO avoidance activities ■ Planned risk management activities	Belmont Range Medium Cobequid Bay Low Colquhoun Range High Horse Point Low Main Base Low Spencer's Point Medium Staples Brook Medium Training and Demolition Area Medium		
HMS Raleigh, NL	Light cruiser shipwreck off the coast of Newfoundland. Clearances and shoreline sweeps have been completed in the past yet munitions debris occasionally wash ashore.	■ On-going communication activities		Currently being drafted	
HMCS Thiepval, BC	Battle class converted trawler shipwreck off the coast of British Columbia.	■ Planned site characterization ■ On-going communication activities		Unmitigated Risk Medium	Mitigated Risk Low
Shelburne Shipyards, NS	Former naval shipyard facility presently undergoing modernization. Possible existence of A&E reported, as suspect A&E items were observed.	■ Site reconnaissance complete ■ Site characterization completed ■ Planned construction support		Unmitigated Risk Low	Mitigated Risk Low
SS Claire Lilly, NS	A&E transport shipwreck off the coast of Nova Scotia.	■ Site characterization completed ■ On-going communication activities		Unmitigated Risk Medium	Mitigated Risk Low
SS PLM 27, NL	Carrier shipwreck off the coast of Newfoundland.	■ Planned site characterization	Survey in June RLSRM to follow.		
SS Saganaga, NL	Carrier shipwreck off the coast of Newfoundland	■ Planned site characterization	Survey in June RLSRM to follow.		
Tracadie, NB	Former military range undergoing recurring review, as previously cleared lands have residual UXO risk.	■ On-going site characterization ■ On-going communication activities		Unmitigated Risk High	Mitigated Risk Low

Eastern Region and Underwater (cont'd)

SITE NAME	LEGACY ISSUE	ACTIVITIES CONDUCTED IN 2011 AND PLANNED ACTIVITIES	RISK ASSESSMENT		
			IRAR	RLSRM	
USAT BGen Zalinkski, BC	US Army Transport shipwreck which may be subject to an oil recovery project by the Canadian Coast Guard.	■ Planned site characterization		Unmitigated Risk	Mitigated Risk
				Low	Low
Wrights Cove, NS	Property in the vicinity of the 1945 Bedford Magazine explosion site.	■ On-going risk assessment activities		Unmitigated Risk	Mitigated Risk
				Medium	Low
McGivney, NB	Former depot site expropriated from the Province of New Brunswick in 1942.	■ Surface sweep ■ Follow up site monitoring	Revision 1 — Medium		

Annex C
Status of Main Policy Manuals

The following is a record of the CF/DND A&E policy documents. It has been updated by the OPIs to show the latest versions to provide practitioners a guide to the most up-to-date information available.

A&E DAODs			
Document / Subject / Theme	**Brief Description**	**Date Current Document Published**	**Comment**
3002-0	Ammunition and Explosives	November 2006	To be updated in 2012
3002-1	Certification of Ammunition and Explosives	July 2004	Update awaiting translation
3002-2	Insensitive Munitions	July 2004	Update awaiting translation
3002-3	Ammunition and Explosives Safety Program	December 2007	To be reviewed in 2012
3002-4	Ammunition or Explosives Accident, Incident, Defect or Malfunction Reporting	December 2007	To be reviewed in 2012
3002-5	Use of Firearms, Ammunition and Explosives	December 2007	To be updated in 2012
3002-6	Display Fireworks	December 2010	Current
3002-7	Ammunition and Explosives Risk Management	New publication	To be published in 2012
C-09-005 SERIES			
Document / Subject / Theme	**Brief Description**	**Date Current Document Published**	**Comment**
C-09-005-001/TS-000	Volume 1 — Ammunition and Explosives Program Management and Life Cycle Safety	Undergoing translation To be published in 2012	Replaces A&EIs 13, 19 (Draft), 15, 17 and portions of C-09-153-001/TS-000
C-09-005-002/TS-000	Volume 2 — Storage and Facility Operations (including storage related operations)	Undergoing translation To be published in 2012	Replaces A&EIs 03/07, 12, 16, 21, 22 (draft) and portions of C-09-153-001/TS-000
C-09-005-003/TS-000	Volume 3 — Transportation	Published 1 January 2011	Replaces portions of C-09-153-001/TS-000
C-09-005-004/TS-000	Volume 4 — Demilitarization and Disposal	To be published in 2012	Replaces C-09-008-001/TS-000 published Oct 1993
C-09-005-005/TS-000	Volume 5 — Deployed Operations (encompasses FOB, Field, BLAHA and deployed ops Risk Assessment & Clearance of BDV)	To be published in 2012	Replaces A&EI 23 and C-09-153-001/TS-000 Part 4 Sect 15
C-09-005-006/TS-000	Volume 6 — Naval Vessels	To be published in 2013	Replaces C-09-153-003/TS-000 Published Mar 2008
C-09-005-007/TS-000	Volume 7 — Certification of Ammunition, Explosives and Accessories for Service Use	Published December 2011	Replaces A&EI 27 and D-09-002-010/SG-000 Published Mar 2007
C-09-005-008/TS-000	Volume 8 — Construction Standards	To be published in 2013	Replaces A&EI 26 (Draft), 28 (Draft), and portions of C-09-153-001/TS-000
C-09-005-008/TS-000	Volume 9 — HERO	To be published in 2014	To incorporate HERO aspects of Vol 1

AMMUNITION AND EXPLOSIVES INSTRUCTIONS			
Document / Subject / Theme	**Brief Description**	**Date Current Document Published**	**Comment**
01/07	Ammunition and Explosives Instructions	May 2007	
02/07	Review of Ammunition and Explosives Regulations and Instructions	June 2007	
03/07	Ammunition and Explosives Storage Licensing	July 2007	To be included in new Volume 2 of the C-09-005 series
04	Transportation of Ammunition and Explosives Recovered during Domestic Explosive Ordnance Disposal Operations	March 2008	Cancelled Superseded by C-09-005-003/ TS-000
05	Transportation of Munitions Scrap	July 2010	Cancelled Superseded by C-09-005-003/ TS-000
06	Removal of Hard Targets from CF Ranges and Training Areas	December 2008	Change 1
07	Ammunition Accident/Incident Investigation and Reporting	May 2008	
08	Plastic Coated Tape, Explosives Safety Hazard — Electrostatic Discharge	February 2008	
09	Crimping of Non-Electric Blasting Caps — Procedures and Protective Equipment	February 2008	
10	Cartridge Signal 16mm No 1 Mk3	February 2008	
11	Disposal of Ammunition and Explosives at End of Life Cycle	September 2011	Change 1
12	Ammunition Salvage Buildings	April 2009	To be included in new Volume 2 of the C-09-005 series
13	Ammunition Amnesty Box Program	May 2009	To be included in new Volume 1 of the C-09-005 series
14	Mitigation of Blast and Fragmentation Effects Utilizing Sandbags	December 2008	
15	Recognized Civilian Qualifications Applicable to Ammunition and Explosives Employment	August 2010	Change 2 To be included in new Volume 1 of the C-09-005 series
16	Small Quantity Distance Tables	September 2009	Change 1 To be included in new Volume 2 of the C-09-005 series
17	Civilian Qualification Expiry Criteria	January 2009	To be included in new Volume 1 of the C-09-005 series
18	Civilian Ammunition Technician Specification	November 2009	
19	Personnel Qualifications Matrix	In development	To be included in new Volume 1 of the C-09-005 series
20	Gauging for Serviceability — Cartridge 20mm Dummy C145A1		Cancelled
21	Containment Vessels Siting and Storage Instructions	October 2009	To be included in new Volume 2 of the C-09-005 series
22	Public Traffic Routes and Densities	In development	To be included in new Volume 2 of the C-09-005 series
23	Explosive Clearance Inspection of Battle Damaged Vehicles	December 2009	To be included in new Volume 5 of the C-09-005 series

AMMUNITION AND EXPLOSIVES INSTRUCTIONS			
Document / Subject / Theme	**Brief Description**	**Date Current Document Published**	**Comment**
24	Transfer of Small Quantities of Ammunition and Explosives Within HMC Dockyards	March 2010	Change 1
25	Stowage of Expendable Targets on Board HMC Ships	February 2010	
26	Construction Guidance for Facility Electrical Systems	In development	To be included in new Volume 8 of the C-09-005 series
27	Ammunition Safety and Suitability for Service Assessments — Class Decisions	May 2010	Cancelled Superseded by C-09-005-007/ TS-000
28	Construction Guidance for Facility Heating Appliances	In development	To be included in new Volume 8 of the C-09-005 series
29	Packaging and Return of Surplus Gun Propellant and Mortar Propellant Increments to Ammunition Facilities	April 2011	Change 1
30	Accidental Small Arms Discharge Reporting	December 2010	Change 1
31	Destruction by Open Burning of Bulk Propellant, Mortar Increments and Artillery Charges on Approved Burning Trays	August 2011	To be included in new Vol 4 of the C-09-005 series
32	Ammunition and Explosives Safety Survey and Inspection	April 2011	
33	Flare Aircraft Parachute LUU-2D/B		Controlled by DAEME
34	Approved Misfire Procedure for Electrically Initiated Disposal Operations	October 2011	
UNEXPLODED ORDNANCE (UXO) — POLICY			
Document / Subject / Theme	**Brief Description**	**Date Current Document Published**	**Comment**
Standard 1606-4000.1-S02-020	Technical Instruction for Unexploded Explosive Ordnance (UXO) *Activities*	2010	Current Supersedes ADM(IE) Standard 01/2008 dated 12 May 2008 OPI — ADM(IE)
ADM(IE) Standard 1606-4000.1-S10-020	Assignment of Responsibility for Managing Legacy Site Responsibilities		Current OPI — ADM(IE)
ADM(IE) Standard 1606-4000.1-S01- 024	Sustainable Range and Training Area Management		Current OPI — ADM(IE)
CANFORGEN 181/06 ADM(IE) 002 282157Z NOV 06	DND UXO and Legacy Sites Program		Current OPI — ADM(IE)
B-GL-381-003/TS-000	Range and UXO Clearance Handbook		To be republished in 2012 OPI — CLS/LFDTS
DAPC Pol Policy Guidance	Procedures for Reporting and Destroying Chemical Weapons Discovered at DND/CF Facilities	Amendment, 02 August 2005	Current OPI — DAPC Pol

EOD			
Document / Subject / Theme	**Brief Description**	**Date Current Document Published**	**Comment**
B-GJ-005-316/FP-001	CFJP 3.16 — EOD	September 2011	Promulgation Draft OPI — CFEOD
C-09-008-002/FP-000	Duds and Misfires Ammunition on CF Ranges and Training Areas	August 2005	To be republished in 2012
C-09-008-003/FP-000	Explosive Ordnance Disposal — Disposal of Stray Ammunition	May 2003	To be republished in 2012
Defence Administrative Order and Directive (DAOD) 8000-0	Explosive Ordnance Disposal	September 2003	Under revision OPI — CF EOD
Defence Administrative Order and Directive DAOD 8000-1	Explosive Ordnance Disposal Instructions	September 2003	Under revision OPI — CF EOD
INTERNATIONAL POLICY DEVELOPMENT			
Document / Subject / Theme	**Brief Description**	**Date Current Document Published**	**Comment**
Informal Working Paper (IWP) 1 — Risk Management for Deployed Operations IWP 2 — Operational Storage Principles for Manoeuvre Warfare IWP 3 — AASTP-1 Custodian Working Group 14 Sep 10 Record of Discussion DDESB Paper — Risk Management Process for Ammunition and Explosives	This series of papers are designed to develop NATO A&E guidelines for domestic and deployed Multi-national operations in order to ensure international acceptance and application of safety standards. This includes the extension of rule-based to risk-based criteria for all aspects of the life cycle.		
EXTERNAL LIAISON			
Document / Subject / Theme	**Brief Description**	**Date Current Document Published**	**Comment**
Avalanche Control	MOU between DND and Parks Canada assistance to OP PALACI	October 2006 (1 year extension to October 2012)	CANADA Com manages OP PALACI and leads the DND working group on MOU renewal

RCN A&E POLICY			
Document / Subject / Theme	**Brief Description**	**Date Current Document Published**	**Comment**
MARCORD 46-8	Defines the organizational structure and the requirements of the Maritime AESP	November 08	OPI — RCN
MARCORD CS-06	Transportation of Explosives and Ammunition by Motor Transport, Ammunition Lighter, and Military Aircraft Within Maritime Command	August 07	OPI — RCN
CA A&E POLICY			
Document / Subject / Theme	**Brief Description**	**Date Current Document Published**	**Comment**
CANFORGEN 225/11	Management Authority for DND/CF Range and Field Safety	December 2011	
LFCO 22-11	LFC Range Clearance	September 1995	OPI — CA
LFCO 22-12	Operational EOD	December 1995	OPI — CA
RCAF A&E POLICY			
Document / Subject / Theme	**Brief Description**	**Date Current Document Published**	**Comment**
B-GA-297-001/TS-000	Safety Orders for the Canadian Forces Air Weapons Systems	June 2010	OPI — RCAF

Annex D

Ammunition and Explosives Safety Program Analysis for the Year 2011

Deaths and Injuries. There were no deaths reported under the AESP in 2011. As shown in AESP Analysis Figure 1, there were 14 injuries in 2011: 13 CF members and one civilian employee were injured in 13 accidents. Four of the injuries occurred in three in-theatre accidents: the remainder occurred in Canada.

For 2011, the number[58] of deaths and injuries (Figure 2) is considerably below the 10 year average of 24. In 2011, there was only a single accident that injured more than one individual, when two members were injured when a fragmentation grenade reportedly fell from a tactical vest pocket (not the issued grenade pouch). Two other members were injured in separate events when A&E failed to perform to standard: one was knocked unconscious when an M72 rocket exploded as he was firing it; and a bystander was injured by a defective parachute flare.

Number of Occurrences. A total of 182 Ammunition Accidents and Incidents, inclusive of ammunition related Flight Safety Occurrences,[59] were recorded in 2011: 41 Accidents and 141 Incidents. This is lower than the peak year of 2010, but comparable to 2009. AESP Analysis Figure 3 puts this in a 10-year perspective. The dotted red line between 2006 and 2007 indicates the start of data collection under the new regulatory framework.

In order to understand underlying reasons for the flux and examine the distribution by commands, at Figure 1 below, occurrences were rolled up according to the organization responsible for property (through chain of command of the Base Commander) or the responsible Operational Command in Operations (CEFCOM or CANSOFCOM). Thus, all FSOMS reported ammunition-related occurrences from theatre were attributed to CEFCOM rather than C Air Force. All ship-related occurrences have been rolled to C Navy due to the unique nature of naval operations. In the absence of evidence to the contrary, all Land occurrences roll to C Army, with the exception of accidents and incidents that occur:

Corporal (Cpl) Ryan Asbury, Ammunition Technician from Canadian Forces Base (CFB) Shilo deployed with the Mission Closure Unit (MCU), is sorting smoke grenades by colour.

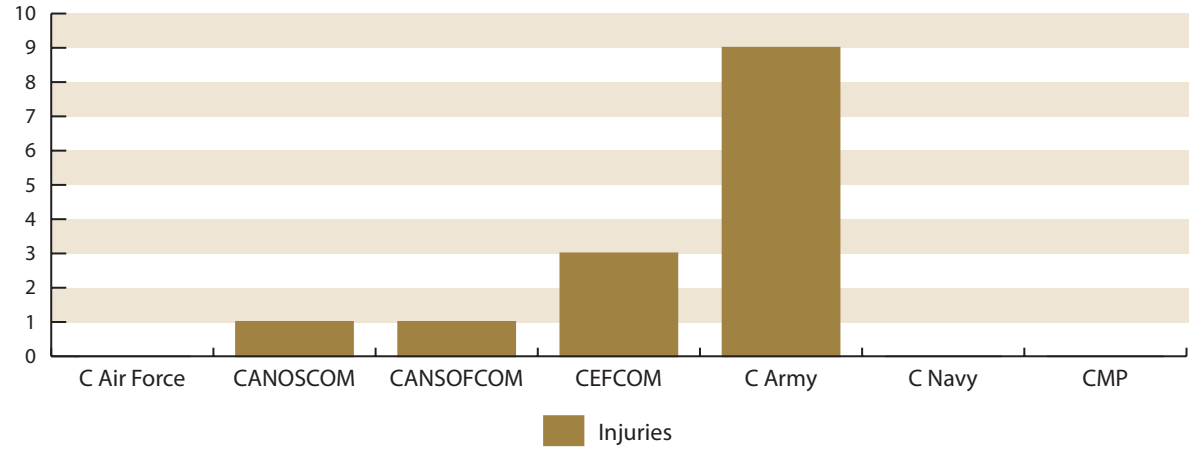
- In theatre (roll to CEFCOM or CANSOFCOM)
- At CFB Borden (responsible to MILPERSCOM); and
- CANSOFCOM, when attributed, roll to CANSOFCOM.

Figure 4 shows the distribution of 2011 accidents and incidents by command, using the attribution method mentioned above. Figure 5 provides a five-year perspective on occurrences, again by command. Others refer to accidents or incidents occurring outside of active bases, like UXO contractors doing clearance work, or on real property owned by small land owners, like Canada COM JTF North or ADM(S&T).

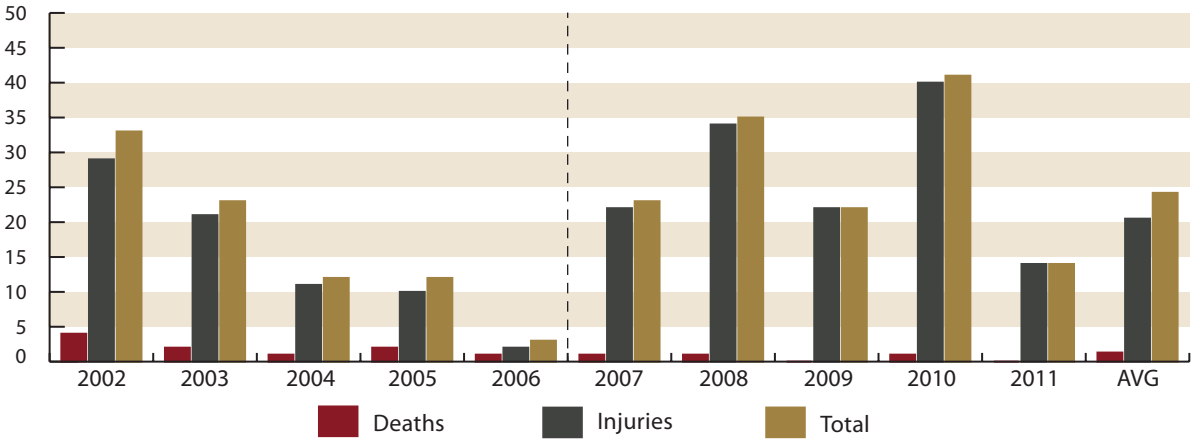
[58] Data includes two accidents not reported under the AESP but garnered from a coordinated search of General Safety Program records. Comparison of program records indicated 11 injuries reported under the AESP but not reported by DND 663 Hazardous Occurrence Report.

[59] AESP definitions for accident and incident do not correspond to those used within the Flight Safety Program. See A-GG-040-006/AG-002 DND Ammunition or Explosives Accident/Incident/Defect/Malfunction Reporting, Chapter 1. The AESP has a DND/CF wide mandate. The reporting procedures have been modified to accept FSOMS reports in order to eliminate the requirement for duplicate reporting.

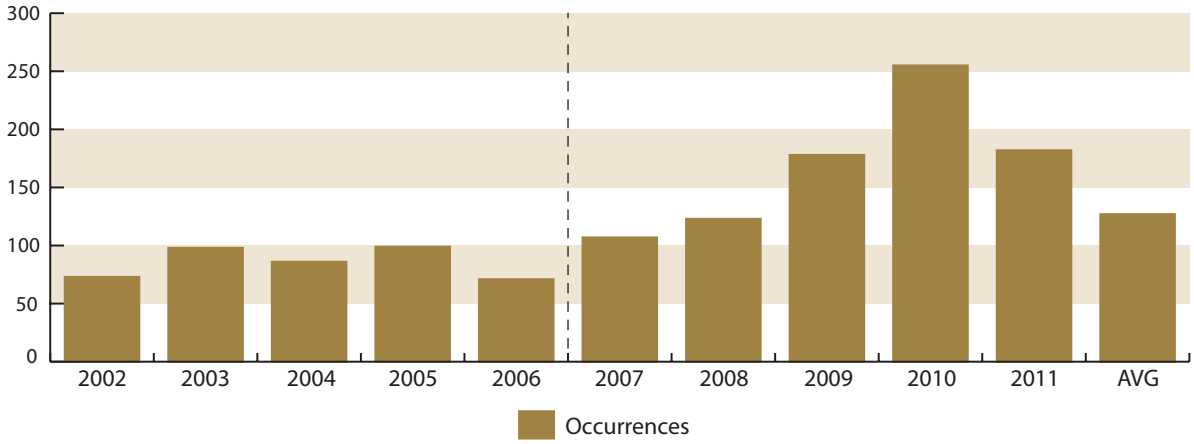
AESP Analysis Figure 1 **Injuries**



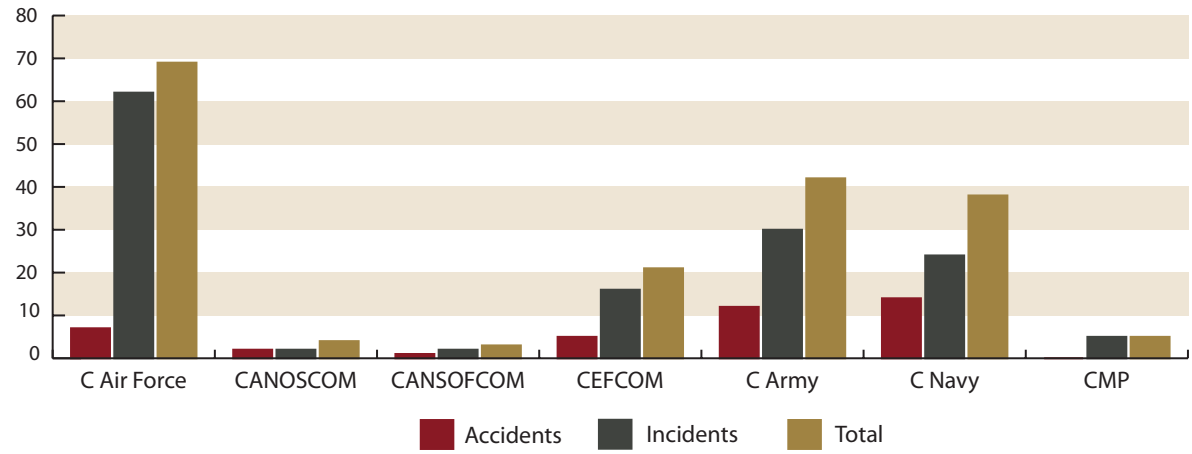
AESP Analysis Figure 2 **Deaths and Injuries**



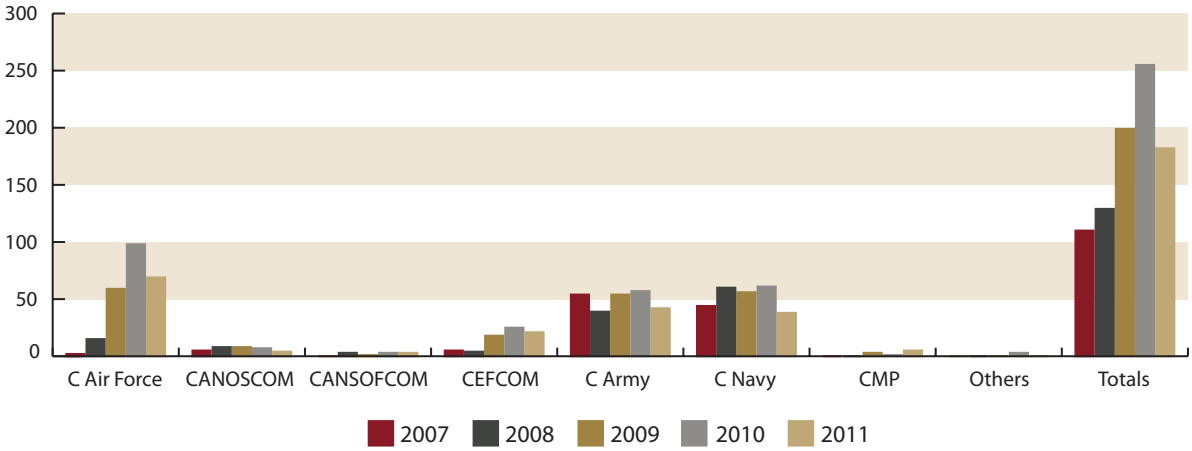
AESP Analysis Figure 3 **Occurrences for 2002–2011**



AESP Analysis Figure 4 **Occurrences for 2011**



AESP Analysis Figure 5 **Occurrences by Command 2007–2011**



In 2010, the large increase in reporting was attributed to increased frequency of C Air Force reporting, mostly as a result of increased force generation activities in support of theatre operations. The decline from 2010 to 2011 for both C Air Force and C Army is attributed in part to a drawdown of operations in Afghanistan. In the case of C Air Force, this was somewhat offset by operations over Libya, exacerbated by the rapid deployment. The decrease in C Navy reports does not represent a decrease in reporting, but reflects a decision to not record certain events that had been included in previous years (eg. dislodgement of MLMs, false alarm arming/throwing of Markers Man-over-board).

While the relative decrease in C Army reporting can be explained in terms of reduced level of effort in theatre, the serious concern expressed in previous annual reports continues: the overall level of reporting is deficient. The decline in C Army injuries, from 20 in 2010 to nine in 2011, is encouraging.

CEFCOM merits further consideration. Of the 21 reports received, 17 originated from C Air Force generated units. Only four, two accidents and two incidents, originated from C Army generated units. The two accidents involved injuries to three members. The incidents involved near injury of an Ammunition Technician sorting unit salvage — a tampered paraflare component functioned in proximity to his face — and members mailing prohibited items from theatre. Reporting concerns continue with respect to CEFCOM and its land units. The number and nature of reports received were not commensurate with the tempo of operations and the significant training conducted in theatre. The lack of specialist ammunition staff within CEFCOM is a hindrance to alleviation of the problem. L1 ATA support to CEFCOM needs to be examined.[60]

[60] L1 ATA support to CEFCOM is presently provided by CANOSCOM/J4 Ammunition

The tendency for units to not always diligently report occurrences during training appears to be carried over into theatre. In Canada, the Base support organization provides the structure for investigation, reporting and resolution of A&E accidents and incidents. Units in theatre operate much more independently. The onus for reporting is already on the unit. Unit commanders need to be held to this responsibility by higher commanders.

Despite the intensity of CANSOFCOM operations and training, only three occurrences were reported — one accident[61] and two incidents. Two of the three occurred in-theatre. One involved a loss of control over self-contained weapons. Despite the presence of an Ammunition Technical Authority within CANSOFCOM, improvement in reporting ethos is required.

MILPERSCOM is responsible for CFB Borden, a major training centre, and for much of southern Ontario. Despite the high volume of on-base training and large number of Reserve units supported by this base, only five incidents were reported during 2011. This is up from one incident in 2010. The initiation of an active Ammunition and Explosives Safety Program and committee structure during the reporting year would appear to be moving this issue in the right direction. The establishment of a Level 1 Ammunition Technical Authority within MILPERSCOM must seriously be considered.

Lateness of reporting is also an issue: approximately 15% of all initial reports were filed three or more days late. The target is 12 hours for the initial report. Three of four CANOSCOM reports (all from one location), two of three CANSOFCOM and approximately 25% of C Army and C Navy initial reports were three or more days late.

AESP data was compared with General Safety Program data. As a result, two accidents were added to the AESP database and nine accidents (10 injuries) were added to the General Safety Program records. When reporting does occur, the requirement for reporting under multiple safety programs is not always being met.

Common User natures (SAA, smoke grenades and pyrotechnics, and CADs and PADs) continue to be involved in a high percentage of incidents and accidents. Within C Air Force units, CAD/PADs (18), and aircraft bombs (13) were the items most frequently involved.

Cause Categories. All 182 Accidents and Incidents in 2011 were attributed a primary (or direct) cause. They are summarized at AESP Analysis Table 1:

AESP ANALYSIS TABLE 1 — Cause Categories

CAUSE CATEGORY	NUMBER	PERSONNEL RELATED
Deliberate Deviation	29	154
Human Error (error in drill, mistake, poor judgement)	125	
Ammunition-related (defect, malfunction, design error)	9	
Other Causes	5	
System-related	10	
Weapon-related	4	
Unassigned	0	
TOTAL	**182**	**154**

While primary causes are relatively easy to identify, secondary and tertiary causes are much more difficult, and the current reporting system does not cater to these in an adequate manner. As described in section 4 of the report, a new policy is being developed and the reporting part of the new policy will include new causal evaluation tools.

Approximately 3% were categorized as Other, a category including one incident wherein a cause could not be determined (bomb that failed to guide). The wide range of ammunition natures and circumstances preclude any trend analysis on this category.

While ammunition functioned as intended for the most part, there were still nine occurrences attributed to ammunition faults. One injury was also attributed to this category: one member, a bystander, was injured when a parachute flare misfired and struck him.

Personnel were responsible for 84% of all accidents and incidents. Carelessness, poor judgement, errors in drill were typical causes. Further analysis will be conducted with the aim of focusing the Outreach Campaign.

Deliberate Deviations represented 15% (comparable to 2010) of all events and are of particular concern as in these cases procedures have been deliberately contravened. Accidents and incidents related to Deliberate Deviations are indicated in the 2011 Accident and Incident Summaries with a grey background. Three injuries (two in a grenade

[61] Another accident wherein an Ammunition Technician was injured while sorting through salvage returned by a SOFCOM unit was attributed to C Army (rolled up through the support base), although the fault originated with the SOFCOM unit.

explosion and one during mortar firing) resulted from Deliberate Deviations. During the latter, the injured member performed an error in drill: the accident was categorized as a Deliberate Deviation, as the supervisor knew the member was not trained to perform the assigned task. The relatively large number (29), and the nature thereof, of the Deliberate Deviations tend to suggest a lack of respect for established drills and procedures. Of the 29 occurrences categorized as Deliberate Deviations, one occurred within CANOSCOM, one within C Air Force, two within C Navy, three within CEFCOM and the remaining 22 occurred within C Army units.

In 2009, DAER released A&EI 13 Amnesty Box Program. This A&EI outlined amnesty boxes are intended for the collection of small quantities of pyrotechnics and small arms ammunition (SAA) that may have unintentionally been removed from a range or training area. They are not for any quantity of explosive or high explosive (HE) ammunition, a disposal method for dud or misfired A&E or an alternate means for units to return unused quantities of any A&E to their unit or second line A&E facility. A&EI 13 also outlines who is qualified and authorized to empty them. These factors were identified in a number of A&E incidents regarding amnesty box misuse that placed personnel at risk due to the type or condition of A&E placed in them. Incidents below provide further evidence of the need for better management and control of A&E at unit level, of which Amnesty Boxes are only one aspect:

- Misuse of Amnesty Boxes:
  - A quantity of detonating cord and C4 plastic explosive put in an amnesty box;
  - A C13 HE fragmentation grenade put in an amnesty box;
  - Four dud thunderflashes put into an amnesty box; and
  - 1,500 rounds each of packaged 5.56mm ball and 5.56mm blank, 100 rounds of 5.56mm blank link, 12 rounds 7.62mm 4 ball 1 tracer linked, 25 rounds of 7.62mm blank link, and four thunderflashes left beside an amnesty box.

- Lack of control over self-contained weapons,[62] for which there are rigorous controls:
  - A C13 HE fragmentation grenade found in a tactical vest returned to clothing stores from operations in Afghanistan;
  - A C13 HE fragmentation grenade put in an amnesty box;
  - Two instances of C13 HE fragmentation grenades reported deficient from unit stocks; and
  - One report of an M72 Light Anti-Tank Weapon recovered from a US soldier (in continental USA).

- Abandonment of A&E:
  - In one incident, 113 smoke grenades were left in a training area;
  - A Grenade Hand Smoke abandoned near Base HQ;
  - Multiple pyrotechnics recovered from administration area;
  - Pyrotechnics and SAA abandoned by a crossing gate;
  - A 105mm round left on the road with "Damaged" marked on the side; and
  - A Cartridge 40mm Practice abandoned along base's health trail.

- Improper disposal:
  - SAA and range scrap discovered in a dumpster;
  - Blank SAA and casings recovered from ground at commercial car wash; and
  - SAA recovered by contractor from chemical toilet.

- Poor clearance practices:
  - A smoke grenade left in the glove compartment of a vehicle sent to a civilian garage for maintenance;
  - Detonators discovered in vehicle sent to 202 Workshop Depot; and
  - SAA discovered in ship's magazine that had been certified as Free From Explosives (FFE).

- Theft, improper use:
  - Use of military pyrotechnics in a PMQ yard;
  - Attempted use of propelling charge as adventure training fire starter;
  - Recovery of 25mm round from member's vehicle during driving arrest;
  - Simulator recovered from beside fish pond;
  - Bundles of Thunderflashes recovered from training area (aggregating is specifically banned); and
  - Cache of demolition explosives discovered on EOD range.

[62] In 2010 a C13 HE fragmentation grenade was recovered on an EOD call and another was discovered within a unit salvage return.

A member of the HMCS Charlottetown's *boarding party conducts stoppage drills on the flight deck during OP MOBILE.*

- Unsafe Unit Salvage Returns:
  - Tampered paraflare returned with salvage (functioned while salvage was being processed);
  - M60 Igniter functioned while technician was processing unit salvage return;
  - Dud pyrotechnics discovered in unit salvage return;
  - Dud pyrotechnics discovered in salvage bags certified by unit personnel as FFE; and
  - Dud and partially functioned pyrotechnic discovered in salvage bags certified by unit personnel as FFE.

These incidents point to the failure of units in the control of A&E. The first three categories call into question the accuracy of A&E expenditure certifications and adjustment transactions — especially troubling when self-contained weapons are concerned. These types of incidents clearly indicate the control required to properly manage A&E inventories is not being exercised to its fullest in the use phase of the life cycle.

All of the above listed occurrences, less four, involved Land units. A greater focus on A&E Safety at all levels of command appears to be warranted.

While units may not dedicate the time to allow for proper clearance of kit and vehicles, individuals with ammunition in their homes, quarters or personal vehicles and individuals who use pyrotechnics as "fireworks" know they are in the wrong. Indiscriminate discarding of live ammunition indicates a failure of individual members to comprehend the dangers from such action — or a lack of care. Both possibilities raise serious concerns about the state of A&E safety knowledge and education within C Army units. A more active program of A&E safety education is recommended.

Appendix 1 to Annex D

Accident Summary for the Year 2011

Accident Summary. The following table summarizes accidents that occurred in 2011. Greyed out cells indicate a deliberate violation.

SER	L1 OR COMMAND RESPONSIBLE FOR REPORTING	2011 ACCIDENT SUMMARY	DATE
1	C Air Force	During preparation for Air intercept Missile (AIM) 120 Advanced Medium Range Air-to-Air Missile (AMRAAM) removal, tail fin was dropped and dented. NOTE 1	2011-06-03
2	C Air Force	While installing fins on missile, fin dropped off missile, struck tarmac and was dented. Attributed to Human Error (inadequate technique). NOTE 1	2011-06-21
3	C Air Force	Laser Guided Training Round (LGTR) dropped during loading operations. Technician failed to conduct step 2 of checklist. NOTE 1	2011-06-28
4	C Air Force	LGTR dropped while preparing to unload the LGTR. LGTR had failed to drop during flight. Attributed to Undetected Progressive Breakdown. NOTE 1	2011-06-28
5	C Air Force	LGTR dropped from rack during upload to aircraft. Crew failed to follow checklist. NOTE 1	2011-06-30
6	C Air Force	LGTR dropped on ground during loading operations. Attributed to undetected progressive breakdown. NOTE 1	2011-08-23
7	C Air Force	On the Job Training (OJT) technician incorrectly installed the connector for the Drogue Catapult Deployment Cartridge, resulting in damage to connector and cartridge. Supervising technician did not notice incorrect installation. NOTE 1	2011-10-25
8	C Army	Ammunition salvage returned to ammunition compound by a CANSOFCOM unit was being inspected/ sorted. Returning unit had failed to remove all skin pacs and components. M60 Igniter functioned when removed from skin pac detonator assembly. Technician received minor injury.	2011-01-17
9	C Army	Member received unspecified hearing damage when exposed to the concussion from firing of 84mm in adjacent trench. Member was not wearing hearing protection.	2011-02-19
10	C Army	Member's hand severely mangled by mortar round — member was acting as loader. Deliberate Deviation on part of supervisor who assigned the task knowing member was not trained for task assigned.	2011-02-26
11	C Army	Candidate threw grenade, but failed to clear protective wall and grenade fell back into bay. Safety member removed both candidate and himself to cover. No injury, but second grenade (left in throwing bay) was damaged and was later destroyed in situ.	2011-04-13
12	C Army	After firing 35 rounds, then 5 rounds at semi-automatic during second serial, bolt broke and upper receiver and magazine were damaged. Attributed to bore obstruction (dirt in barrel).	2011-04-30
13	C Army	Member was hit in the eye by a paint ball round. Member was incorrectly wearing ballistic eyewear.	2011-05-11

SER	L1 OR COMMAND RESPONSIBLE FOR REPORTING	2011 ACCIDENT SUMMARY	DATE
14	C Army	During instruction on how to properly use an artillery simulator, a student pulled the igniter cord at an angle, causing the igniter to separate from the fuse. Approximately 10 seconds later, a staff member picked up the igniter, at which time it activated, causing minor burns.	2011-05-19
15	C Army	Member was in waiting bay of grenade range when shrapnel ricocheted and entered member's collar. Member received minor burns, but skin not broken.	2011-05-30
16	C Army	A 60mm Smoke WP projectile was inserted into a mortar tube, but became stuck one third of the way down. Primary cartridge was not struck. Efforts to dislodge it were unsuccessful and tube was destroyed by Ammunition Section on advice of Wpn Tech. Suspect obturating ring slipped out of position, causing jam.	2011-06-13
17	C Army	Student fired paraflare in safe direction under instructor supervision. Paraflare flew 3m into air, flew into the ground, then struck bystander in the arm. Flare then fell to ground and ignited. Bystander suffered first and second degree burns.	2011-09-01
18	C Army	Light Machine Gun (LMG) C9 was experiencing stoppages and member decided to change barrels. After barrel change, stoppages continued. Member cocked weapon, placed on safe and opened the feed tray. Round on bolt face cooked-off. Member received superficial facial injuries.	2011-10-01
19	C Army	Subsequent to stoppage of C9, firer conducted stoppage drills and notified Assistant Range Safety Officer (ARSO) of situation. Firer noticed a round partially protruding from the breech. Before he could close the feed cover, the round cooked off, hitting the ARSO in the thigh with shrapnel.	2011-11-20
20	C Navy	Failure to correctly secure ready use pawl allowed a clip of two 57mm Blind Loaded and Plugged (BLP) rounds to fall out of the hopper, striking the deck. One round dented, other had partial case separation.	2011-02-03
21	C Navy	AM2 hoist arm failed to lower, causing projectiles to become wedged between rocker arm and gun frame. One round dented, other had case scoring.	2011-02-03
22	C Navy	Exercise Torpedo (EXTORP) was dropped during helicopter sortie, apparently without incident; however, there were no indications of weapon activation on entering water.	2011-02-19
23	C Navy	Marker Man Overboard (MMOB) lug was damaged by member using jump ladder. In attempting to better secure MMOB with rope, member caused it to fall off brackets and activate.	2011-03-12
24	C Navy	While pumping bilge into barge, MMOB was struck by a line, which caused it to discharge.	2011-03-22
25	C Navy	During gunnery serial, one round of 76mm Target Practice Tracer (TPT) became jammed in the feed system. System was reset and round again jammed, then became separated.	2011-06-16
26	C Navy	When firing .50 cal with blank rounds, Blank-Firing Attachment (BFA) fell into the sea. Suspect BFA bolts sheared, deformed or came loose during firing.	2011-06-20
27	C Navy	Accidental Discharge of one round 5.56mm by member of boarding party while in hangar. Round struck deck and ricocheted into helicopter hydraulic power unit.	2011-06-23
28	C Navy	Malfunction in gun system caused separation of projectile from cartridge case.	2011-08-27
29	C Navy	During boarding, a boarding party member was climbing a ladder when his weapon contacted the ladder, releasing the magazine, which fell into the sea.	2011-09-17
30	C Navy	When removing time-expired MMOB, member mistakenly removed MMOB from its bracket (did not remove it in its bracket), thus arming it.	2011-10-12

SER	L1 OR COMMAND RESPONSIBLE FOR REPORTING	2011 ACCIDENT SUMMARY	DATE
31	C Navy	During ammunition embarkation a 76mm TPT round was dropped onto the deck and the cartridge case was damaged.	2011-11-08
32	C Navy	While craning off, the hoist clamp frame sling assembly broke, causing the clamp to rotate into contact with the missile canister, causing minor damage. Assembly had been installed incorrectly.	2011-11-16
33	C Navy	Driving band damaged and projectile case separation occurred when a round was extracted subsequent to a loss of power to the servo on a 76mm Super Rapid Gun Mount (SRGM).	2011-11-21
34	CANOSCOM	During re-palletizing, a box was found with a label stating it had been dropped. Box contained Computer Missile-Bomb Guidance.	2011-03-22
35	CANOSCOM	Civilian Ammunition Technician slightly wounded during disposal by functioning operations on time-expired Signals Distress Day and Night. Poor functioning technique cited.	2011-08-26
36	CANSOFCOM	During a vehicle contact demonstration shots were fired from inside a van, breaking the van window. One member was injured by window fragment.	2011-05-22
37	CEFCOM	Door gunner lost 9mm weapon and holster when Dillon gun dislodged it from his vest. Deficiency in holster mounting identified. NOTE 1	2011-01-05
38	CEFCOM	Fragmentation grenade exploded in camp, injuring 2 personnel. Reported as though grenade fell from tactical vest. Supposedly both safety features came off in vest pocket.	2011-02-18
39	CEFCOM	During passenger loading, a weapon discharged inside the cabin, piercing the aircraft ramp. NOTE 1	2011-02-22
40	CEFCOM	Ammunition box was shaken from frame, then fell from ramp and exited aircraft. Identified a requirement for a secondary means of securing ammunition box. NOTE 1	2011-03-06
41	CEFCOM	During range practice, member injured when the rocket motor of the M72 he was firing exploded. Attributed to build up of mud/dirt due to lack of proper seal (weapon had been opened, closed, then continued to be part of squad load).	2011-03-25

NOTE 1 Originally reported in FSOMS.

NOTE 2 Greyed out cells indicate deliberate deviations.

Appendix 2 to Annex D

Incident Summary for the Year 2011

Incidents. The following table summarizes incidents that occurred in 2011. Greyed out cells indicate a deliberate violation.

SER	L1 OR COMMAND RESPONSIBLE FOR REPORTING	2011 INCIDENT SUMMARY	DATE
1	C Air Force	Technicians failed to disarm AIM-7 missile prior to release of aircraft to Quick Reaction Alert Area (QRA). Error found next day during pilot walkaround. NOTE 1	2011-01-07
2	C Air Force	Load sling snapped — support wire for the bomb hoist sling snapped while loading Hot Torpedo (HOTTORP). Attributed to undetected progressive breakdown and poor technique, in that operator caused sling to bounce. NOTE 1	2011-01-08
3	C Air Force	Pilot conducted overhead break over airfield while aircraft was carrying inert Guided Bomb Unit (GBU) 12 aircraft bomb. NOTE 1	2011-01-11
4	C Air Force	Damaged ARD 863 cartridge (groove around the primer) found during unpacking and verification of item returned from Salina FAC. Attributed to improper technique (not correctly torqued). NOTE 1	2011-01-13
5	C Air Force	During seat removal, the seat man separator actuated. Crew had not installed an initiator safety pin and had not lock wired the striker operating lever. Attributed to improper technique and inadequate supervision. NOTE 1	2011-01-19
6	C Air Force	Mk 46 Exercise Torpedo failed to function due to sheared lanyard. Attributed to improper length of arming wire (cut too long at CFAD) and failure of technician to measure wire. NOTE 1	2011-01-19
7	C Air Force	20mm received from Canadian Forces Ammunition Depot (CFAD) as Stock Handling Code (SHC) 10 was found to be same ammunition previously returned as SHC 70, requiring 100% inspection.	2011-01-28
8	C Air Force	Aircraft flew with time-expired hoist squib. NOTE 1	2011-02-04
9	C Air Force	Nine time-expired Markers Location Marine (MLM) were discovered in Search and Rescue (SAR) Armament Storage Rack Paul Bunyan. NOTE 1	2011-02-04
10	C Air Force	Mk 46 Exercise Torpedo malfunction caused by failure of drogue chute to release. Failure attributed to undetected progressive breakdown (system error). NOTE 1	2011-02-10
11	C Air Force	During Ship Helicopter Operating Limitations (SHOL) Evaluations, a jettison weight fell free from one of the loaded HOTTORP. Attributed to undetected progressive breakdown. NOTE 1	2011-02-11
12	C Air Force	Improper transportation, storage and control of time-expired cartridges. NOTE 1	2011-02-28
13	C Air Force	During live parachute sequence, top popped off of LUU2 flare prior to it being deployed. NOTE 1	2011-03-02
14	C Air Force	Runaway Gun. After firing an initial burst, trigger was released but gun kept firing. Operator jammed gun by twisting ammunition belt. Cause undetermined. NOTE 1	2011-03-02

SER	L1 OR COMMAND RESPONSIBLE FOR REPORTING	2011 INCIDENT SUMMARY	DATE
15	C Air Force	Uncommanded chaff/flare release. Investigation attributed incident to corrupted mission computer software (undetected progressive breakdown). NOTE 1	2011-03-09
16	C Air Force	MHU-141 trailer convoyed without bonding strap. NOTE 1	2011-03-10
17	C Air Force	GBU-12 Inert bomb failed to guide, landing 104m from target. Cause undetermined. NOTE 1	2011-03-11
18	C Air Force	Aircraft flown with incorrect documentation — records showed chaff and flare loaded when none were loaded. NOTE 1	2011-03-17
19	C Air Force	During disposal by mutilation of empty containers, one container was found to contain two impulse cartridges. Failure of returning unit to properly inspect and clear containers.	2011-03-17
20	C Air Force	Ejection seat left armed. Condition was not noticed by ground crew member during towing. Attributed to pilot error and inadequate training of ground crew member. NOTE 1	2011-03-29
21	C Air Force	Three live CADs found mixed in with expended CADs. NOTE 1	2011-04-12
22	C Air Force	Two contractors entered range area while range was booked for weapons release. Attributed to error by Range Safety Officer (RSO) in not leaving the range flag up during lull. NOTE 1	2011-04-13
23	C Air Force	Subsequent to misfire on Explosive Ordnance Disposal (EOD) Range, RSO called in 7 minute wait time, during which take-offs and landings in vicinity were to cease; however, aircraft activity carried on. Investigation revealed Air Traffic Control (ATC) personnel were unaware of restrictions. Local orders updated. NOTE 1	2011-04-14
24	C Air Force	Inadvertent release of chaff/flare. Pilot activated sill flare dispense switch, thinking system was in standby mode, when system was actually in bypass mode. NOTE 1	2011-04-21
25	C Air Force	Loaded aircraft (LUU2Bs) was parked in a non-designated area between hangars. NOTE 1	2011-05-18
26	C Air Force	Survival Kit Air Droppable (SKAD) thruster arming wire was left attached to rack during download training, causing thruster to fire. Supervisor with checklist was interrupted and returned to wrong line of checklist. NOTE 1	2011-05-30
27	C Air Force	Aircraft dropped three GBU-12 bombs. All three were lased from other aircraft. Two landed on target. Third landed short 220 metres. Investigation revealed one aircraft had set wrong laser code. NOTE 1	2011-06-07
28	C Air Force	After flight SAR Tech disarmed and returned three C2A2 MLMs to their original containers, but failed to revise expiry date tag. Notification of requirement had not been passed to end user due to poor internal processes. NOTE 1	2011-06-13
29	C Air Force	Maintenance personnel discovered a fourth C-8 Smoke Drift Indicator on aircraft — aircraft armament status sheet indicated only three. NOTE 1	2011-06-13
30	C Air Force	Gun was found on hangar floor in unsafe condition — cocked. NOTE 1	2011-06-15
31	C Air Force	When chaff and flare trailer was delivered to squadron load personnel, technicians discovered load consisted of mix of ALE 29 and ALE 47. ALE 29 is obsolete and no longer used on the CF18. NOTE 1	2011-06-16
32	C Air Force	LGTR dropped to ground during unloading of a hung bomb. NOTE 1	2011-06-23

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33	C Air Force	Prince Rupert Coast Guard reported presence of quantity 22 C2A1 MLMs at their helicopter hangar at Prince Rupert. MLMs had been provided on an allotment by CF, then lost track of.	2011-06-23
34	C Air Force	Aircraft was unloaded, moved and refuelled while in armed state. Countermeasures Dispensing System (CMDS) safety pins were not installed during the after landing checklist. NOTE 1	2011-07-01
35	C Air Force	During download of aircraft (AC) Search Stores, it was discovered that 15 LUU2Bs were fitted with CADs, not Storage Adapter Devices (SADs). Attributed to poor technique and inadequate reasoning. NOTE 1	2011-07-11
36	C Air Force	Improper convoy procedures — route not properly secured during convoy operations. Attributed to inadequate risk management and expectancy of no traffic. NOTE 1	2011-07-15
37	C Air Force	While conducting pre-installation fuze inspection, safety pin and roll pin fell out of fuze. Attributed to manufacturing defect.	2011-07-19
38	C Air Force	Aircraft flown with time-expired tow severance mechanism squib. Investigation later revealed item was not expired, but inappropriate data entry caused item to appear so in electronic records. NOTE 1	2011-07-19
39	C Air Force	Shielded Mild Detonating Cord (SMDC) line tip found bent. Suspected condition existed since installation in 2006. Attributed to poor technique. NOTE 1	2011-08-08
40	C Air Force	Breakdown in communications led to overflight of live fire small arms range. NOTE 1	2011-08-08
41	C Air Force	Aircraft with SAR load was parked in an unapproved location. Aircraft commander failed to mention SAR load was on board. NOTE 1	2011-08-15
42	C Air Force	SMDC line found damaged — tip not aligned. Attributed to improper technique during installation. NOTE 1	2011-08-31
43	C Air Force	During unloading of gun, the gun appeared jammed. Once rounds were extracted, one round was found to have been pierced. Attributed to improper timing of Universal Ammunition Loading System (UALS) interface. NOTE 1	2011-09-02
44	C Air Force	During Hot Seat/Hot Refuelling, outgoing pilot forgot to replace seat pins prior to exiting aircraft. NOTE 1	2011-09-06
45	C Air Force	After transportation of a pump kit from a Coast Guard station, it was discovered that an expended MLM had been placed into the pump kit container. Aircrew were unaware of MLM. MLM had been recovered and returned by RCMP. Errors attributed to both Coast Guard and RCMP. NOTE 1	2011-09-13
46	C Air Force	Aircraft flew training mission in unarmed state. Attributed to error by pilot. NOTE 1	2011-09-21
47	C Air Force	SMDC line discovered bent. Attributed to poor technique during installation. NOTE 1	2011-09-22
48	C Air Force	Cache of demolition explosives found on EOD Range in two ammunition boxes.	2011-10-03
49	C Air Force	SMDC line found damaged by repeated contact as technicians walked along the right hand side of the Leading Edge Extension (LEX) and used the canopy for balance. NOTE 1	2011-10-04
50	C Air Force	AIM 9 missile found in QRA with damaged fin cup. Technicians had failed to notice damage. NOTE 1	2011-11-04
51	C Air Force	Catapult damaged by improper installation by technicians. Damage found during removal. NOTE 1	2011-11-07
52	C Air Force	Ejection seat pin was not properly installed on rear ejection seat. Noticed during flight. Attributed to error on part of last rear seat pilot and missed during Maintenance Thru-flight Inspection. NOTE 1	2011-11-20
53	C Air Force	Loss of pen flares was discovered when pilot vest was turned over to Aviation Life Support Equipment (ALSE) Shop for maintenance. Attributed to error on part of pilots. NOTE 1	2011-11-21

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54	C Air Force	On departure, helicopter overflew an ammunition storage area. NOTE 1	2011-11-23
55	C Air Force	Rear ejection seat pin found in Canada Flight Supplement (CFS) holding box and not installed. NOTE 1	2011-11-29
56	C Air Force	Aircraft carrying Dangerous Cargo Class 1 was parked on a Designated Location; however, Net Explosives Quantity (NEQ) exceeded licence. NOTE 1	2011-11-30
57	C Air Force	Aircraft carrying Dangerous Cargo Class 1 was parked on a Designated Location; however, NEQ exceeded licence. NOTE 1	2011-11-30
58	C Air Force	Mk82 bomb failed to detonate on impact. Investigation revealed load crew had failed to swage the lanyard. NOTE 1	2011-12-01
59	C Air Force	Flare kit and flares were discovered to be time-expired during ALSE inspection. Items were being tracked in Integrated Management Plan (IMP) database as part of 500 hour inspection (not separately) and when inspection date was extended, flares time-expired. Now being separately tracked. NOTE 1	2011-12-05
60	C Air Force	Crew member failed to check ordnance load prior to departure. As a result, two expired MLMs were only discovered on aircraft during first exercise event. NOTE 1	2011-12-08
61	C Air Force	SMDC line found bent. Attributed to inappropriate technique at time of installation. NOTE 1	2011-12-13
62	C Air Force	Aircraft was flown with maintenance pins (including ejection seat and MDC firing unit) installed. NOTE 1	2011-12-14
63	C Army	Contractor recovered drum magazine of small arms ammunition (SAA) from chemical toilet.	2011-03-06
64	C Army	Pyrotechnics were used in an out-of-bounds area used as a landing surface, creating Foreign Object Damage (FOD) hazards.	2011-03-28
65	C Army	Fuzes returned from user were being inspected when they were found to have scratches and dents consistent with the use of unauthorized tools. In addition, fuzes had been over-torqued.	2011-04-15
66	C Army	As garbage was being transferred from dumpster to aggregation bin, a bag ripped open, releasing loose Blank rounds. Ammunition Section was called in to sort through garbage and found more SAA and range scrap from expended pyrotechnics. Items were both US and CF.	2011-04-27
67	C Army	Grenade Hand Smoke was recovered from skateboard park by Military Police (MP), then turned over to Ammunition Section.	2011-04-30
68	C Army	Unauthorized range clearance (post-firing range sweep?) conducted by unit. Range scrap was stored in main base and contained Live and suspect items.	2011-05-05
69	C Army	Personnel living in Personnel Married Quarters (PMQ) area were arrested by RCMP subsequent to setting off military pyrotechnics in the PMQ yard. Grenade Hand Smoke Screening L83A1 was recovered from inside PMQ.	2011-05-07
70	C Army	Unit reported a dud 81mm landed 25 metres from base plate.	2011-05-10
71	C Army	Military Police Detachment in Kingston received call from Kingston Municipal Police to pick up military ordnance. Detachment picked up item, a 25 pounder smoke — base ejection (25 Pdr Smk BE), transported it in service vehicle and retained it in MP lines. Later it was again transported and turned over to Ammunition Section.	2011-05-13
72	C Army	Member found Grenade Hand Smoke while doing garbage sweep near Base Headquarters (HQ). Item had been abandoned, not thrown.	2011-05-16

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73	C Army	During unit sanctioned adventure training, member removed a 105mm propelling charge 7 from his backpack with the intention of using it as a fire starter. Item was confiscated.	2011-06-07
74	C Army	Grenade Hand Fragmentation recovered from an amnesty box. Both safety features still in place.	2011-06-15
75	C Army	An accounting deficiency of one Grenade Hand Fragmentation was discovered. MP investigation conducted. Attributed to poor unit control.	2011-06-23
76	C Army	Anonymous report of misuse of pyrotechnics led to local investigation. Various pyrotechnics involved. Disciplinary procedures underway.	2011-06-27
77	C Army	While inspecting a newly arrived vehicle, employee opened a storage box and discovered a box of 8 electric blasting caps.	2011-07-05
78	C Army	Charge Demolition C4 recovered from an Amnesty Box.	2011-07-07
79	C Army	Blank ammunition, 5.56mm, found in member's kit during airport screening.	2011-07-13
80	C Army	Member was arrested for driving while impaired. Police noticed 25mm TPT round in his vehicle and seized it.	2011-07-27
81	C Army	EOD called to local residence to recover Simulator Projectile Ground Burst. Owner found pyrotechnic by his fish pond.	2011-08-30
82	C Army	Multiples of Thunderflashes were found taped together in the training area. In each bundle, one Thunderflash had functioned without sympathetically causing others to function. Tampering.	2011-09-09
83	C Army	3.5 inch rocket was found along a highway near Virden Manitoba and transported to the Virden RCMP. RCMP informed MP, who informed the Explosives Disposal Flight. Through low resolution pictures, the item was identified as Free From Explosives and MPs were requested to collect the item. Land Force Western Area (LFWA) Joint Operations Centre (JOC) was not informed of the EOD call. Improper EOD and transportation procedures.	2011-09-14
84	C Army	Heavy Logistics Vehicle Wheeled (HLVW) intercepted at gate to ammunition compound with load that had severely shifted. Some 155mm projectiles had toppled and some 105mm rounds had slid from their containers. Unit had not secured the load.	2011-10-21
85	C Army	Range Control personnel discovered multiple pyrotechnic items within an admin area in which no ammunition or pyrotechnics are to be used. This was a case of abandonment by a unit.	2011-10-25
86	C Army	Ammunition section member discovered blank rounds and expended blank cartridge cases on the ground beside the vacuum at a local carwash.	2011-11-05
87	C Army	Various items of pyrotechnics and SAA were found abandoned at Stewart Crossing Gate. Discovered by Range Control patrol.	2011-11-07
88	C Army	Range Control reported finding a 105mm Short Range Target Practice Discarding Sabot — Tracer (SRTPDS-T) round abandoned. Ammunition section recovered round, which was marked "Damaged" on the side. Centering band had been damaged. Unit did not report damage or abandonment.	2011-11-09
89	C Army	While conducting a receipt inspection subsequent to EX MAPLE RESOLVE three containers of 7.62mm Blank Linked ammunition were discovered from a lot never issued to Wainwright. Attributed to cross-country transportation by rail without proper documentation. Control/transportation issue.	2011-11-09
90	C Army	Service member discovered a Cartridge 40mm Practice Colour Marking that had been discarded alongside the base's health trail.	2011-12-06

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91	C Army	Misuse of Amnesty Box. Box overflowed due to large quantity of packaged SAA.	2011-12-09
92	C Army	During return of kit from an individual returned from Afghanistan, a C13 fragmentation grenade was discovered inside a tactical vest. Grenade lot had never been issued at that base.	2011-12-19
93	C Navy	Hot work (needlegun) conducted within 2m of magazine.	2011-01-20
94	C Navy	During disembarkation of salvage and ammunition, ship's staff were emptying storage containers of fired brass when live ammunition being disembarked was confused with the salvage and began to be unpacked. Attributed to poor communication.	2011-01-25
95	C Navy	One Diver Recall found on top of a cabinet after divers completed return of their dive gear.	2011-02-04
96	C Navy	During de-ammunitioning, member carrying fraction box of live ammunition (20mm) placed box into triwall of salvage. Magazine Yeoman noted error and moved box to appropriate area. More detailed safety briefing to be given in future.	2011-02-24
97	C Navy	Subsequent to ammunitioning, three crew members left CFAD jetty for gravel area adjacent to jetty, then began to light a cigarette.	2011-03-09
98	C Navy	Sixteen rounds and two magazines of 9mm ball lost into sea during transfer of member between two ships. Attributed to carelessness of member. Items were recovered from sea floor.	2011-03-10
99	C Navy	Time-expired MMOB discovered on board and returned to CFAD. May have been expired when issued, due to misunderstanding of Lot Number.	2011-03-11
100	C Navy	Sixteen Super Rapid Blooming Offboard Chaff (SRBOC) Rockets and 9 Sonobuoys partially submerged in magazine due to leak in fire suppression system. Possible damage to one SRBOC.	2011-04-14
101	C Navy	Electrical cable and conduit for a deck light was found to have been installed in a small arms magazine. Similar condition exists in sister ships.	2011-05-12
102	C Navy	During pyrotechnic demonstration, member fired Paraflare without a secure hold. Item fired at 90 degrees, turned towards ship's centreline, but did not hit ship or crew. No evidence flare deployed/ignited.	2011-05-16
103	C Navy	Twenty-seven kilograms of Dummy C4 (bronze colour) were returned to CFAD for disposal. CFAD noticed white coloured material in package. Investigation revealed white material was inert C4 that should not have been returned in this package. Further investigation showed white material was not registered on unit Dummy and Display Register. White inert C4 probably a locally purchased item — without proper authorization.	2011-06-02
104	C Navy	During ammunition embarkation, member of ship's staff was smoking at the edge of the jetty.	2011-06-06
105	C Navy	While de-arming ship, a Signal Distress Day/Night was found in the night signal box. A full muster was conducted, during which a signal from a non-issued lot was found in a diver's pack. Total excess one signal. Signal suspected to have been brought aboard without authorization.	2011-06-06
106	C Navy	Lookout deployed one C2A2 Smoke Marker and armed a second. Second was not used and was returned to container still in armed state. Discovered by Senior Naval Weapon Technician (NWT).	2011-07-06
107	C Navy	During stocktaking shortage of 9mm Ball was traced to an issue of a box quantity. RSO had allowed usage of entire quantity and not limited usage to authorized amount. Control issue.	2011-07-16
108	C Navy	Improper storage of pyrotechnics noted during Fleet Ammunition Inspector (FAI) inspection of a frigate boat transit pack.	2011-07-26

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109	C Navy	While member was being hoisted from water into aircraft, a Day/Night Flare (day end expended) fell from an immersion suit pocket into the water and was lost.	2011-08-17
110	C Navy	Thirty rounds of 5.56mm ammunition discovered in Hazardous Material (HAZMAT) locker near to amnesty box. Amnesty Box would not hold quantity and unknown trainee (RAVEN program) placed ammunition in HAZMAT locker.	2011-08-25
111	C Navy	Two separate incidents of SAA lost into the sea: the first when a loaded magazine was lost and second when a loaded magazine fell to the deck, releasing one round which rolled overboard.	2011-09-05
112	C Navy	Irving Shipbuilding discovered SAA taped above a light fixture in the small arms magazine. Ammunition turned over to MP.	2011-09-12
113	C Navy	Post firing cleaning and maintenance revealed a hair line crack just below the bevel of the extractor spindle of a 40mm L60. Technical investigation ruled out ammunition as cause; however, investigation continues concerning excess muzzle flash.	2011-10-04
114	C Navy	As a result of late inclusion of petroleum products into disaster relief packages and due to misunderstanding of storage separation regulations, petroleum products were stored too near to ammunition on board ship.	2011-10-18
115	C Navy	During disembarkation of Vertical Launch System (VLS), VLS Tech failed to verify isolation of power to missile module, resulting in activation of magazine deluge system.	2011-11-14
116	C Navy	Lookout armed MLM when a person was reported overboard, but did not throw it due to a false alarm. Lookout took the armed MLM into the bridge and left it on the Naval Communications (NAVCOM) desk.	2011-11-22
117	CANOSCOM	Transport incident. End caps came off containers on three separate pallets and some of the contents exited the containers.	2011-04-06
118	CANOSCOM	Destruction of Thunderflashes was being prepared on six destruction points (DP). Fifteen minutes from placement of last box in DP6, spontaneous initiation of Thunderflashes began due to residual heat from previous day's burning of packaging materiel at same DP. Only 20 hours, not the specified 24, had elapsed since previous burning operations.	2011-07-28
119	CANSOFCOM	From Significant Incident Report (SIR): Quantity of C13 Fragmentation Grenades reported deficient during stock verification. MP investigation determined the grenades were stored in unsealed ready use boxes positioned in guard towers, but could not determine when they were put there or when they went missing (on location over several rotations).	2011-07-16
120	CANSOFCOM	Jacketed portion of frangible SAA failed to separate.	2011-10-14
121	CEFCOM	Inadvertent flare release within confines of airfield. Aircrew failed to disable Missile Approach Warning System (MAWS) system on approach. NOTE 1	2011-03-08
122	CEFCOM	Aircraft captain failed to set Aircraft Survivability Equipment (ASE) system to SAFE for final approach. Aircraft experienced MAWS indication and fired flares in vicinity of adjacent ramp. No damage. NOTE 1	2011-04-14
123	CEFCOM	Servicing crew began refuelling aircraft when de-arming was in progress. NOTE 1	2011-04-22
124	CEFCOM	Unintended discharge of one round during unloading of jammed M134 Dillon gun. Attributed to Human Error (technician did not remove feeder/delinker) and inadequate training/supervision. NOTE 1	2011-06-08
125	CEFCOM	On short final to landing, aircraft had a MAWS indication and flares were ejected in the vicinity of an adjacent ramp. Pilot had forgotten to SAFE the ASE system. NOTE 1	2011-06-08

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126	CEFCOM	During monthly inspection a round was found in a barrel of a M134 Dillon gun. Round was Dummy. Attributed to undetected progressive breakdown due to repeated cycling. NOTE 1	2011-06-10
127	CEFCOM	Stoppage of M134 Dillon gun could not be cleared in flight or on ground. Investigation in weapons shop attributed damage to undetected progressive breakdown caused by excessive heat and accumulation of carbon which caused expended round not to extract. NOTE 1	2011-06-10
128	CEFCOM	Aircraft bomb was dropped under laser guidance, but missed target. Fall/explosion was not observed. Investigation revealed laser had been set to training mode, hence lack of guidance. NOTE 1	2011-06-16
129	CEFCOM	Two members were found guilty of mailing weapons and ammunition from theatre back to Canada. Reports taken from newspapers.	2011-06-20
130	CEFCOM	Aircraft flew with improperly seated missile fin. Investigation revealed previous flight had taken place in same condition. Attributed to undetected progressive breakdown. NOTE 1	2011-06-23
131	CEFCOM	During loading of aircraft, AIM-9 missile contacted launcher, resulting in scraped missile fin. Missile was replaced and later repaired. NOTE 1	2011-06-28
132	CEFCOM	Member was processing salvage returned from a Forward Operating Base (FOB) when a partial paraflare assembly functioned in close proximity to his face.	2011-07-20
133	CEFCOM	Improper storage of 20mm ammunition: UALS had both High Explosive Incendiary (HEI) and Target Practice (TP) rounds. NOTE 1	2011-08-12
134	CEFCOM	Aircraft flew mission with Bidirectional Forwarding Detection (BFD) safety wires still in position. Attributed to improper technique by load crew and failure to cross-monitor. NOTE 1	2011-09-05
135	CEFCOM	Aircraft was refuelled in an armed state. Attributed to improper technique and constrained working conditions. NOTE 1	2011-09-14
136	CEFCOM	Aircraft flew initial bombing mission without current functional testing (outdated by 5 weeks) required by mission load. NOTE 1	2011-10-02
137	MILPERSCOM	Twelve inch length of Cord Detonating found jammed in mouth of Amnesty Box.	2011-01-20
138	MILPERSCOM	During sorting of salvage return, two dud artillery simulators were found in an opaque bag among expended pyrotechnics.	2011-05-27
139	MILPERSCOM	During sorting of unit salvage return, CFAD staff found two dud pyrotechnics mixed in with expended pyrotechnics. Items were in bags with signed Free From Explosives (FFE) certificates. Drivers of vehicles were not qualified to transport dangerous goods.	2011-06-02
140	MILPERSCOM	While sorting unit salvage return, a dud as well as a partially functioned Thunderflash were found in a sealed bag. FFE tag had been signed by Unit Ammunition Representative (UAR), not RSO.	2011-08-08
141	MILPERSCOM	London police dismantled WWII mortar bomb in private residence (CF EOD not called).	2011-12-13

NOTE 1 Originally reported in FSOMS.

NOTE 2 Greyed out cells indicate deliberate deviations.

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