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DAER – ANNUAL REPORT

A REVIEW FROM 1 JANUARY TO 31 DECEMBER 2010

Director Ammunition and Explosives Regulation

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

Canada

Cover Image

Corporal Dan Perry, from 423 Squadron, Shearwater, Nova Scotia, wheels a MK 46 Torpedo off the flight deck of Her Majesty's Canadian Ship (HMCS) Fredericton on 22 November 2009.

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EXECUTIVE SUMMARY

The third 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 2010 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.

The third annual report builds on the first two reports in the continuing effort to portray how well the DND/CF is self-regulating under its exemption from the *Explosives Act*. As in the previous reports, this report examines key areas such as: policy development; compliance verification of selected activities in the A&E life cycle; development of A&E safety related training; advocacy activities; and trend analysis of A&E accidents and incidents.

In 2010, the A&E compliance verification program utilized a multifaceted approach to assess the A&E life cycle with a special and deliberate focus on environmental issues impacting the disposal of A&E. A review of the state of A&E related infrastructure suggested a need to rationalize the National Inventory Control Point (NICP) of A&E holdings from first to third line to allow the subsequent prioritization of much needed A&E infrastructure investments. The management of A&E stocks awaiting disposal and evolution of the Demilitarization Capability Project are receiving senior leadership attention and must remain a focus in the coming years. Operational safety was closely monitored during the last year and will continue to evolve in the coming months as mission transition in Afghanistan gets underway. The compliance verification of the DND UXO and Legacy Sites Program has highlighted a process rated as "excellent." The Inventory Control and Accountability verification identified that while the process in place meets policy requirements, a number of observations should be addressed to improve the state of supply discipline.

The A&E compliance program of work in the next two year timeframe will focus on evaluating the effectiveness of the DND/CF Ammunition and Explosives Safety Program (AESP) by reviewing the first round of A&E Safety Surveys (AESSs) and analyzing root causes of non-compliance with AESP related policies. Furthermore, follow-up compliance activities will be conducted in four areas: A&E safety in operations; progress of the demilitarization project; Avalanche Control; and the in-Service Surveillance program development.

In the area of policy development, DAER focused its program of work on the completion of the first tranche of the core A&E publications which included: Volume 1 (A&E Program Management and Life Cycle Safety); Volume 2 (Storage and Facility Operations); Volume 5 (Deployed Operations); and Volume 7 (Certification of Ammunition, Explosives and Accessories for Service Use). Furthermore, completion of Ammunition and Explosives Instruction 11 (Disposal of A&E at End of Life Cycle) and the new risk management framework in 2011 will address all policy areas which were listed as either red (policy does not exist) or yellow (policy exists, but requires revision or substantial clarification) from the first two annual reports.

In 2011–2012, policy development will focus on the production of the second tranche of the new safety program volumes to include: Volume 4 (Demilitarization and Disposal); Volume 6 (Naval Vessels); and Volume 8 (Construction Standards). A review of DAOD 3002-0 (Ammunition and Explosives) and DAOD 3002-1 (Insensitive Munitions) will also be undertaken. Finally, work within the NATO area of Allied Joint Doctrine for A&E safety planning and risk management will continue in tandem with the development of related CF joint doctrine.

AESP development continued in 2010 through production of promotional products including posters, bulletins and the release of two safety videos. In an effort to increase reporting, Ammunition and Explosives Instruction 30 (A&EI 30) was released to provide a simplified method for reporting accidental small arms discharges. Lack of DND resources regarding information technology support resulted in delays in the development of distance learning courses for both the Unit Ammunition Representative (UAR) and the Unit Explosives Safety Officer (UESO) courses, two crucial elements for the furtherance of AESP governance.

There was a significant increase in the reporting of A&E occurrences in 2010, which is well above the 10 year average. This rise was predominantly attributable to a sharp increase of CAS accidents and incidents and is indicative of a high tempo of force generation and force employment activities, as well as a lack of expertise which is being addressed by the re-introduction of the Air Weapons System Technician. Reporting from both CEFCOM and CLS is still not what would be expected in light of the pace of operations and training. The majority of incidents and accidents are the result of human error (72%) with deliberate deviations increasing from a 10% average in the first two annual reports to 15%. In the vast majority of cases, A&E worked as designed with no injuries or deaths due to ammunition faults.

The AESP program of work in 2011–2012 will include: 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 standards; further development of educational and promotional products (including a safety video); 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 ADM(IM) will undertake review of the Ammunition and Explosives Safety Information Management System (AESIMS) business processes in order to scope out the resources needed in order to meet the requirements related to the first five priority modules.

The report concludes with a qualitative assessment of where DND/CF presently stands with respect to the A&E safety agenda. The assessment tailored several of the key elements of the Treasury Board Management Accountability Framework (MAF) to the ammunition program in order to identify strengths and weaknesses. The following MAF assessment elements were chosen:

- Governance and Strategic Direction;
- Policy and Programs;
- People;
- Risk Management; and
- Stewardship.

In assessing the ammunition program's regulatory and safety performance against the five assessment elements selected from the MAF, the overall rating is that opportunities remain for improvement in virtually all areas. The only activity assessed as "Attention Required", (signifying there is inadequate attention to a significant deficiency) relates to the development of the IT tools required for the safety and regulatory program. AESIMS is viewed as a technology enabler for the entire program and so it is imperative that this initiative receive the required attention.

In all other areas, the deficiencies can be categorized as moderate and there is evidence of attention being paid at the appropriate level. As a core component of DAER's program of work, the various initiatives will continue to be tracked to ensure continued progress by the DND/CF in meeting its self-regulatory requirements under its exemption from the *Explosives Act*. Furthermore, as processes and tools in support of the ammunition program continue to mature, DAER will examine options for providing an enhanced quantitative rating in relation to A&E safety and regulatory compliance for future reports.

SECTION 1

INTRODUCTION

A CC-130 Hercules aircraft releases flares.

The third 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 2010, an overview of the main activities from the regulator's office, as well as the planned activities in the next two-year cycle (2011–2012) in order to continue moving the A&E regulatory and safety agenda forward.

In similar fashion to the first two reports, the main body of the report, 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 the first two 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 in 2011–2012;
- **A&E Policy Framework** – This section provides an update on policy development, with emphasis on areas identified as yellow and red in the first two annual reports as well progress on the development of a new policy hierarchy for increased coherence with the A&E life cycle. Projected policy development for 2011–2012 is also included; and
- **A&E Safety Advocacy and Analysis** – This section contains the A&E accident and incident analysis of 2010 in comparison to previous years. Further, safety and advocacy program development is covered, including the development of electronic tools for use in 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 analysis of progress to date by adapting several elements of the Management Accountability Framework to ammunition program regulatory and safety issues. It is hoped that this approach 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

Gunner Jordan Gunther prepares 105mm High Explosive artillery rounds for a direct fire engagement against tank targets, in Shilo in March of 2008.

Background

The Ammunition and Explosives (A&E) compliance program focused on the following four themes in the 2010 program of work:

- Following up on the progress of past verification activities, previously reported in 2007–2008 and 2009 annual reports;
- Formal DAER A&E compliance verification visits and activities of selected processes of the A&E life cycle disclosed in DAER's annual coordination letter to the L1 organizations;[1]
- Important precursor work in support of the development of new policies; and
- Review of L1 A&E specialists' inspections and compliance verifications to ensure completeness, consistency and appropriate consideration of associated risks.

In addition to carrying out the compliance program, supporting documentation was developed in order to provide clearer standardized compliance verification processes. New analytical tools (such as A&E Safety Surveys) will also be used in the future, in conjunction with this framework, to provide a more accurate assessment of the Department's A&E compliance.

[1] 1300-1 (DAER 4. RDIMS LSTL #1891249) DAER Compliance activity coordination 2010/2011 dated 23 August 2010

A&E Compliance Program of Work for 2010 – Progress of Past Verification Activities

Deployed Multinational Operations

General – Although most NATO countries have ratified the use of Allied Ammunition Storage And Transportation (AASTP-1), Manual of NATO Safety Principles for the Storage of Military Ammunition and Explosives and AASTP-5, NATO Guidelines for the Storage, Maintenance and Transport of Ammunition on Deployed Missions or Operations, the persisting lack of explosives safety co-ordination and planning creates overlapping storage sites, leaving individuals unnecessarily exposed to risk from accidents or unintended initiation of explosives stored in theatre. Particularly, the lack of coordinated site development, knowledge and understanding of safety distances and explosives safety co-ordination have led to encroachment of other land use potentially compromising safety distances to storage sites after these explosives storage sites were established.

Staff Assistance Visits – Several Staff Assistance Visits (SAVs) have raised concerns over a lack of a common approach to ammunition storage, transport and handling in Afghanistan. Similarly, a 2010 UK audit of explosives safety management in Afghanistan highlighted that the same lack of common safety standards was placing UK assets at risk.

The US Department of Defense Explosives Safety Board (DDESB) has conducted a gap analysis of US doctrine and has proposed a Chief of Joint Services Instruction to integrate Explosives Safety Munitions Risk Management requirements into planning and execution processes. The DDESB proposed that NATO methodology mirror the US approach and a gap analysis followed by a new Allied Joint Publication be developed. This effort has DND/CF's full support and DAER will be working collaboratively with the DDESB on moving this initiative forward within NATO.

Mission Transition and Surveillance – In preparation for mission transition and reduction in A&E stocks deployed to theatre, a surveillance program was implemented by DGLEPM/DAEME and CANOSCOM/J4 Ammo to determine the current state of deployed A&E stocks based on the environmental and operational factors to which they have been exposed. Initial results from the CANOSCOM/CMSG FG ISS TAV conducted 28 May–7 July 2010 indicated good chemical stability for almost all gun propellants analysed.

A team of Explosive Ordnance Disposal (EOD) experts from Camp Nathan Smith, home of the Kandahar Provincial Reconstruction Team (PRT), prepare munitions for a controlled detonation at Tarnak Range on November 2, 2008.

The 105mm Tank White Phosphorous Smoke ammunition was sentenced to a one year use and storage life and recommended segregated storage as the surveillance program results demonstrated it constituted a higher risk of auto-ignition. The remaining ammunition containing propellant was sentenced to a further five year use and storage life, at which point, the propellant will be retested to assess the possibility of life-extension. The inventory will continue to be monitored through testing and surveillance into 2011 by CANOSCOM/CMSG/J4 Ammo TAVs. The results, combined with initiatives developed and decisions taken by the Mission Materiel and Infrastructure Board (MMIB), will be used to determine which A&E can be safely returned to National inventory as well as identifying future sentencing criteria for training and operations.

Forward Operating Bases (FOB) – In preparation for mission transition some FOBs have been handed over to other Allies and A&E stockpiles at these sites have been reduced to minimal levels to support operations. As FOBs fully transition from CA ownership, stocks will be collapsed to the TNASP for inspection, reconsolidation, or disposal based on conditioning. It is essential that as mission transition activities progress, lessons learned from FOB activities during the Afghanistan deployment be captured, analyzed, and applied to future missions.

Technical Deployed Operations Training (TDOT) – As reported in the 2009 Annual Report, a TDOT package was produced and delivered to A&E specialists deploying as part of TF 1-10 and 1-11. As this training was found to be beneficial, it is imperative it continues by tailoring it to the operation being supported to ensure safety is maintained for all A&E activities.

HR Renewal

Canadian Ammunition Technical Officer (ATO) Course – In 2010, the Logistics Branch Integrator (LBI) conducted a feasibility study which aimed at exploring the possibility to conduct ATO training (academic and technical) in Canada in order to meet CF production requirements. The findings indicated a Canadian solution would not only resolve critical production shortfalls, but also prove cost effective. As a result, the LBI submitted a business case complete with a new draft Specialty Specification, Qualification Standard, and Training Plan for consideration and approval by CDA. While much work remains to be done before approval is granted, this initiative has the potential to resolve long standing ATO production shortfalls and deficiencies. The objective remains to deliver the first Canadian ATO course commencing January 2012 graduating in the fall from CFSAL.

The Advanced Ammunition Engineering PG – The Advanced Ammunition Engineering PG program continues to produce both military and civilian Ammunition Engineers for employment within the sponsoring organizations. In 2010, two military members and two civilians graduated. Currently, there are three students expected to graduate in 2011, with a further four graduates planned in 2012. The program is currently in the second year of a three year SLA between DGLEPM and RMC. The LBI is working to secure funding approval for a combined ATO/Ammunition Engineer program with the goal of starting the Canadian ATO program portion in 2012.

Ammunition Technicians (AT) – The AT occupation manning level has progressed significantly to a record high 85% fill rate (171 out of 201 positions filled), a net gain of 9% since the last report. The recruiting process introduced in FY 08/09 is paying dividends. For the past 2 years this occupation has met its Strategic Intake Plan forecast with 36 personnel recruited for training in this period. This year, increased emphasis will be applied to reducing the attrition rate currently at 9.2%, which is slightly higher than the CF average of 7.8%. It is anticipated the Preferred Manning Level (PML) will be reached by end FY 11/12.

The Civilian Ammunition Technician (CAT) – The CAT training continues to produce entry level technicians for employment in second and third line ammunition facilities. This program is the cornerstone of CAT succession planning for the years to come, has been well received and continues to mature. Returns from CMSG and CLS indicate they have respectively actioned 88% and 30% of the initial Prior Learning Assessment Reviews for their CAT personnel. CMSG and CLS are expected to meet the deadline of eighteen months for this review. The initial review of the CAT OS will be conducted by DAER and stakeholders in FY 11/12 with a view of identifying areas which require updating as well as those which may be re-classified as "just in time" vice core training requirements.

Air Weapons Systems Technician (AWS) – AWS training under the Occupation Enhancement-Air Technicians project will begin in early 2011 with 12 students on the pilot course, which should be completed before the end of the calendar year. Upon confirmation that the pilot course criteria meet and deliver all requirements, 24 to 36 students will be course loaded in the 2012–2013 training year, followed by a steady-state 48 per year. This rate will continue until such time as AWS growth achieves PML and production will then be adjusted downwards to maintain PML.

National A&E Storage Registers/Licenses

The number of licences requiring renewal continues to steadily reduce. As depicted in Table 1, only 23 out of 365 storage facility licences (6.3%) remain due for renewal (compared to 18% last year and 40% the previous year). The remaining licences will be finalized in 2011. This will allow the L1 ATAs to focus on the normal renewal of licences on a five year basis in accordance with established policy.

Table 1 Storage Licenses Requiring Renewal

COMMAND	UNIT	LICENCES REQUIRING RENEWAL
ADM(Mat)	METC Nicolet	6
CAS	CFS Alert	2
	3 Ere Bagotville	4
	4 Wing Cold Lake	1
	9 Wing Gander	1
CLS	CFB Montreal – Farnham	1
	CFB Valcartier	2
	LFCA TC Meaford	4
CANSOFCOM	DHTC	2

Safety and Suitability for Service (S^3)

The 2009 compliance verification of S^3 policies and processes resulted in a "Good" rating with 32 observations. Corrective action plans were submitted for all observations and significant work has subsequently occurred to implement those plans. Many corrective actions called for policy and/or process revision, which became the focus for 2010. DAER separated and revised S^3 policy from the present standard (D-09-002-010/SG-000 Assessment of the Safety and Suitability for Service of Ammunition and Explosives) for incorporation into the series of A&E Safety Manuals (C-09-005-007/TS-000 Certification of Ammunition, Explosives, and Accessories for Service Use). DAEME subsequently began revision of the standard and expects to complete this effort in 2011. The following update is provided for the observation themes detailed in the 2009 Annual Report:

- **Training** – DAEME is in the process of developing a formal training package for Qualified Ammunition Technical Authorities (QATAs) that should address identified deficiencies. This training may be incorporated into core A&E officer specialist training (ATO and Advanced Ammunition Engineering) and will be made available as a specialty course for other designated QATAs;
- **Awareness** – The Ammunition Safety and Suitability Board (ASSB) membership has taken on the additional workload required to actively promote S^3 requirements through briefings, correspondence, and documentation. This effort seems to have had the desired effect as projects and in-service managers now appear to be giving additional consideration to A&E certification requirements;
- **A&E Specialist Availability** – HR initiatives taken since 2008 have had a positive effect on this issue as there are now significant additional S^3 specialists available to act as QATAs. Additionally, to manage and coordinate QATA HR requirements better, DAEME created a project support section that consolidates a group of S^3 specialists, which should allow for better responsiveness to project and in-service S^3 requirements. However, the previously mentioned awareness efforts have resulted in increased QATA demand, which has once again outstripped specialist availability. DAEME will continue to monitor this situation; and
- **Lessons Learned** – DAEME has created a database to track Lessons Learned and will fully implement it in 2011. Additionally, the splitting of policy and process direction and the QATA training package should allow more reactive implementation of best practises.

Avalanche Control (AVCON)

The Canadian Forces participates with Parks Canada to provide AVCON services for the TransCanada Highway corridor in the Rogers Pass of British Columbia. Military participants under OP PALACI fire the 105mm howitzer high explosive shell to dislodge and bring down weak layers of snow at a chosen time and place, thereby protecting the public from the risk of unplanned events (avalanches).

A Memorandum of Understanding covering these AVCON activities is due for renewal prior to the 2011/2012 season, and Canada COM has the lead in negotiations. A working group led by Canada COM and including representatives from DAER, DAEME and CANOSCOM/J4 Ammo met twice in 2010 to discuss the renewal parameters. Topics of discussion have included:

- Procurement practices leading to high ammunition stock levels held in AVCON storage magazines, and a possible safety impact on highway traffic, led to a discussion with Parks Canada and a decision to reduce the resupply order for the 2010/2011 season to more closely match expected requirements;
- An environmentally-driven prohibition on the burning of gun propellant directly on the ground led DAER to promulgate an instruction on the recovery of unused propellant observing explosive safety, environmental and dangerous goods regulations and principles;
- Parks Canada legal ownership of the howitzer ammunition purchased from DND was confirmed. Legality of Parks Canada re-selling some of this military pattern ammunition for use by the BC Ministry of Transport avalanche control program remains under review; and
- DND is responsible under the Explosives Act for the management of unexploded military ordnance throughout Canada, regardless of its source. To fulfill this obligation, in 2010 the DND UXO and Legacy Sites Program performed UXO search and destruction services in the Rogers Pass area. Effectiveness of the UXO response is hampered by the lack of accurate records, and record-keeping will become an eventual topic of discussion with Parks Canada.

Sergeant Stéphane Gauvreau and Bombardier Kevin Guy engage an air target with the Air Defence Anti-Tank System (ADATS), Call Sign (C/S) 22A, at range X-21, CFB Suffield, during Exercise POTENT KNIGHT in November 2007.

A&E Technical Orders

Steady progress has been made on this issue, originally reported in the 2007/2008 report. DAEME completed priority categorization of all A&E CFTOs in 2010 and began correction of Priority one (safety concerns) and two (high urgency, use, or demand). By year end, 10 of 33 Priority one and 23 of 24 Priority two CFTOs requiring revision remained. To accelerate the revision process with the aim of completing these CFTOs in FY 11/12, DAEME plans to make use of a recently negotiated Technical Investigation and Engineering Studies (TIES) contract with GD-OTS. As CFTOs are subject to Controlled Technology and Transfer (CTAT) regulations, under DAOD 3003-0 Controlled goods, electronic technical data on networks have been restricted to authorized personnel only. All DND personnel (employees, members and embedded contractors) are required to have a Secret clearance to access ITAR covered technical data and must complete the CTAT online learning by 31 December 2011. DAER will continue to monitor in 2011.

AESP Implementation

Based on a review of annual A&E Safety Inspection reports, bases appear to be actively improving and in some cases implementing their AESP. While A&E Safety is still not as well established as General or Flight Safety programs, the increased visibility resulting from this revitalization seems to have given A&E specialists some increased influence to rectify deficiencies and enforce compliance with policies and regulations.

What is lacking throughout virtually all L1 organisations is a top down approach from Command for AESP implementation. The majority of activities to date have been from the bottom up at unit and base level. This issue will be further examined in the Compliance Verification Program in 2011–2012.

Demilitarization

Stockpile levels of obsolete and time expired A&E requiring demilitarization and disposal continue to be maintained in ammunition facilities. DCOS (Mat) has addressed the disposal of obsolete and time expired A&E by assigning a task to DGLEPM/DAEME to plan and execute the reduction of the A&E stockpile as quickly and economically as possible with a view of establishing a steady state disposal capability for both recurring and non-recurring natures. The implementation of the execution phase of the reduction plan should commence by fall 2011.[2] CANOSCOM/CMSG continues to address the disposal of Munitions Scrap (MS) via CF Demilitarization Capability Project #00001101. DGLEPM/DAEME and CANOSCOM/CMSG plan to examine the inclusion of additional capability that could benefit both disposal of A&E and MS. Since the 2009 Annual Report, the stockpile of MS has increased by 500 short tons as a result of UXO clearance operations within civilian scrap yards, and re-classification of inert, non-energetic components generated by authorized demilitarization processes at CFADs. Holdings of deteriorated/obsolete A&E were reduced by 4,400 short tons as a result of:

- Changes to stock conditioning within the Ammunition Disposition Request (ADR) process to more accurately categorize A&E within the life cycle process; and
- Removal of obsolescence/disposal sentencing based on further engineering assessments which saw natures such as 20mm ammunition (approximately 800k rounds) return to Air Force Inventory reclassified as serviceable inventory.

In 2010, disposal consisted of approximately 16 short tons of various ammunition natures. This quantity represents a relatively small percentage of disposal activity if compared to the total quantity of ammunition that has been disposed of in the last four years (510 tons).

[2] DGLEPM Planning Guidance-A&E Disposal (RDIMS LSTL #2200146-v2) dated 20 December 2010

A&E Compliance Program of Work for 2010 – from the Annual Compliance Letter

CF Ammunition Infrastructure

In DND's 2010–2011 Report on Plans and Priorities, the importance of improving the overall condition of infrastructure was highlighted as one of the important pillars of the Canada First Defence Strategy (CFDS). The report highlighted that approximately 50% of the Defence realty asset inventory (35,000 buildings and work assets) is over 50 years old. Overall, the CFDS aims to replace 25% of existing infrastructure over 10 years and 50% over 20 years. This will also result in divestment of infrastructure that becomes unnecessary or that cannot be economically recapitalized.[3] With this as the backdrop, it was decided to progress the initial ammunition infrastructure survey from 2009 through a series of site visits (Table 2 below) and survey completion through respective L1 ATAs. The aim of the survey was to examine present conditions of infrastructure writ large, capacity for the safe storage of stocks, restrictions due to encroachment of exposed sites and adequacy of realty development planning to ensure that A&E infrastructure is adequately considered in the context of CFDS renewal.

Table 2 Locations of the Compliance Verification Visits

COMMAND	LOCATIONS
CANOSCOM/CMSG	CFAD Dundurn
CLS	CFB Edmonton, CFB Wainwright
CMS	CFB Esquimalt
1 Cdn Air Div	14 Wing Greenwood

Note: CFB Shilo, 5 ASU Saint-Jean Detachment Farnham, 9 Wing Gander, 3 Ere Bagotville, 19 Wing Comox, 5 Wing Goose Bay, 17 Wing Winnipeg and 8 Wing Trenton provided additional information via survey completion through the responsible L1 ATAs.

The compliance verification activity generated thirteen observations and eight recommendations. A detailed report regarding the current state of CF Ammunition Infrastructure has been issued to stakeholders for review and development of corrective action plans.

Summarily, over the years, it appears DND/CF has not provided a priority for the necessary planning relationship between ammunition requirements derived from estimates that consider training needs and expected usage in on-going and contingency operations, or the logistics infrastructure that is required to support and sustain these requirements. As a result, the following issues were observed:

- The majority of the ammunition facilities surveyed are ageing and several of them are showing signs of possible structural integrity issues;
- Buildings that were part of the survey are far from being used to their physical or licence capacity;
- Little or no preventive maintenance, betterment or capital investments seems to be occurring on A&E facilities;
- It is difficult to predict how structural degradation of facilities will have an affect from a safety perspective. In particular, adequacy of protective structures (barricades, protective roofs, 3 and 7 Bar igloos) could be compromised and pose an unacceptable risk to the safety of personnel;
- Less than 50% of the Civil Engineer staff surveyed were either familiar with the content of C-98-001-003/MS-003 Siting Manual or even aware of its existence; and
- Although most units have plans (capital projects) to replace A&E facilities, there was no evidence of rationalization based on ammunition program requirements or training and operational needs.

Due to the importance infrastructure plays in the delivery of services, lag between A&E inventory requirements and infrastructure construction will lead to mismanagement of storage space available and will impact the overall safety and efficiency of the Ammunition Program. DAER will conduct further analysis of the responses to the survey in order to provide the current situation of A&E infrastructure across all Commands. However, further rationalization of A&E infrastructure requirements can only be undertaken with the establishment of Depot to first line rationalization of required holdings through the National Inventory Control Point (NICP) concept and distribution of A&E stocks at first, second and third line to best support CF training and operational activities. DAER will work collaboratively with CANOSCOM and the various L1s through the Ammo Board to ensure the establishment of an agreed-to distribution plan in 2011–2012.

[3] Department of National Defence Report on Plans and Priorities 2010–2011

Table 3 Scrap Yard Cleanup Locations for 2010

LOCATION	TOTAL TONNAGE REMOVED	SUSPECT ITEMS SAFE TO MOVE FOR DISPOSAL
National Salvage, Lethbridge, AB	498.8 tons	39 Note: Table 4 lists those items which required further disposal action
Intercity Salvage, Medicine Hat, AB	263.3 tons	0
13029 Range Rd 70 Cypress County, AB	71 tons	0
Gas City Metals, Dunsmore, AB	29.1 tons	0
Total Tonnage	862.2 tons	

The DND UXO and Legacy Sites Program

The 2009 DAER Annual Report stated that a compliance verification visit would be performed on a UXO and Legacy Sites Program active site. Initially, a site at Tracadie, NB was to be the focus of the verification. Delays and limited activities on the site led to a change of venue. After further discussions on possible alternative sites with the DND UXO and Legacy Sites Program, DAER refocused its objective on scrap yards, specifically on a designated active site at Medicine Hat, AB. Considering that scrap yards represent a special and challenging setting, the examination of the various processes would clearly showcase the current evolution of the DND UXO and Legacy Sites Program. Table 3 above identifies scrap yard clean-up locations and tonnage recovered in 2010.

The assessment was broken into three elements with various requirements: A&E Safety, impact on the Ammunition Program, and Policy framework of the DND UXO and Legacy Sites Program. Overall, the Program's processing and re-screening of MS previously disposed of through sale to scrap yards, prior to the current departmental moratorium, received an excellent rating by meeting all A&E safety requirements detailed in policies and regulations. The compliance verification activity raised eleven observations. The major themes of the observations include:

- **Representation at a Site** – The dual representation of Explosives Safety Officer (ESO) and Quality Assurance (QA), present at an inspection "out debrief" to the civilian contractor enhanced efficiency by complementing each other;
- **Positive Approach in Addressing Safety Issues** – DND UXO and Legacy Sites Program representatives conducted thorough Safety and QA assessments on the civilian contractors in a cordial and positive fashion;
- **Care of the Environment** – Defence Construction Canada (DCC) representatives demonstrated the due diligence approach taken by the DND UXO and Legacy Sites Program regarding environmental considerations. Work plans addressed the concerns about endangered species and reflected good environmental mitigation measures such as, soil removal, vegetation removal as well as soil protection, atmosphere and air mitigation measures, protected areas, and identification of possible species at risk;
- **Increased Vigilance** – As the number of active sites increase, an accrued vigilance by the DND UXO and Legacy Sites Program will be required regarding ways civilian contractors' personnel are employed, emerging technologies that could facilitate disposal of UXO in urban settings, as well as the financial process used in compensating temporary dislodgement of civilian population due to UXO removal; and
- **Policies** – As the DND UXO and Legacy Sites Program is evolving, DAER must ensure policy interpretations continue to be provided in a timely fashion and refinement of policies is in step with that evolution.

A report containing a detailed account of this compliance verification activity has been provided to ADM(IE) for review. DAER intends, in the coming years, to conduct a complementary compliance verification to assess the process used in managing UXO on active ranges.

Table 4 Items Found in Lethbridge, AB

DESTRUCTION TRACKING CODE	NAME	FILLER	NEQ
UXO-LA001	105mm Illum Cannister – Partial	Pyrotechnic	1.79kg
UXO-LA002	105mm Illum Cannister – Partial	Pyrotechnic	1.79kg
UXO-LA003	105mm Illum Cannister – Partial	Pyrotechnic	1.79kg
UXO-LA004	Smoke Unit A/T Mine Prac L1A2	Pyrotechnic	193.5g
UXO-LA005	Smoke Unit A/T Mine Prac L1A2	Pyrotechnic	193.5g
UXO-LA006	Smoke Unit A/T Mine Prac L1A2	Pyrotechnic	193.5g
UXO-LA007	2" Mortar – Smoke	Pyrotechnic	500g
UXO-LA008	2" Mortar – Smoke, Partial	Pyrotechnic	200g
UXO-LA009	105mm Smoke Cannister	Pyrotechnic	365g
UXO-LA010	81mm Mortar – Partial	High Explosive	84g
UXO-LA011	2" Mortar – Smoke	Pyrotechnic	500g
UXO-LA012	84mm HEAT FFV65, Partial	High Explosive	500g
UXO-LA013	Fuze, A/T Mine – MK1/1	High Explosive	0.4g
UXO-LA014	2" Mortar – Smoke	Pyrotechnic	500g
UXO-LA015	Smoke Unit A/T Mine Prac L1A2	Pyrotechnic	193.5g
UXO-LA016	105mm Smoke Cannister	Pyrotechnic	365g
UXO-LA017	Flare – Helicopter Ground Illum	Pyrotechnic	119.4g
UXO-LA018	Grenade, Hand Smoke Screening	Pyrotechnic	235g
UXO-LA019	84mm HEAT FFV65, Partial	High Explosive	500g
UXO-LA020	2" Mortar – Smoke	Pyrotechnic	500g
UXO-LA021	2" Mortar – Smoke	Pyrotechnic	500g
UXO-LA022	84mm HEAT FFV65, Partial	High Explosive	500g
UXO-LA023	155mm HE Projectile – Partial	High Explosive	112g
UXO-LA024	High Explosive Filler – Loose	High Explosive	670g
UXO-LA025	84mm HEAT – T, Partial	High Explosive	500g
UXO-LA026	High Explosive Filler – Loose	High Explosive	140g
UXO-LA027	155mm Illum candle	Pyrotechnic	3.5kg
UXO-LA028	Smoke Pot 5 Min L1A1 – Partial	Pyrotechnic	2kg
UXO-LA029	Smoke Pot 5 Min L1A1 – Partial	Pyrotechnic	2kg
UXO-LA030	Simulator Gunfire – Flash and Sound	Pyrotechnic	12g
UXO-LA031	Projectile 76mm APC – T	Inert	65g
UXO-LA032	Projectile 76mm APC – T	Inert	65g
UXO-LA033	Smoke Pot 5 Min L1A1 – Partial	Pyrotechnic	2kg
UXO-LA034	High Explosive Filler – Loose	High Explosive	50g
UXO-LA035	Fuze, Time and Percussion No. 63	High Explosive	1g
UXO-LA036	76mm Smoke Cannister – Partial	Pyrotechnic	110g
UXO-LA037	30mm HE, w/o fuze	High Explosive	40g
UXO-LA038	Fuze, Powder Train Time	High Explosive	1g
UXO-LA039	30mm HE, w/o fuze	High Explosive	40g

Inventory Management and Accountability

The A&E inventory of the DND/CF is estimated at approximately $3 billion. As it contains attractive commodities, it is subject to stringent controls from both a security and accounting perspective. Within the Canadian Forces Supply System (CFSS), accountability is defined as the obligation on the part of the person(s) entrusted with the custody of materiel to maintain an accurate record, automated or manual, of materiel holdings. In the CFSS, all supply stocks are accounted for, until they are expended or declared surplus to requirements and subsequently disposed of through established CFSS procedures.

The Materiel Accountability Strategy and Action Plan Briefing to the Defence Supply Chain Conference of 19 January 2009 indicated that 75% of bases could not show an audit trail for materiel adjustments. In addition, 7050-36 (CRS) Audit of Inventory Management: Stocktaking, Adjustments and Write-offs identified shortcomings in timely and accurate submission of materiel adjustment transactions in support of contractor-held inventories as well as second and third line warehouses. As a result, it was decided a portion of the 2010 DAER Compliance Verification Program would focus its attention on A&E accounting and inventory management across the three elements through the use of questionnaires and interviews with users at the unit level. Table 5 displays a snapshot of the health of those processes.

Overall, three major themes were addressed:

- Use of Allocation Module within the Ammunition Inventory Management System (AIMS) (the allocation of A&E within AIMS is required to enable units to draw their training allocations from their 2nd line support facilities);
- Support to A&E logistics functions of pre-deployment training and major training exercises to ensure A&E post-exercise drills and accounting, such as ammunition account close-out procedures, availability of repackaging material, ammunition trained personnel for repackaging and movements personnel were considered in the planning process to allow for timely and accurate reconciliation of A&E holdings to support follow-on activities; and
- Timely submission of supply adjustment transactions upon expenditure of A&E to ensure accurate accounting of A&E stocks held within the National Inventory at all levels of support.

The review found that although the L1s are meeting the general requirement of Inventory Management and Accountability, increased vigilance is needed in the areas of A&E management in support of operations as well as for the timely submission of adjustment transactions. Failure to improve in these areas can, and likely will, lead to erroneous reporting of both surpluses and deficiencies within the Departmental accounting framework and could create a situation where DND/CF would not be in a position to demonstrate adequate accounting control to the public for what is essentially a dangerous and attractive commodity.

A&E Compliance Program of Work for 2010 – Additional Compliance Activity in 2010

Air Force Air Weapons Handling

In 2010, the Air Force published a major revision to B-GA-297-001/TS-000 Safety Orders for Canadian Forces Air Weapons Systems that removed and integrated the Air Weapons Safety Program into A-GA-135-001/TS-000 Flight Safety for the Canadian Forces. B-GA-297-001/TS-000 now clearly defines the Air Weapons Handling Program, which supports the objectives of both the Air Weapons Safety and Explosives Safety Program.

A significant modification stemming from this revision is increased oversight by 1 Cdn Air Div A4 Maint, following similar procedures to those defined in the Explosives Safety Manual. Designated Areas (DA) licenses used for airfield operations were previously approved by the applicable Wing/Base Commander and did not expire, resulting in a loss of situational awareness by 1 Cdn Air Division. While the approval authority for DAs remains with Wing/Base Commanders, they are now only valid for a five year period and copies must be sent to 1 Cdn Air Div / A4 Maint.

To implement this policy change and reduce risks, A4 Maint staff has begun a verification of DAs. The process is divided into two concurrent projects. The first project is the review of all currently licensed airfield DAs. Wings have until 31 March 2011 to renew any DA license older than five years and A4 Maint staff will perform an audit to ensure all licenses are in compliance with B-GA-297-001/TS-000. The second project will be a review of NORAD Quick Reaction Area (QRA) facilities DAs. Not all facilities are in compliance

Table 5 Inventory Control and Accountability – Overall Elemental Ratings

DATA POINT	OBSERVATION	REQUIRED ACTIONS	CMS	CLS	CAS
Understanding of Allocation System	Units did not receive allocations in quantities to support actual requirements. Units based requirements on historical trends rather than accomplishment of mandated training.	All personnel involved in A&E management receive, at a minimum, local briefings from the Operations & Training staffs explaining how allocation is arrived at for both Individual and Collective Training and that any perceived shortfalls be addressed during quarterly meetings.			
Use of AIMS	Full potential of AIMS Allocation Module not being utilized, which leads to cumbersome A&E approval methods being implemented.	Units FY A&E allocation to be input into AIMS no later than 30 April each FY. Allocate down to SCA or UA levels so that no further "approval" is required to draw A&E other than support facilities confirmation in AIMS at time of issue that unit has sufficient allocation to satisfy demand.			
Support to A&E Logistic Functions	Not enough emphasis or support given to A&E supporters at end of Major Exercises to allow for accurate, timely accounting of exercise A&E stocks within Post Exercise Drills. In some instances, months passed before completion of required supply documentation took place, resulting in $100K erroneous CF 152 reports.	Exercise orders must include direction on use, accounting, and return requirements for A&E. Sufficient time and human resources must be made available to process unused/returned A&E at the end of an exercise. No accounts should be cleared by adjustment transaction until all A&E stocks have been recovered and accounted for. Ensure proper quantities are deployed. Normally 60-80% of A&E deployed was returned unused.			
Training of Unit A&E Personnel	Approximately 50 % of UAR and SCA Holders have had no training in A&E accounting procedures.	This will improve with introduction of a Distance Learning package for UAR over next 24 months. Recommend that more specific supply accounting training be given to those SCA Holders who have A&E on their inventories. Training should focus on timely submission of adjustment transaction post A&E use as well as on methods of reporting use within the unit to support adjustments.			
Timely Submission of Adjustment Transactions	Extended periods between adjustment transaction submission leads to incorrect accounting processes being applied to administer SCA balance discrepancies.	Adjustment transactions to remove A&E from holding accounts to be submitted within 7 days of consuming A&E in training. Adjustment transactions in support of major exercises (pre-deployment training) be submitted within 14 days of the end of an exercise and not before completion of post ex drills to ensure all A&E has been properly accounted for. Close out routines should be addressed at final Logistics meetings/exercise. End of exercise orders, and support staffs must hold units accountable up to end of close out process to ensure A&E is properly accounted for.			
Certification of A&E Adjustment Transaction by SCA Holders	Current supply regulations allow for SCA Holders to certify their own adjustment transactions. Without a formal, auditable document support system in place this could result in unsupported adjustments being input to the CFSS.	Recommended that formal amendment of CFSS policy be made that stipulates all A&E adjustment documents are supported by a Range Clearance Certificate or equivalent form, signed by an independent source accounting for actual expenditure of the A&E other than the SCA Holder, to ensure that the SCA Holder is not the only link in the audit trail. This document will be used to support the SCA Holders adjustment document to remove the expended A&E from the account. This will ensure a degree of separation for the individual demanding, issuing, and removing A&E from accounts. DAER will work with DMPP to develop appropriate wording for Supply Manual amendments.			

Inadequate Needs Improvement Meets Requirement

A Navy vessel fires an air defence missile.

with B-GA-297-001/TS-000 and are licensed under the authority of the MND via a message issued in 2001.[4] This review will validate potential waiver situations and allow risk mitigation plans to be implemented.

Ammunition and Explosives Safety Survey (AESS)

During the 2009 annual A&E safety conference, DAER staff highlighted deficiencies with the present methodology used to perform A&E Safety Inspections and suggested a number of revisions to the process. Rationale for the change included reduced dependence on an individual inspector's knowledge of A&E safety requirements, adopting a common approach implementable by all L1 ATAs, enhancing visibility to commanders at all levels as to the level of compliance with A&E Safety requirements, and simplified trend analysis.

DAER began development of the AESS in 2010. The process focused on providing a questionnaire resulting in a scored evaluation of a base, CFAD, or fleet's compliance with A&E Safety requirements. The resultant score coupled with past performance (as it is generated) will be used to determine the timing of subsequent A&E Safety Inspections. Higher scores would increase time between inspections; while lower scores would result in more frequent inspections. Base/CFAD/fleet results will be rolled up to permit DAER to provide L1s with an evaluation of A&E Safety compliance writ large.

The AESS process was trialed by all L1s in the summer and fall of 2010 during their regular A&E Safety inspections. The trial intent was to identify errors, omissions, and oversights and provide DAER an estimation of the impacts of implementing the revised process. Results were positive and the process was refined based on trials. Initial results indicated a relatively small number of significant A&E safety issues.

Due to the success of the trial and in order to provide all bases sufficient time to become familiar with the AESS process, DAER plans to introduce the revised AESS beginning in April 2011 in advance of the release of the A&E Safety Manual Volumes. Implementation will be limited to carrying out the survey of all bases, CFADs, and fleets. Low scores will not initially result in increased inspection frequencies, but may see reduced frequencies for exceptionally high scores. An A&EI will be issued in order to roll out the AESS process implementation.

A&E Compliance Program of Work for the Years 2011 and 2012

General – The program of work in 2011–2012 will concentrate on the continued follow-up of critical on-going issues from previous years. A compliance verification on the state of the AESP will be the only new selected process from the A&E life cycle to be reviewed with the emphasis on:

- Objective evaluation of the effectiveness of the DND/CF AESP by conducting a review of the first round of AESS results and subsequently working collaboratively with the various commands to improve their respective AESPs;
- Analyzing root causes of non-compliance with AESP-related policies; and
- Identifying areas requiring corrective action.

[4] CDS T13 132145Z SEP 01

On-Going Issues – The following issues will be covered:

- **A&E Safety in Operations** – With the closure of Joint Task Force Afghanistan, DAER will continue to monitor A&E Safety in operations during the disposition in-theatre and safe re-deployment of A&E to Canada, identify possible lessons learned driven from this deployed operation, and examine the evolution of the establishment of a NATO A&E Safety methodology via a new Allied Joint Publication to promote a multi-national risk management process;
- **Demilitarization** – With the emergence of important environmental considerations impacting on the methods of disposal currently available, DAER will continue to ensure surplus, obsolete, deteriorated, and excess stock is monitored and the accumulated materiel does not constitute an A&E safety hazard. Progress of the Ammunition Demilitarization Capability Project will also be tracked;
- **Avalanche Control (AVCON)** – With the upcoming implementation of a renewed MOU between Parks Canada and DND about Rogers Pass AVCON, DAER will continue to assist and advise Canada COM on the implementation of the MOU from an A&E perspective and will pursue issues linked to additional AVCON activities in the province of British Columbia involving civilian contractors and large calibre guns, and the lack of military oversight. Concerns about civilian qualifications, sourcing of military pattern ammunition, tracking and management of UXO, and the possibility of unknown contaminated legacy sites resulting from previous AVCON firing programs will also be investigated by DAER;
- **Past Compliance Verification** – DAER will follow up on the observations relating to the compliance verifications of the CF Ammunition Infrastructure, Inventory control/ Accountability; and
- **In-Service Surveillance Program** – DAER will continue working with the respective stakeholders to ensure data obtained during operations are incorporated into the departmental in-service surveillance program and the required policy documentation is adhered to once issued.

Summary

In 2010, the A&E compliance verification program utilized a multifaceted approach in assessing the A&E life cycle with a special and deliberate focus on environmental issues impacting the disposal of A&E (refer to Policy Development, section 3 of this report). Directives at the strategic level will be required regarding the desired state of the infrastructure needed to support A&E operations. The management of A&E stocks awaiting disposal and evolution of the Demilitarization Capability Project received the required level of attention and will remain a focus in the next two years. Operational safety has been carefully monitored during the last year and will continue to evolve in the coming months. The compliance verification of the DND UXO and Legacy Sites Program has highlighted a process rated as "excellent." The Inventory Control and Accountability verification identified that while the process meets policy requirements, a number of observations should be addressed to improve the state of supply discipline.

Compliance activities in 2011 and 2012 will focus on monitoring the evolution of an increasing number of the key issues, including transition to newer policies and tools to assess more accurately the state and effectiveness of the AESP.

SECTION 3

AMMUNITION AND EXPLOSIVES POLICY FRAMEWORK

The Master Gunner sits in the door-gunner's position in the CH-146 Griffon helicopter and fires the new Dillon Aero 7.62mm M134 Minigun, during a training exercise at the firing ranges in the desert in February 2009.

Background

Orders and directives covering Ammunition and Explosives (A&E) policies, procedures and regulatory processes are essential for the safe conduct of operations, both domestic and deployed. The publications and instructions issued are designed to provide the L1 organizations with comprehensive source documents on all aspects of the A&E life cycle, from cradle to grave. Development of such far reaching policy is achieved through a collaborative process involving national stakeholders and taking into account international initiatives to foster interoperability and ensure compliance with accepted standards.

The work plan for 2010 aimed to build on the achievements of 2009; addressing the identified deficiencies in the current A&E Safety regulatory publications. Particular emphasis was placed on the following areas:

- Policy requiring immediate action in support of ongoing operations and that addresses situations where policy does not exist;
- Publication of Ammunition and Explosives Instructions (A&EIs) to provide timely distribution of critical information to the community; and
- Review and amendment of existing A&E publications.

A&E Policy Program of Work in 2010

General – The DAER A&E policy work in 2010 focused on the preparation of the new A&E Safety Manual publication series. This work will subsume many of the A&EIs that have been published which may be viewed as interim policy documents.

DAOD 3002-6 – Display Fireworks was published in 2010. This DAOD sets out instructions on display fireworks events conducted by DND employees or CF members as part of their employment or duties, and other persons acting under the direction of an authority having jurisdiction.

The new C-09-005-003/TS-000 – Volume 3 – Transportation was completed and sent for translation. It will be published in early 2011.

A&E Program Management Responsibilities and Accountabilities – CRS 2005 Evaluation of the DND/CF Ammunition Safety Program identified that A&E Safety personnel did not have accurate Terms of Reference (TOR), i.e. responsibilities and accountabilities, and that there was no system to access competency profiles. DAER is mapping ammunition program accountabilities to identify existing responsibilities and accountabilities for key A&E positions at Unit, Base and Command levels. Responsibilities and accountabilities will be a key component of C-09-005-001/TS-000 – A&E Program Management and Life Cycle Safety.

DAER established two additional TORs key to A&E in 2010. The existing generic ASSB TORs were refined for all ASSB members as part of the S^3 assessment policy CFTO creation. Additionally, the development of an A&E Life Cycle Materiel Manager (LCMM) TOR began in the fall of 2010. The focus of the LCMM TOR is to highlight those responsibilities specific to A&E Safety for which a LCMM is responsible. Following stakeholder consultation, this TOR was finalized for inclusion into Volume One of the A&E Safety Manuals.

Environmental Policy – DND/CF is mandated to maintain military readiness through training and at the same time comply with applicable environmental regulations. It must therefore seek to strike a balance between these sometimes competing requirements, including activities associated with the disposal of A&E.

1st Regiment Royal Canadian Horse Artillery Troop 1 prepares to test fire a 155mm M777 howitzer after airlifting the equipment to a new location within Afghanistan on 4 June 2010.

In order to take into account complex environmental considerations, optimize emerging demilitarization technologies and permit the DND/CF to self manage end of life cycle requirements, the dependency on Open Burning (OB) and Open Detonation (OD) as a primary means to destroy A&E must be re-examined and rationalized. While the environmental impact associated with the functioning of A&E in training to satisfy CF operational readiness is acceptable, the environmental impact associated with the routine life cycle demilitarization of A&E must consider alternate environmentally compliant technologies.

Because of these concerns, DAER has been working with Departmental partners including Materiel Group, CLS/DLE, DGE and DRDC to address the following areas:

- Identifying environmental concerns related to the disposal of energetic materials. This includes work required for the characterization of chemicals (National Pollutant Release Inventory), treatment operation (demilitarization) and estimation of emission rates;
- The integration and implementation of programs to achieve compliance; and
- Developing reporting and assessment methodologies for instituting clear and compliant disposal procedures, and to monitor overall environmental compliance performance.

The year 2010 was a pivotal one in addressing the environmental challenge with the focus of effort being on the development and implementation of the CF burn trays for the disposal of surplus propellant. It had been noted by DND/CF environmental agencies that the burning of propellant on the ground, regardless of containment on a concrete pad or not, has the potential to impact the environment. Damage could be caused by the leaching of contaminants contained in the propellant or its residue, such as 2,4-DNT (Dinitrotoluene) and lead, which have been measured in some areas at very high levels in the soil and ground water. In order to mitigate the environmental impact, research and development has been focused on the burn trays.

Testing of the trays has proved them to be very successful, reducing contaminant leaching into the soil and water table significantly. CLS/DLE has been fully engaged in the initiative and ADM(Mat) has funded the procurement of some 20 burn trays to be distributed throughout the Army, CANOSCOM CFADs and ADM(S&T) research centres. A&EI 29 (packaging and return of surplus gun propellant and propellant increments to ammunition facilities) was published by DAER in June 2010 giving direction on how to safely return the surplus propellant. A&EI 31 was also published in July 2010 to give guidance on how to dispose of surplus gun propellant utilizing the new burn trays. Further testing will be conducted by DRDC in March 2011 at CFAD Dundurn to determine if lead is released into the atmosphere. Additional testing on various propellant open burning emissions is also planned.

Trials were also conducted on the current burn set and the results showed that the railway flares were leaving detectable amounts of dioxins and furans (D&F) in the soil which could contaminate the water table. It was determined that the perchlorate in the flares was the source of the D&F. The ignition train has been modified by DAER and the new ignition system covered by A&EI 31 has eliminated the source.

A significant contributing factor to the challenge of achieving balance in environmental stewardship is the fact that environmental compliance can be complex and challenging when dealing with federal and provincial regulators and requirements. Ultimately, DAER intends to implement a systematic approach to achieving environmental compliance involving disposal of energetic materials.

EOD Doctrine and Policy – In 2010, the EOD Doctrine, Policy and Tactics Techniques and Procedures (TTP) Panel, of which DAER is a member, was established as part of the CF EOD WG to identify areas of EOD doctrine, policy and TTP that require improvement and to recommend actions. Particular areas of interest will be to synchronize concepts (strategic to tactical), review developing doctrine and policy and to recommend changes to TTPs.

OPRED Confirmation – During 2010, CF EOD remained the confirming authority for all C-IED teams on their road to high readiness training. This will be the case until the Centre of Excellence (CoE) for Train the Force has completed stand-up. The final transfer of responsibility to the CoE will take place in 2011.

IE/HME Training – In the last year, C-IED TF and DAER worked closely on defining aspects of a new Improvised Explosives/Home Made Explosives (IE/HME) training course in order to ensure that CF members are prepared to the appropriate level of knowledge and skill to meet the threat of Improvised Explosive Devices (IEDs) – the vast majority of which employ IE/HME. DRDC will play a key role in the development of the training package in order to ensure that this training is as safe as possible for all members. Courses are scheduled to begin in 2011.

A CF-188 fires CRV-7 rockets.

Synchronizing EOD and Ammo Incident Reports – Work to improve the synchronization of information in both EOD and Ammo Incident Reports was undertaken, specifically looking at a way to capture these reports in the Canadian Forces Range Information System (CFRIS). While EOD and Ammo Incident reports will continue to be reported and tracked separately, the use of common fields such as "Lot Number" will serve to support investigations. The intent for 2011 is that all EOD Initial Reports (IREPs) and EOD Final Reports (FREPs) will be digitized and logged into CFRIS and will be available for viewing to those departments that require access.

UXO – Work continued in conjunction with the DND UXO and Legacy Sites Program to develop complementary policy to support its operations. Included in this work was the DAER contribution to the final review process of B-GL-381-003/TS-000 UXO and Range Clearance Manual, and Standard 1606-4000.1-S02-020 Technical Instruction for Unexploded Explosive Ordnance (UXO) Activities.

Insensitive Munitions – The DND/CF ratified NATO Insensitive Munitions (IM) requirements in the 1990s. DAOD 3002-2 on the subject issued in 2004 is currently under review. The IM concept reduces A&E sensitivity to defined external stimuli, such as fire and typical modes of enemy attack, to increase platform and stockpile survivability and provide additional safety to personnel. Safety and Suitability for Service (S3) assessments assess stimuli reaction levels (referred to as the IM signature), however the DND/CF for various valid reasons has not yet embedded IM requirements into A&E procurement processes and has therefore not reduced risk. In 2010, the Ammunition Program Strategic Enablers Working Group (SEWG) reviewed present policies and the current state of IM technology incorporation into A&E designs and made recommendations for changes to DND/CF processes. This review was presented to and endorsed by the fall 2010 Ammunition Board.

International Policy – In an effort to improve safety on operations, DAER worked extensively with the international community to further develop guidelines and standards. This included frequent and highly-participatory attendance at regular meeting of NATO's Conference of National Armaments Directors (CNAD) Ammunition Safety Group meetings, meetings with key nations' regulatory staff, and attendance at the US DoD Explosives Safety Board (DDESB) international safety conference. Several papers were submitted and presentations made with the aim of producing standards which would be applied by all nations on deployed operations, thereby reducing risk and enhancing effectiveness of combined and joint operations.

Explosive charges are placed on the ground before detonation at the demolition range during Afghan National Army (ANA) training by the Operational Mentor and Liaison Team (OMLT) in Afghanistan in June 2009.

Of particular note is the importance of the bilateral agreement between DAER and its US sister organization, the DDESB, which includes collaborative work in developing A&E safety policy for both domestic and international use. This work includes a US initiative to conduct an analysis 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.

Policy Status

General – The first two annual reports presented the state of the major A&E publications in three categories: Red – policy does not exist, Yellow – Policy exists but requires revision and/or substantial clarification, and Green – policy exists and is deemed current. This year the same format is used and the current status of regulatory policy is shown below:

Red – Policy Does Not Exist:

- **Risk Management** – As reported last year, 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. The promulgation of this document will require the endorsement of assigned levels of authority for approving risk to be authorized by the publication of a DAOD following CDS and DM approval. The risk management model has been presented to international experts at the US Department of Defense Explosives Safety Board (DDESB) Conference and will shortly be incorporated into NATO guidelines for risk management on deployed operations;
- **Deployed Operations** – The final draft of Explosives Safety Regulations for Deployed Operations, C-09-005-005/TS-000 Volume 5 – Deployed Operations, has been completed. This volume will provide a single reference source for A&E safety on deployed operations. The shortfalls in the current regulations for fixed A&E facilities when applying them to deployed operations have been abundantly illustrated through the CF experience in Afghanistan and this publication will be released in 2011; and
- **Demilitarization** – A&E 11 provides interim policy for OB and OD operations. It is recognized that the initiatives currently underway within CANOSCOM/CMSG and DGLEPM/DAEME will provide a capability to meet Canadian demilitarization requirements and the development of related policies and procedures is underway to support this work.

By the end of 2011 all these areas will have been addressed through the publication of relevant policy and will be considered green.

Yellow – Policy Exists But Requires Revision and/or Substantial Clarification:

- C-09-153-001/TS-000 A&E Safety Manual, Volume 1, Storage and Transportation. This core document is outdated and will be replaced starting in 2011 by a series of C-09-005 publications specifically designed to address the needs of modern A&E Safety.

The restructuring of the core A&E policy documents will result in publications that better meet the requirements of the DND/CF and coincidentally be easier to keep up-to-date or amend. The new volumes are as per Table 1 below.

The promulgation of new publications in 2011 will take much of the policy currently reported as Yellow into Green with the bulk of the remainder being addressed in 2012.

Table 1 C-09-005-001/TS-000 Series

PUBLICATION NUMBER	DESCRIPTION	COMMENT
C-09-005-001/TS-000	Volume 1 – Ammunition and Explosives Program Management and Life Cycle Safety	To be published in 2011
C-09-005-002/TS-000	Volume 2 – Storage and Facility Operations (including storage related operations)	To be published in 2011
C-09-005-003/TS-000	Volume 3 – Transportation	To be published in 2011
C-09-005-004/TS-000	Volume 4 – Demilitarization and Disposal	To be published in 2012
C-09-005-005/TS-000	Volume 5 – Deployed Operations (encompasses FOB, Field, BLAHA and Risk Assessment)	To be published in 2011
C-09-005-006/TS-000	Volume 6 – Naval Vessels	To be published in 2013
C-09-005-007/TS-000	Volume 7 – Certification of Ammunition, Explosives and Accessories for Service Use	To be published in 2011
C-09-005-008/TS-000	Volume 8 – Construction Standards	To be published in 2013

A&E Policy Program of Work for the Years 2011 and 2012

DAOD 3002-0 – Ammunition and Explosives – This DAOD will be reviewed in 2011 to take into account any changes to DND/CF structure and assigned authorities that may have occurred since the latest version was published in 2006.

Work on a new DAOD in the 3002 series, Ammunition and Explosives Risk Management for DND/CF will be completed. 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 Department's level of risk in the annual report to the DM/CDS.

Work will continue to ensure that Volumes 1, 2, 3 and 5 of the new series of core A&E policy documents are published in 2011.

Insensitive Munitions – Work on IM for 2011–2012 will include the following:

- The SEWG will lead in revising DAOD 3002-2 and S^3 policy with respect to IM requirements and developing a compliance reporting framework;
- The Program Execution Working Group will request that VCDS include IM requirements in the project approval processes, and will lead in determining the IM signature of present A&E inventory and evaluating the cost of IM technology insertion into various A&E designs; and
- The Requirements Planning Working Group will monitor these activities and adjust future A&E funding planning accordingly.

A&E 11 – Demilitarization – This A&EI will be amended to address environmental concerns and republished as "Destruction by Open Burning (OB) and Open Detonation (OD)".

C-09-008-002/FP-000 – Work on the new version of the Duds and Misfires Ammunition on CF Ranges and Training Areas (RTA) will be completed. The publication is currently under final review and will be promulgated in FY 2011/2012.

Explosive Ordnance Disposal – Disposal of Stray Ammunition C-09-008-003/FP-000 is due to be updated and it is intended to distribute the document for stakeholder review at the beginning of FY 2011/2012.

International A&E Doctrine – The NATO A&E safety community has identified that there is a gap in doctrine with respect to the application of established A&E safety guidelines on NATO multinational operations. DAER will continue work to support a US initiative to conduct an analysis of NATO doctrine, amend existing publications and develop new AJPs to ensure that A&E safety issues are properly considered within NATO.

CF A&E Doctrine – Nationally, DAER will conduct 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.

Summary

Much was achieved in 2010 and the work on the first tranche of the core A&E publications is nearing completion. The review of existing documents will continue to ensure that they are kept current. Work in 2011 will see those areas of policy that have previously been reported as red move to green. The promulgation of new publications will also take much of the policy reported as yellow into green with the bulk of the remainder being addressed in 2012.

The contributions of L1s and external stakeholders are key to ensuring that the policy documents produced by DAER meet the needs of the CF/DND with respect to the safety of A&E throughout the entire life cycle. DAER will continue to monitor all initiatives relating to CF A&E Safety, working with organizations such as C-IED TF as well as the DND UXO and Legacy Sites Program to maintain the drive to policy renewal.

Internationally DAER will continue to strengthen the close ties with the US DDESB and to support the efforts within NATO to harmonize A&E Safety policy. Key to this work will be Canadian contributions to identifying gaps in NATO doctrine and developing suitable publications. These efforts will be mirrored in the review of CF doctrine and subsequent document development.

SECTION 4

AMMUNITION AND EXPLOSIVES SAFETY ADVOCACY AND ANALYSIS

Munitions discovered as Improvised Explosive Devices (IEDs) are rigged with C-4 and detonation cord for disposal by members of a Counter-IED team at Tarnak Farms, just outside Kandahar Airfield, Afghanistan, on the 16 February 2009.

Background

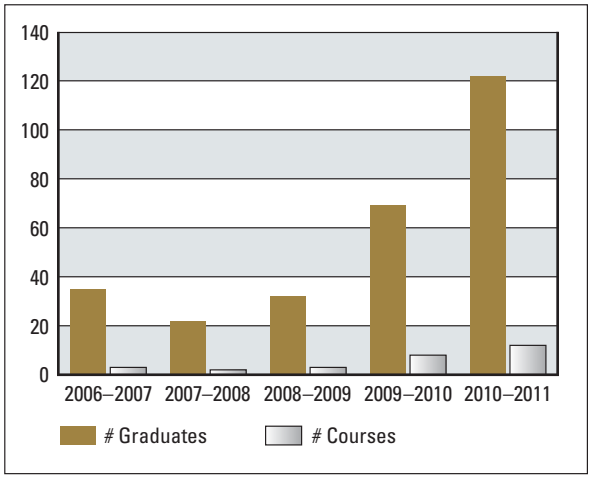
In 2010, the Advocacy and Analysis section of DAER continued to increase the information available to clients through existing tools and continued to participate in the development of new ones. Lack of DND resources regarding Information Technology support resulted in delays in the development of Distance Learning courses and of the Ammunition and Explosives Safety Information Management System, two crucial elements necessary for the furtherance of the Ammunition and Explosives Safety Program.

A&E Safety Advocacy and Analysis Program of Work for 2010

Policy – The main policy initiative developed by the Advocacy and Analysis Section of DAER was A&EI 30 concerning the new, simplified, reporting procedure for Accidental Small Arm Discharges that do not involve deaths, injuries or materiel damages. The previous reporting procedure was identical to that for reporting accidents or incidents. A qualified individual from the supporting base ammunition section was required to investigate and, as a result, most units would not report. The new procedure uses a form to be completed by unit personnel and submitted directly to DAER. Rank and qualification of authorized unit personnel are decided by the respective Level 1s. As a result, the whole process can now be completed in minutes. This will hopefully increase reporting and allow for a detailed analysis of root causes.

Development of A&E Safety Courses – In 2007, DAER began the process of converting the Base Explosives Safety Course to the Unit Ammunition Representative (UAR) Course, and the process of development of a new course – the Unit Explosives Safety Officer (UESO) Course. UESO Course development was to follow UAR Course roll-out. The UAR Course conversion process was completed and the UAR Course is now being delivered in the classroom. As can be seen in Figure 1 below, capacity has been steadily increased, but still falls far short of requirement. The shortfall was foreseen. In 2008, a project charter was signed with Canadian Defence Academy (CDA) to convert both courses to Distance Learning (DL) format. CDA reorganization and transfer of responsibility to CFSTG resulted in delay. As of end 2010, CFSTG has recommenced conversion of the UAR Course to DL format and development of the UESO Course – the latter for delivery by DL. DL delivery is targeted to commence fall 2011.

Figure 1 UAR Courses and Number of Graduates



Educational and Promotional Products – Educational and promotional products provide the necessary means for the chain of command to educate personnel in furtherance of their AESP. The DAER program of work included further development of these important tools as described below:

- **Posters** – Poster development is an important aspect of the advocacy component of the AESP. Approximately 70% of all ammunition accidents and incidents involve human error. Posters are designed to take the lessons learned from previous occurrences and turn them into educational themes. In 2010, DAER updated and re-introduced one poster and developed and issued two new posters. The two new posters can be seen at Figure 2. One relates to the new Amnesty Box policy; the other to the idea that Explosives Safety is not a game of chance. All the DAER posters are available through the Supply System and through the DAER DIN page.

Figure 2 New Posters Produced in 2010

Figure 3 Examples of Playing Cards being Procured

Card Back

Number Card: each card will have the same background, but a different message

Coloured Joker

The Face Cards have pictures or a drawing, also with different messages

- **Bulletins** – Two new bulletins were published by DAER in 2010:
  - Procedures – The first bulletin focused on the consequences of not adhering to proper procedures. It was produced in the wake of a number of accidents involving the C19 Defensive Command Detonated Weapon, which had resulted in one death and several injuries; and
  - Mixing of Ball and Blank – The second bulletin targeted the mixing of ball and blank rounds. Again, its publication followed a series of accidents and incidents in which ball rounds made their way into exercises wherein only blank rounds should have been available.
- **CANFORGEN** – In addition to the bulletins, a combined DAT/DAER CANFORGEN[5] was also issued reminding CF personnel and the chain of command of the importance of adhering to proper procedures in conjunction with the start of the fall training period.
- **DVDs** – Two videos were distributed in 2010 and a third one was initiated:
  - Pyrotechnics and Small Arms Ammunition Safety – This was the first video produced by DAER. The primary audience is the recruit – at CFLRS and elsewhere. It was distributed in July to CF Schools, Base Commanders and Reserve Unit Commanding Officers. As DND owns the rights, unlimited copies can be made and distributed;
  - Two Buddies and a Bomb – This was a commercial production procured through the British Columbia Professional Fire Fighters' Burn Fund (BCPFF) and distributed to Base Commanders in August. The story is about teenagers injured while playing with a pipe bomb and the video includes original, and graphic, footage of the treatments they received at their local hospital. Unlimited reproduction rights were not procured: bases requiring additional copies can contact DAER or the BCPFF directly; and
  - Safe Pyrotechnics Use – This is DAER's second video production. This follow-on video, to assist in the instruction of pyrotechnics use, is being developed in conjunction with the Combat Training Centre. As with the first movie, topics will be presented in a modular format, allowing the selection of specific items of interest. Filming occurred in Farnham in September and the video should be ready for release in April of 2011.

[5] CANFORGEN 199/10 ADM MAT 003/10 191328Z OCT 10 Use of Ammunition and Explosives in Training

Figure 4 Fridge Magnets and Frisbees Being Procured

- **Promotional Items** – In order to assist with safety program promotion at the base level and within neighbouring communities, DAER has procured a number of promotional tokens which will be distributed in 2011:
  - For CF members – Playing cards and poker chips[6] to complement the poster titled "Ammunition Safety is Not a Game of Chance". Examples of some of the cards can be seen at Figure 3; and
  - For School Children – A number of fridge magnets and Frisbees that complement the poster depicting a young girl about to pick up an artillery simulator. They can be seen at Figure 4.

Communication – Theme 7 of the CRS 2005 Evaluation of the DND/CF Ammunition Safety Program[7] 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:

- **DAER Defence Information Network (DIN) Page** – The DIN site of DAER is a fairly complete repository of information for members of the ammunition program and contains information on regulatory and safety matters. Regrettably, the CFTO link, which was one of the more popular aspects of the site, no longer allows direct access to CFTOs and other publications due to business practice changes by ADM(Mat)/DSCO;
- **Conference** – The 4th Annual DAER Ammunition and Explosives Safety Conference was held between the 30th of November and the 2nd of December at the Government of Canada Conference Centre located in the Portage Phase IV complex in Gatineau. Over 100 people attended the event, some of whom can be seen at Figure 5;
- The conference included updates from various stakeholders of the ammunition program including DAER, DAEME, UXO Program, CF EOD and ADM(S&T), as well as guest presentations and participation by Natural Resources Canada. The conference also provided a venue for L1 Ammunition Technical Authorities from CMS, CLS, CAS and CANOSCOM to meet with their community members.

Figure 5 Attendees at the 4th Annual DAER Ammunition and Explosives Safety Conference

[6] Poker chips will be distributed as individual tokens, not as playing sets.

[7] 1258-101-2 (CRS) Evaluation of DND/CF Ammunition Safety Program, February 2005

Electronic Tools – Theme 4 of the CRS report was "Information for Decision Making" and one of the recommendations was to "Establish a comprehensive departmental system for the collection, analysis, and dissemination of ammunition safety information". DAER subsequently reviewed the situation, determining that the few tools available required updating or replacement. DAER also identified a number of new requirements. The Ammunition and Explosives Safety Information Management System (AESIMS) was initiated in 2008 as an ammunition community system. Progress is summarized below:

- A total of 11 requirements were identified in 2008. With help from ADM(IM) and ADM(Mat) specialists, these were detailed in the ADM(Mat) MA&S Requirement and the ADM(IM) Business Requirement. The 11 requirements were separated into two groups. The first group of five requirements, listed below, are for priority action. The second group of six requirements are dependent on decisions about higher-level Enterprise solutions and are for later development:
  - – Accident and Incident Reporting;
  - – Ammunition Defects and Malfunctions Reporting;
  - – Safety Survey Register;
  - – Storage Licence Register; and
  - – Risk Assessment Tracking Tool.
- In order to evaluate the requirements, ADM(IM) requested in 2008 that Business Process Mapping (BPM) be carried out. As a result of higher priorities and the shortage of qualified consultants, the BPM process only started late in 2009. On 29 April 2010 the BPM files were transmitted by ADM(Mat) DMSPR to ADM(IM) DIMR; and
- Further action on the AESIMS requirement is pending a departmental rationalization of IM projects under ADM(IM). As such, no progress on AESIMS has occurred in the last year and the Departmental priority for this project is still unknown.

The lack of progress in developing required IT tools in order to establish a comprehensive departmental system for the collection, analysis, and dissemination of ammunition safety information is prohibiting further development of the DND/CF AESP. It has been five years since the CRS Evaluation and there has been no progress in developing the required departmental tools. Considering the importance of this requirement, solutions must be found in order to progress this key initiative further.

Summary of 2010 Accident and Incident Analysis

General – A detailed analysis for 2010 is attached as Annex B. Along with the analysis is a summarized list of accidents and incidents. The summaries have been included to promote dialogue down to the unit level and to illustrate the potential seriousness of any incident or accident involving A&E.

Occurrences – Figure 6 provides a trend analysis for reported occurrences (accidents and incidents) during the past ten years, while Figure 7 provides deaths and injuries over the same period.

Analysis Summary – Based on the historical averages and the detailed analysis at Annex B, the following points are worthy of note:

- Most events are the result of human error (72% – which is comparable to the previous three years);
- There is insufficient evidence to support a general statement that personnel are receiving inadequate training; however, there were a number of instances that do call into question local/unit focus on training and standards, including control of ammunition;
- Deliberate deviations from procedures caused 15% of occurrences (up from 10% in 2009). The relatively large number of accidents and incidents categorized as deliberate deviations, and the nature thereof, tend to suggest that there may be a lack of respect for established drills and procedures;
- In the vast majority of reported cases, the ammunition or explosives worked as designed. There were no injuries due to ammunition faults;
- 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;
- The increase in accidents and incidents in 2010 is due to increased CAS reporting. The magnitude of the change (100% increase) is most likely attributable to two factors: increased force generation activities in support of theatre operations and a decline in trade knowledge being addressed through the Air Operation Enhancement Project.

Figure 6 Occurrences 2001–2010

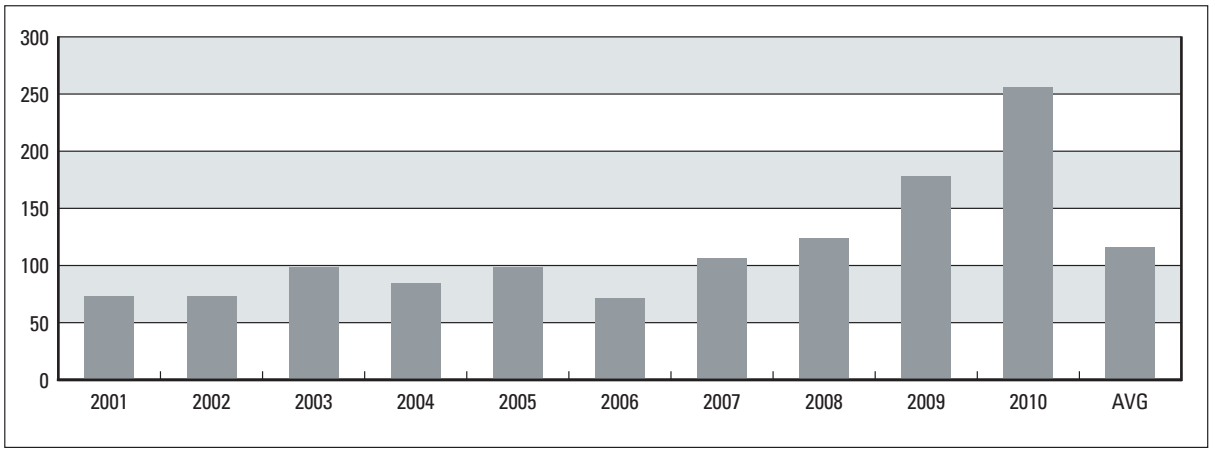
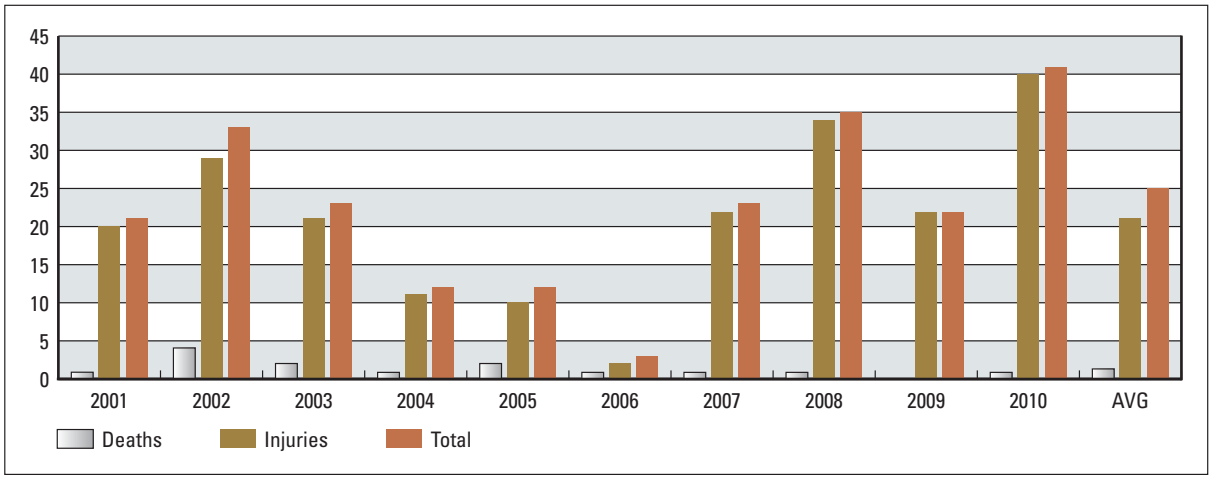


Figure 7 Deaths and Injuries 2001–2010



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 CLS, 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 CMS and CAS, reporting appears to be a matter of routine.

There is a parallel concern with lack of reporting from CLS units under command of CEFCOM. A change in reporting ethos is required. Further, CEFCOM lacks a dedicated Level 1 Ammunition Technical Authority (L1 ATA) and in the meantime is supported by CANOSCOM J4 Ammo. Consideration should be given to establishing such an office, or at least re-visiting the level of support actually being provided to CEFCOM by CANOSCOM J4 Ammo. Robust outreach/education programs should be pursued within both CLS and CEFCOM in order to increase individual and unit awareness of ammunition and explosives safety.

The recent re-introduction of a Base Explosives Safety Program should alleviate some of the concerns with respect to CMP/CFB Borden reporting. The formal establishment of an L1 ATA within CMP should also be considered.

A&E Safety Advocacy and Analysis Program of Work for the Years 2011 and 2012

Policy – The rewriting of the main AESP manual, A-GG-040-006/AG-001 DND Explosives Safety Program, is scheduled for 2011. As a result, the manual on reporting, A-GG-040-006/AG-002 DND Ammunition or Explosives Accident, Incident, Defect and Malfunction Reporting will be amended, as well as the two related DAOD's. The main change will see the terms accidents and incidents being replaced by "occurrences", with better tools to determine causes once investigations are underway. The presence of deaths, injuries and damages, along with the value of the A&E involved, will also be taken into consideration to determine at what level the investigation will occur, in a similar fashion to the Flight Safety Program. The AESP will also be brought in-line with the latest standards used by the Health and Safety community in Canada, the CAN/CSA-Z1000-06 Occupational Health and Safety and the CAN/CSA-Z796-98 Accident Information.

Development of Courses – Until the distance-learning development of the UAR and the UESO courses has been completed and both are running, the Advocacy and Analysis section will not undertake the development of any other course.

Educational and Promotional Products – The development of vignettes, bulletins, posters and movies, as well as the procurement of promotional items is an ongoing responsibility. At the end of 2011 and in 2012, the development of a Multimedia Database will start. The aim is to create a database of all major accidents that occurred in Canada and for which information is available at Library and Archives Canada. It will require a lot of research at first, but once in operation, it will be relatively easy to keep up to date. Specific international accidents of interest could also be amalgamated, but the costs related to obtaining images or movie clips are significant.

Communication – In addition to the ongoing DAER DIN page, Shared Workspace and DAER Annual Conference, two projects will be initiated in 2011 and 2012:

- **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, will resolve this issue; and
- **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 page with the possibility of producing a printed version at a later date.

Electronic Tools – With the review of the AESIMS BPMs by ADM(IM), resourcing for the project will need to be determined and business planned as further development of this key project cannot be done within the present resources of DAER.

Summary

The 2010 year has witnessed further improvements in the number and quality of products available to DND/CF for advocacy purposes. The projects related to IM/IT improvements identified in the CRS evaluation have stalled and as a result DND/CF is facing a higher level of risk than necessary by not having suitable tools for reporting, data collection and analysis.

The lack of reporting with respect to accidents and incidents is still cause for concern and this, combined with the lack of proper IT tools, hampers the ability to properly analyse data, hence to identify trends and resolve problematic issues.

In the next two years, a major review of the main policy documents will hopefully result in a better understanding of the program by the commanders at all levels and better reporting from their subordinate entities, helping increase the level of safety for all.

CONCLUSION

High explosive rounds are laid out prior to firing the C3 Howitzer, during Exercise DEFENSIVE GUNNER at Canadian Forces Base Shilo from 25–27 November 2005.

General

The third annual report builds on the first two reports in an attempt to tell the story on how well the DND/CF is self-regulating under its exemption from the *Explosives Act*. In particular, this and the previous annual reports have examined key areas such as policy development, compliance verification of selected activities in the A&E life cycle, development of A&E safety related training, advocacy activities and trend analysis of A&E occurrences.

One of the present shortcomings in reporting on how well the DND/CF is doing with respect to the safe use of A&E throughout its entire life cycle is the lack of a performance measurement system to score performance and identify areas for improvement based on set criteria and indicators. To date, this has not been possible due to the lack of required tools and the need to allow some of the recently established processes time to mature. Notwithstanding, following the recent development of a number of key initiatives, the possibility for enhancing the Departmental report into a more articulate scorecard, based on results and performance, would be feasible in the future. In particular, progress in the following areas will be instrumental in providing this added feature to the annual report:

- Further development and implementation of an overarching risk management framework for A&E activities in order to provide greater visibility and tracking of high risk activities;
- Implementation of the A&E Safety Survey at the command and base level in order to provide a balanced scorecard assessment of the A&E program;
- Trending data and analysis of A&E occurrences; and
- Development of AESIMS as the corporate tool for the safety management of A&E.

Despite this deficiency, it is nonetheless possible to provide a qualitative assessment of where DND/CF presently stands with respect to the A&E safety agenda, based on DAER's annual review of the A&E program since 2007. In order to provide this assessment, it was decided to tailor several of the key elements of the Treasury Board Management Accountability Framework (MAF). This will allow the identification of present strengths and weaknesses of the DND/CF ammunition program from a regulatory and safety perspective.

Of the 10 key elements of the MAF, the categories in Table 1 were chosen as having applicability in the area of A&E safety management and were tailored to fit within the context of reporting on the performance of the ammunition program.

Table 1 MAF Assessment Elements Tailored for Ammunition Program

ASSESSMENT 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; and
- **Strong** – no deficiencies in any of the measures – exceeds requirements of the DND/CF A&E regulatory framework.

The tEODor (the Explosives Ordnance Disposal observation robot) used by the Counter Improvised Explosive Device (C-IED) team, demonstrates its capabilities at Camp Nathan Smith, the Provincial Reconstruction Team site in Kandahar city, Afghanistan, on 15 February 2009.

Assessment Element #1 – Governance and Strategic Direction

Overall Rating: "Opportunity for Improvement"

At the time of the stand-up of DAER in November 2006, this element would have been ranked as "Attention Required". In the past four years, DND/CF has been paying increased attention to ammunition program issues and there have been a number of concrete actions to enhance governance and strategic direction. With respect to "regulatory and safety governance", the stand-up of DAER as an organization with a dedicated focus to safety was a milestone decision in fulfilling DND/CF's self regulatory requirements.

From an ammunition program management perspective, the stand-up of key organizations such as DAEME in the Materiel Group, J4 Ammo in CANOSCOM, C-IED TF in CLS and of the DND UXO and Legacy Sites Program in the Infrastructure and Environment Group have allowed the Department to provide added focus on A&E issues throughout the life cycle. Moreover, the creation of the Ammunition Board has allowed the department to examine a number of ammunition program issues at a more strategic level.

There has also been a noticeable increase of visibility of ammunition program issues, notably through briefings of safety and regulatory issues to the various senior committees (CC, DEM and DMC) and NATO, both within the Logistics Committee and the CNAD Ammunition Safety Group.

Despite the progress in the past few years, ammunition program governance and strategic direction remains a challenge as it involves a myriad of stakeholders with competing priorities – with no overall process owner in the Department at the strategic level. Although the work of the Ammo Board and related working groups has resulted in an increased focus in the areas of requirements rationalization, program execution and strategic issues; it is predominantly a focus group which discusses and resolves cross-boundary issues without assigned authority and accountabilities.

In the absence of a dedicated strategic organization responsible for ammunition program issues, there is a continuing requirement to discuss and negotiate a number of issues for decision, and at times DAER will involve itself outside of its "safety and regulatory" mandate in order to assist in resolving cross-boundary issues across the L1s. Specifically, it should be noted that the split of responsibilities for the life cycle and inventory management of A&E between CANOSCOM/CMSG/J4 Ammo (responsible for inventory management) and ADM(Mat)/DGLEPM/DAEME (responsible for the life cycle management and in-service support); and the further sub-division of responsibilities for the life cycle management of missiles and guided weapons between the various EPMs and DAEME for the explosives life cycle management requires significant cross-organisational dialogue for issue resolution.

The following points should be considered in order to improve governance and strategic direction for the ammunition program:

- Examine options for assigning A&E expertise at a senior level in an ammo strategic function, possibly within the SJS or ADM(Mat) COS. The ammo strategic function would provide an increased focus for National Inventory Control Point (NICP) decisions, A&E allocations for operations as well as acting as the L1 Ammunition Technical Authority for L1 organizations lacking the required expertise;
- Undertake a review of DAOD 3002-0 A&E functional authorities to ensure appropriate split of responsibilities between ADM(Mat) CANOSCOM, the L1s and ECSs; and
- Examine the specific accountabilities of the Ammunition Board to formalize authorities for decision making on issues which affect the ammunition program writ large.

Assessment Element #2 – Policy and Programs

Overall Rating: "Opportunity for Improvement"

The CRS 2005 Evaluation of the DND/CF Ammunition Safety Program had identified major gaps in key policy and guidance publications for ammunition safety. Furthermore, it pointed to a requirement to develop additional program instruments and exploit the greater use of e-solutions. Although this element is assessed as still requiring improvement, developments in the past three years have been considerable. In particular, progress in the following areas should be noted:

- Restructuring of the A&E policy framework, with a top down prioritization for policy review and production. DAODs have been reviewed and republished and the supporting safety related CFTOs are under development and will be published over the next two years;
- Significant work within NATO and in cooperation with our closest Allies to identify NATO responsibilities for A&E planning and safety management in NATO led operations. This should result in the formulation of Allied Joint Doctrine as well as CF Joint doctrine in the next year;
- Establishment of a compliance verification regime for A&E activities (with the third cycle results published in this report);
- Development of the Ammunition and Explosives Safety Survey (AESS) as a safety program assessment tool for commands and bases;
- Re-establishment of the A&E Safety Program and development of advocacy and training tools; and
- The 2009 review of the Ammunition Safety and Suitability Board highlighted a solid process for ensuring the safety of A&E procured by the DND/CF with several opportunities for improvement.

In assessing this element, there is one sub-element which is viewed as requiring attention and is assessed as: **"attention is required"**. The development of e-tools, in particular progress of the "Ammunition and Explosives Safety Information Management System (AESIMS)" is presently on hold due to lack of priority within the IM Group. Without further work on AESIMS, the development of e-tools for the safety management of A&E will not be possible.

Sapper Allan Vartdy, 2 Combat Engineer Regiment (2CER), prepares a demolition charge as part of Operation TOPAK SHKAR in October 2010 in the Panjwa'i District.

In order to improve Policy and Programs the following points are noteworthy:

- Resources must continue to be applied in order to complete the restructuring of the A&E policy framework and publication of required policy documents;
- Program tools such as compliance verifications, AESS and the safety and advocacy program implementation need to continue maturing;
- Requirement to develop the UAR and UESO Distance Learning packages;
- Identified improvements for safety and suitability for service assessments need to continue to be implemented; and
- Further development of AESIMS is required.

Assessment Element #3 – People

Overall Rating: "Opportunity for Improvement"

The need for investing in human resource development to ensure the continued safe conduct and management of ammunition activities in light of expected attrition in the coming years is well understood, and in particular ADM(Mat) has been playing a lead role in concert with CMP. Specifically, the following initiatives are viewed as critical in moving forward with the HR agenda in support of the ammunition program:

- Oversight role of the Logistics Branch Integrator in the Materiel Group for the development and retention of A&E specialists in support of the ammunition program;
- Development of a Canadian Ammunition Technical Officer training package, in order to meet the requirements of the CF, including improving the selection of the right files and ensuring appropriate career management for the officers who are chosen from the six different classifications;
- SLA between DGLEPM and RMC for the conduct of the Advanced Ammunition Engineering post-graduate program;
- Increased recruitment of the Ammunition Technician Trade with the aim of reaching PML by FY 11/12;
- Creation of the Air Weapons Systems Technician, including the conduct of the first pilot course with the aim of providing the Air Force with the required armament and A&E skill sets;
- Development of Civilian A&E practitioners under the Civilian Ammunition Technician (CAT) program; and
- Program accountability mapping being conducted by DAER which will result in the documenting of organizational responsibilities as well as job specific accountabilities in the C-09-005-001/TS-000 Volume 1 – A&E Program Management and Life Cycle Safety.

As a whole, the various initiatives form the underpinning required to ensure sustainability of the "people" who support the ammunition program. In the next two years, the following components of the HR renewal are viewed as absolutely critical:

- Successful implementation of ATO training with appropriate selection and career management processes. Consideration should be given to reviewing the 2007 ATO needs analysis to ensure it reflects present requirements;
- Transition of the Advanced Ammunition Engineering post-graduate program from an SLA to a fully funded program through CDA;
- Stabilizing the Ammunition Technician trade; and
- Successful re-introduction of the Air Weapons Systems Technician in the Air Force.

Assessment Element #4 – Risk Management

Overall Rating: "Opportunity for Improvement"

The development of an overarching risk management policy for A&E activities to ensure that DND/CF has positive control and properly manages higher risk activities is on track. This includes the final review of existing individual policies and the development of an initial framework in the form of a draft DAOD. It is expected that the policy will be published in the next year with formal reporting of higher risk activities with mitigation plans being reported in the DAER 2013 Annual Report. The following activities in the next year will be key in progressing this initiative forward:

- Confirmation of the assigned level of approval authorities for high and very high-risk activities;
- Further consultation with the various L1 organisations to determine which A&E activities fall within the framework; and
- Adjusting existing risk processes to be in line with the new policy.

Assessment Element #5 – Stewardship

Overall Rating: "Opportunity for Improvement"

Considering the wide range of activities that make up the ammunition program, proper stewardship of resources has a direct bearing on the regulatory framework. The A&E inventory, which is valued at approximately $3 billion with important annual procurement investments (in the range of $250 million in National Procurement funds alone) demands a high level of stewardship and a clear understanding of roles and responsibilities both within and external to the department. For this reason, DAER has been examining a number of stewardship issues in the context of contributing factors to a healthy regulatory framework.

Specifically, the following ammunition program activities are viewed as critical to exercising sound stewardship on behalf of DND/CF and are discussed in the context of the annual report:

- Incorporation of environmental considerations into A&E regulation throughout the whole life cycle. Special emphasis has been placed in examining the practice of Open Burning (OB) and Open Detonation (OD) as a disposal method at the end of life cycle;
- Monitoring the progress of the demilitarization initiative to reduce the Department's reliance on OB and OD for end of life disposal;
- Compliance verification of A&E accounting procedures at the base and unit level;
- Compliance verification of state of A&E infrastructure and realty asset planning;
- Collaborative work with Canada COM for the renewal of the AVCON MOU with Parks Canada to ensure compliance with A&E regulatory and safety requirements; and
- Compliance verification of the DND UXO and Legacy Sites Program activities to ensure due diligence and stewardship in the clean-up activities of former DND/CF ranges.

Overall, DND/CF is demonstrating sound stewardship with respect to A&E, however some areas will require increased focus in order for this assessment factor to be assessed as acceptable in the future. Specifically, the following areas will require focus in the next two years:

- Progressing the demilitarization initiative to a point where an options analysis is presented to senior leadership for subsequent approval in principle for a solution for DND/CF;
- Continued environmental stewardship through the application of A&E regulation for the DND/CF;
- Follow-up action to this annual report in the areas of unit accounting deficiencies and A&E infrastructure realty asset development planning;
- Ensuring that the MOU with Parks Canada for AVCON meets required A&E safety and regulatory requirements; and
- Continued progress by ADM(IE) in addressing UXO legacy sites.

Summary

In assessing the ammunition program's regulatory and safety performance against the five assessment elements selected from the MAF, the overall rating is that there remains opportunities for improvement in virtually all areas. The only specific activity which is assessed as **"Attention Required"**, in that there is inadequate attention to a significant deficiency, is with respect to the development of the required IT tools for the safety and regulatory program through AESIMS. As AESIMS is viewed as a technology enabler for the entire program, it is imperative that this initiative receive the required attention.

In all other areas, the deficiencies can be categorized as moderate and there is evidence of attention being paid at the appropriate level. As a core component of DAER's program of work, the various initiatives will continue to be tracked to ensure continued progress by the DND/CF in meeting its self regulatory requirements under its exemption from the *Explosives Act*. Furthermore, as processes and tools in support of the ammunition program continue to mature, DAER will be examining options for providing an enhanced quantitative rating in relation to A&E safety and regulatory compliance for future reports.

STATUS OF MAIN POLICY MANUALS

Sergeant Andy Gervais is participating in a defensive firing exercise from a CH-124 Sea King helicopter in the Indian Ocean in preparation for counter-piracy operations of the coast of Somalia, in March 2009.

General

The status of the main policy documents being developed by or with the participation of DAER is as per the table below.

A&E DAODs			
Document/ Subject/ Theme	Brief Description	Date Current Document Published	Comment
3002-0	Ammunition and Explosives	November 2006	To be reviewed in 2011
3002-1	Certification of Ammunition and Explosives	July 2004	
3002-2	Insensitive Munitions	July 2004	Presently under review – to be published in 2011
3002-3	Ammunition and Explosives Safety Program	December 2007	To be reviewed in 2011
3002-4	Ammunition or Explosives Accident, Incident, Defect or Malfunction Reporting	December 2007	To be reviewed in 2011
3002-5	Use of Firearms, Ammunitions and Explosives	December 2007	Presently under review – to be published in 2011
3002-6	Display Fireworks	December 2010	Current

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	To be published in 2011	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)	To be published in 2011	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	To be published in 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 October 1993
C-09-005-005/ TS-000	Volume 5 – Deployed Operations (encompasses FOB, Field, BLAHA and Risk Assessment, and Clearance of Battled Damaged Vehicles)	To be published in 2011	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 March 2008
C-09-005-007/ TS-000	Volume 7 – Certification of Ammunition, Explosives and Accessories for Service Use	To be published in 2011	Replaces 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

AMMUNITION AND EXPLOSIVES INSTRUCTIONS			
Document/ Subject/ Theme	Brief Description	Date Current Document Published	Comment
01/07	Ammunition and Explosive 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	Change 01 To be included in new Volume 3 of the C-09-005 series.
05	Transportation of Munitions Scrap	July 2010	Change 02 To be included in new Volume 3 of the C-09-005 series.
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	

AMMUNITION AND EXPLOSIVES INSTRUCTIONS (cont'd)			
Document/ Subject/ Theme	Brief Description	Date Current Document Published	Comment
10	Cartridge Signal 16mm No1 Mk3	February 2008	
11	Demilitarization (To be renamed – Destruction by Open Burning (OB) and Open Detonation (OD))	March 2008	Under review for inclusion of environmental concerns
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
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	To be included in new Volume 7 of the C-09-005 series
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 Increments	June 2010	Change 1 will be published in 2011
30	Accidental Small Arms Discharge Reporting	December 2010	Change 1
31	Destruction by Open Burning of Surplus Propellant on Approved Burning Trays	July 2010	To be included in new Volume 4 of the C-09-005 series

UNEXPLODED EXPLOSIVE 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	Not known	Current OPI – ADM(IE)
ADM(IE) Standard 1606-4000.1-S01- 024	Sustainable Range and Training Area Management	Not known	Current OPI – ADM(IE)
CANFORGEN 181/06 ADM(IE) 002 282157Z NOV 06,	DND UXO and Legacy Sites Program	November 2006	Current OPI – ADM(IE)
B-GL-381-003/TS-000	Range and UXO Clearance Handbook	Not known	To be republished in 2011OPI - CLS/LFDTS
DAPC PoI Policy Guidance	Procedures for Reporting and Destroying Chemical Weapons Discovered at DND/CF Facilities	Amendment, 02 August 2005	Current OPI – DAPC PoI

EOD			
Document/ Subject/Theme	Brief Description	Date Current Document Published	Comment
B-GL-005-316/TS-XXX	Operational Concept of Employment	Draft	Under revision OPI – CF EOD
C-09-008-002/FP-000	Duds and Misfires Ammunition on CF Ranges and Training Areas	August 2005	OPI DAER
C-09-008-003/FP-000	Explosive Ordnance Disposal – Disposal of Stray Ammunition	May 2003	OPI DAER
Defence Administrative Order and Directive (DAOD) 8000-0	Explosive Ordnance Disposal	Under revision	OPI – CF EOD
Defence Administrative Order and Directive DAOD 8000-1	Explosive Ordnance Disposal Instructions	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 September 2010 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 (due for renewal in 2011)	Canada COM manages OP PALACI and leads the DND working group on MOU renewal.

CMS 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 2008	OPI – CMS
MARCORD CS-06	Transportation of Explosives and Ammunition by Motor Transport, Ammunition Lighter, and Military Aircraft Within Maritime Command	Not known	OPI – CMS

CLS A&E POLICY			
Document/ Subject/Theme	Brief Description	Date Current Document Published	Comment
LFCO 22-12	Operational EOD	December 1995	Requires revision OPI – CLS
LFCO 22-11	LFC Range Clearance	September 1995	Requires revision OPI – CLS

CAS 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	Current OPI – CAS

ANNEX B

AMMUNITION AND EXPLOSIVES SAFETY PROGRAM ANALYSIS FOR THE YEAR 2010

A C32 fuze is being screwed into a 105mm artillery projectile during Exercise PROWLING GUNNER VI at Shilo in March 2009.

Deaths and Injuries – For the first time in five years, a death was reported under the AESP.[8] It occurred as a result of a training accident. As detailed at AESP Analysis Figure 1, there were 40 injuries, including one civilian contractor.

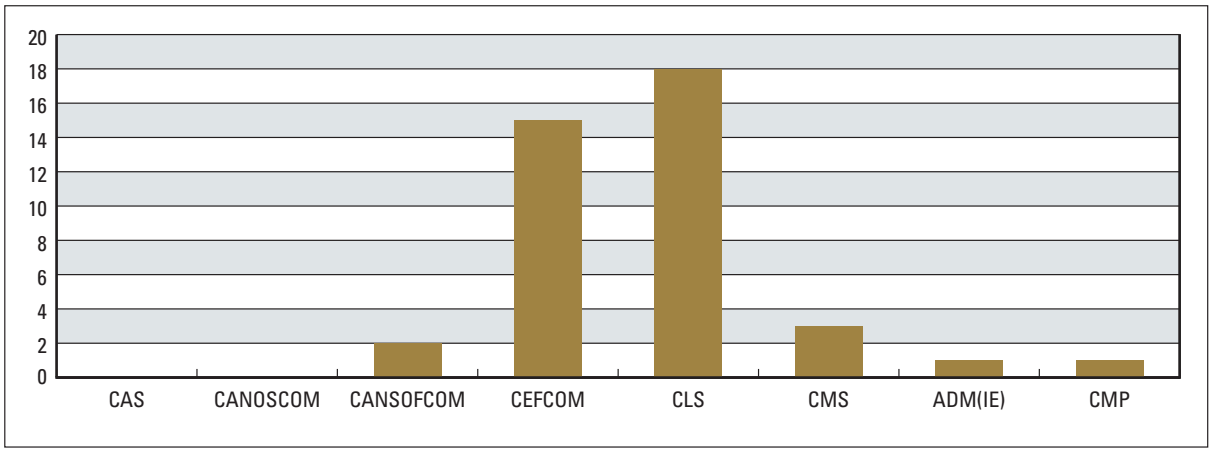
For an historical perspective, a ten-year summation follows at AESP Analysis Figure 2. For 2010, the number of injuries is the highest in this ten-year period, raising the average from 19 to 21. This is higher than 2008 when 13 out of the 34 injuries occurred in a single accident (smoke inhalation when smoke grenades were functioned inside a tunnel). In 2010, 11 injuries occurred when the main weapon of a tank was discharged inside a maintenance hangar. The one death, plus four injuries, occurred during a training accident involving a Defensive Command Detonated Weapon. The remaining 25 injuries are still higher than the ten-year average.

Number of Occurrences – A total of 255 Ammunition Accidents and Incidents, inclusive of ammunition related Flight Safety Occurrences,[9] were recorded in 2010: 58 Accidents and 197 Incidents. This is much higher than the total of 178 recorded in 2009. AESP Analysis Figure 3 puts this in a ten-year perspective.

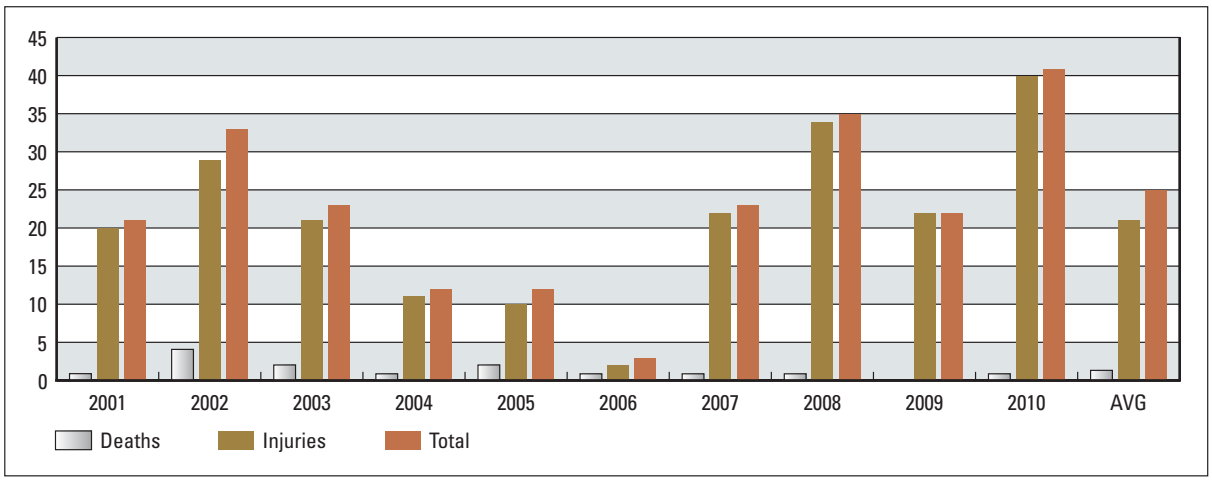
[8] There were at least four deaths directly related to A&E that occurred in the last four years, from either suicide or negligent discharges, none of which were reported under the AESP. Information was taken from Significant Incident Reports, as well as media or medical reports. Those deaths and injuries we have become aware of are included in the graphs.

[9] 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.

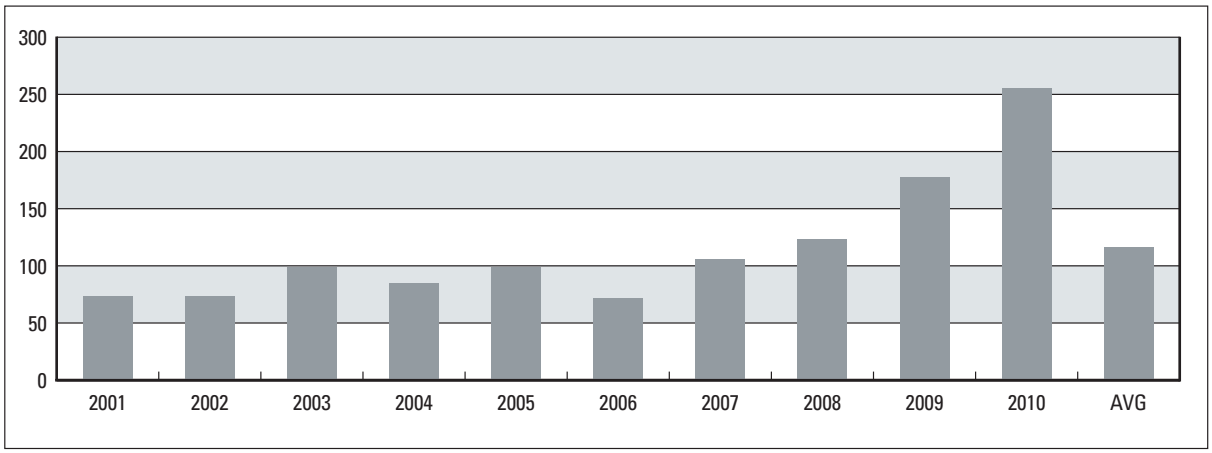
AESP Analysis Figure 1 Injuries



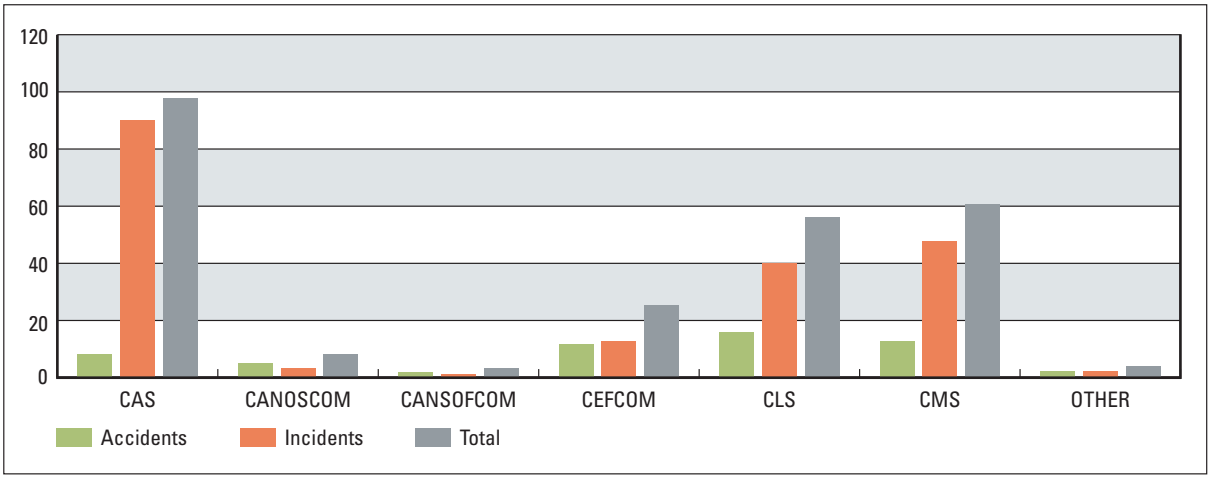
AESP Analysis Figure 2 Deaths and Injuries



AESP Analysis Figure 3 Occurrences for 2001–2010



AESP Analysis Figure 4 Occurrences for2010



The methodology employed in previous years varied as DAER learned and expanded its data gathering capability.[10] Thus, year to year comparisons can only be undertaken after data has been reduced to a common basis. At Figure 1, 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 reported from theatre were attributed to CEFCOM rather than CAS. All ship-related occurrences have been rolled to CMS due to the unique nature of naval operations. In the absence of evidence to the contrary, all Land occurrences roll to CLS, with the exception of accidents and incidents that occur:

- In theatre (roll to CEFCOM or CANSOFCOM);
- At CFB Borden (responsible to CMP/MILPERSCOM);
- In ADM(S&T) units (roll to ADM(S&T), with staff support from CMSG/J4 Ammo);
- ADM(IE) contractors roll to ADM(IE);
- Canada COM / JTFN (unless attributed to a specific unit); and
- CANSOFCOM, when attributed, roll to CANSOFCOM.

Figure 4 shows accidents and incidents for 2010 by command. The category OTHER refers to CMP/MILPERSCOM (one accident and one incident); ADM(IE) (one clearance contractor accident) and one Canada COM/JTFN (one incident).

In order to better understand trends, Figure 5 provides a four-year breakout of occurrences, by command.

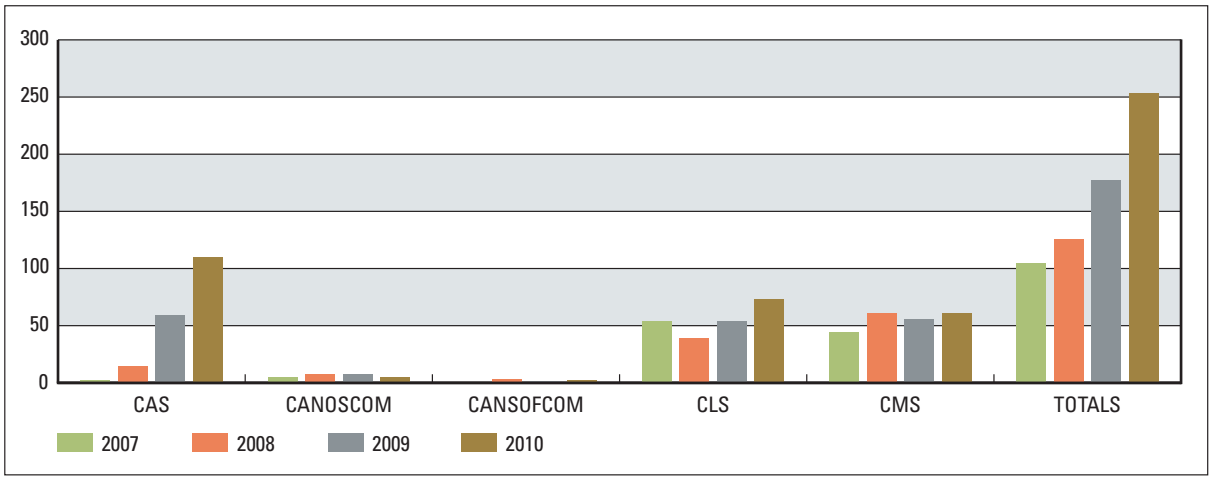
Figure 3 shows a large rise in reporting. Figure 5 indicates the increase is due mainly to CAS reporting. The increase between 2007 and 2009 can be attributed to changes in DAER data collection, but this cannot account for the large rise from 2009 to 2010. There were some recurring technical issues[11] but these cannot account for the magnitude of the change. The magnitude of the change is most likely attributable to two factors: increased force generation activities in support of theatre operations and a decline in trade knowledge being addressed through the Air Operation Enhancement Project.

In this last year, there was a marginal increase in CLS occurrences. In previous reports, CLS has been cited for lack of reporting; however it is difficult to interpret whether the increase is due to better reporting or a decrease in safety. Twenty injuries to CLS personnel were reported. The ratio of accidents to incidents (Figure 4) is 0.425 which may indicate that the increase is due to increased reporting. Delay/lateness of reporting remains an issue.

[10] DAER broadened its means of collection of information. Since 2009, the total includes a number of accidents and incidents that were never reported to the AESP, but which were collected by other means: General Safety Program reports, Significant Incident Reports and news articles.

[11] Uncommanded release of chaff/flare and undetected progressive breakdown of several items. With respect to ammunition, the most notable was case neck separation that led to the restriction of certain lots of 20mm.

AESP Analysis Figure 5 Occurrences by Command 2007–2010 (update with CEFCOM figures, 25 in 2010)



CEFCOM merits further consideration. Of the 25 occurrences noted in Figure 4, 15 originated in Land Operations, 10 in Air Operations. One death and 14 of these 34 injuries occurred in Land units in theatre; only two (hearing damage due to firing a SRAAW(M) without hearing protection) were directly related to combat. The reporting concerns continue with respect to CEFCOM and its land units. The almost one to one ratio of accidents to incidents reported is of concern. The number and nature of reports received are 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.

Despite the intensity of CANSOFCOM operations and training, only one occurrence was reported – an accident. An additional accident and an incident were never formally reported, but were made known to DAER, one almost a year after the event. Both unreported events occurred during training. Despite the presence of an Ammunition Technical Authority within CANSOFCOM, improvement in reporting ethos is required.

CMP/MILPERSCOM is responsible for CFB Borden, a major training centre, and much of southern Ontario. Despite the high volume of on-base training and large number of Reserve units supported by this base, only one incident was reported during 2010. An accident, involving ammunition removed from a CFB Borden supported unit was also attributed to CMP. The lack of an active Ammunition and Explosives Safety Program and committee structure would appear to be a root cause of poor reporting.[12] The establishment of a Level 1 Ammunition Technical Authority within CMP/MILPERSCOM should also be considered.

Lateness of reporting is also an issue: approximately 10% of all reports were filed 10 days or more after the occurrence: the target is 12 hours for the initial report.

Accidental discharges and the lack of reporting thereof has been a consistent focus for comment in previous reports. In 2010 DAER instituted a new reporting system for accidental small arms discharges.[13] There is insufficient data to comment further at this time; however, Director Law – Military Justice Policy and Research reported 415 convictions.

Common user natures (Small arms ammunition (SAA), smoke grenades and pyrotechnics) continue to be involved in a high percentage of incidents and accidents: 111 occurrences. Within CLS, most accidents and incidents related to these items. Both CMP incidents related to common user natures. Within CAS units, cartridge actuated devices (CADs) and propellant actuated devices (PADs) (26), chaff and flares (17) and aircraft bombs (15) were the items most frequently involved. Within CMS units, pyrotechnics and signals (17) and small arms ammunition (17) were the largest categories. For the latter, occurrences generally related to items lost into the sea or to control issues.

[12] Base Explosives Safety Program was being formally re-introduced late 2010.

[13] Ammunition and Explosives Instruction 30 Accidental Small Arms Discharges Reporting

Cause Categories – All 255 accidents and incidents in 2010 were attributed a cause. They are summarized at AESP Analysis Figure 6.

AESP Analysis Figure 6 Cause Categories

CAUSE CATEGORY	NUMBER	PERSONNEL RELATED
Ammunition-related (defect, malfunction, design error)	21	
Deliberate Deviation	36	36
Human Error (error in drill, mistake, poor judgement)	145	145
Other Causes	19	
System-related	24	
Weapon-related	7	
Unresolved	3	
Total	**255**	**181**

Approximately 7% were categorized as Other, a category not lending itself to statistical analysis. The wide range of ammunition natures and circumstances preclude any trend analysis on this category.

Ammunition itself normally functioned as intended. Although there were 21 occurrences of ammunition faults, no injuries were attributed to this category. One related to foreign ammunition, three to case neck separation of 20mm, seven to excessive debris and cracking of 6 Pdr casings, and four to failure of aircraft bombs to detonate.

Personnel were responsible for 72% of all accidents and incidents. The vast majority were attributed to "carelessness" and "poor judgement" (contributing factors), with "usage and handling" as the primary activity type. Further analysis will be conducted with the aim of focusing the Outreach Campaign.

As a result of earlier analysis and subsequent correspondence, CLS training concerning the Defensive Command Detonated Weapon (DCDW) is undergoing review. There is insufficient evidence at this time to support a general statement that personnel are receiving inadequate training; however, there were a number of instances that do call into question local/unit focus on training and standards, including control of ammunition:

- Two occurrences of ball and blank ammunition mixing, both as a result of unit procedures/controls;
- Three shipments (returns) certified as Free From Explosives (FFE) found to contain energetics (including a live fragmentation grenade);
- Nine occasions of ammunition left in weapons (including the main armament of a tank and dismounted aircraft weapons), some resulting in accidental discharges;
- Twenty instances of members intercepted at an airport with ammunition in baggage or munitions recovered from residences/cars. There was a further instance wherein a Ground Burst Simulator was used to destroy a garbage can at a fast food outlet;
- Three instances of tampering, including two with locked Amnesty Boxes; and
- A number of occurrences (including the DCDW and two accidents[14] wherein members were shot by other trainees) raised questions concerning supervision and range safety management.

Deliberate Deviations represented 15% (up from 10% in 2009) of all events and are of particular concern as, in these cases it was deemed that procedures had been deliberately contravened. Accidents and incidents related to Deliberate Deviations are indicated in the 2010 Accident and Incident Summaries with a grey background. The relatively large number (36) and the nature thereof, of the Deliberate Deviations tend to suggest a lack of respect for established drills and procedures.

[14] Due to criminal investigations underway, Ammunition Accident Investigation was precluded. As a result, DAER cannot make any definitive statements on these two accidents.

Appendix 1 to Annex B – Accident Summary for the Year 2010

L1 OR COMMAND RESPONSIBLE FOR REPORTING	2010 ACCIDENT SUMMARY	DATE
CEFCOM	While acting as Number 2 for SRAAW(M) team, concussion from weapon firing caused hearing loss in both ears. It was a hasty engagement and member was not wearing hearing protection.	2010-01-05
CLS	While fire team was conducting house clearing drills, one member was moving down right side of building while another was moving down left side. One member was moving more slowly than other. Faster member engaged a revealed target in center between both members, turned to his left and fired. Having struck target, bullet continued to strike other member in the right shoulder.	2010-01-12
CEFCOM	Material Awaiting Disposal (MAD) Pit Locker was broken into and theft of various ammunition and explosives and salvage.	2010-01-26
CEFCOM	Air Incident. Door gunner sustained minor injury while trying to clear jammed Dillon gun.	2010-01-29
CANOSCOM	Pallet of 7.62mm was caught by forklift boom and fell from a stack of four pallets (approximately nine feet) onto another pallet of 7.62mm which was on the floor.	2010-02-01
CANSOFCOM	During indoor firing of SAA, member received shrapnel wound to shoulder.	2010-02-02
CAS	While loading transport container end cap fell off and the LUU-2A/B fell to the ground, damaging the store. Technicians had not been trained IAW the appropriate CFTO.	2010-02-04
CAS	During training a .50 cal de-armour was used to attack a fuze. Afterwards it could not be opened without the use of a vise. On opening, it was found that the cartridge head had separated and that a section of the rim has been sheared off. Breech had not been fully screwed home, allowing excessive head-spacing.	2010-02-11
CEFCOM	During training, one member was killed and four injured when a Command Detonated Weapon exploded. Four vehicles damaged. Weapon was detonated under command.	2010-02-12
CEFCOM	Two members shot in Accidental Discharge accident. C9 machine gun involved.	2010-02-24
CMP	Artillery Simulator was thrown outside a fibreglass hut. When it exploded it blew the door open, pushed debris into the hut and caused temporary hearing damage to a member near the door.	2010-03-03
CAS	Aircraft gun jam attributed to undetected progressive breakdown of weapon component.	2010-03-04
CEFCOM	While conducting maintenance on mounted C6 machine gun, one shot was fired, hitting member in upper thigh. Weapon had not been properly cleared on return to camp.	2010-03-10
CEFCOM	During firefight an M72E5 rocket was launched at insurgents. Firer and another member were not wearing hearing protection and experienced hearing damage.	2010-03-16
CLS	Unit control error allowed issue of 5.66 mm Ball LKD instead of Blank SAA. Ammunition was loaded into magazines and 6 rounds were fired from a C9 assault rifle fitted with a BFA. Attributed to poor storage practices and to lack of attention by firer when loading ammunition.	2010-03-18
CLS	A new belt was loaded into a .50 cal machine gun. As the gunner cocked the weapon, one round fired prematurely, before being fully seated. It caused damage to the forward portion of the barrel extension, the extractor and the feedway. A second round was forced against the feedway causing the bullet to crush into the cartridge case. Attributed to a weapon fault.	2010-03-28
CLS	Inadvertent functioning of M4 detonator during set up and testing of Defensive Command Detonated Weapon.	2010-03-30
CANSOFCOM	Member received burn: result of failing to lock barrel to weapon during barrel change.	2010-04-15

L1 OR COMMAND RESPONSIBLE FOR REPORTING	2010 ACCIDENT SUMMARY	DATE
CEFCOM	Five local nationals were stopped and searched while exiting gate. Ammunition was found under the vehicle seat. Ammunition had been found unattended in a modular tent. Attributed to improper supervision of local nationals and incorrect storage and security of ammunition.	2010-04-15
CEFCOM	Member was issued with an incorrect size of hearing protection – none of his size available. Member suffered temporary hearing loss during 25m zeroing.	2010-04-26
CMS	Member was struck by a Simunition projectile (from rifle or pistol was not known) while performing extraordinary rapid deployment (ERD) exercises. During the scenario the shell portion of her FX 9003 helmet became detached from the hood and the round struck the crown of her head. Attributed to a failure of the FX 9003 external plastic helmet shell to adequately interlock with the protective hood.	2010-05-01
CLS	During an M-777 fire mission, there was a slow burn by one of the charges in the breech. The crew executed improper misfire drills, resulting in damage to weapon parts. Investigation revealed a need for greater clarity concerning misfire drills.	2010-05-13
CLS	A 60mm mortar was being lever-fired when a round functioned without manual assistance from the Number 1. Loader sustained minor injuries to right hand and fingers. Attributed to a weapon malfunction in that the Bipod Mount M5 firing pin was noted sticking out while still on the lever-firing mode (probable foreign object/debris).	2010-05-17
CAS	Gun wreck caused by case neck separation.	2010-05-20
CMS	During strike down from No 1 to No 2 magazine, one 76mm TP-S round was damaged as a result of being inserted prior to hoist completing a full cycle.	2010-05-21
CEFCOM	While showing his pistol to friends, Pte accidently discharged the weapon. Round bounced off the cement and produced a small graze on the underarm of a third member.	2010-05-21
CLS	Crew failed to unload main weapon on tank prior to entering tank park. Vehicle was parked inside. While personnel were in the building, a check of the fire control system was undertaken, resulting in the discharge of a 105mm blank round. Total of 11 personnel injured (blast/overpressure).	2010-05-26
CLS	During training on installation of Flare Surface Trip, soldier inadvertently released the fly-off lever.	2010-06-16
CMS	After firing, an ejected casing landed on the shot mat and hot residue landed on a member's uniform, melting the fabric. Excessive debris reported.	2010-06-20
CAS	Small hole found in leading edge of rotor blade was attributed to ricochet experienced during training mission.	2010-06-23
CEFCOM	Technician injured while trying to remove a 25 mm APFSDS-T projectile from its cartridge case. Propellant was ignited. Activity and procedure were not authorized.	2010-06-23
CLS	An Ammo NCO was behind a 9 ft cement wall preparing students for the next relay when a grenade fragment struck him in the face. Attributed to an isolated incident involving a lobbed fragment descending at a steep angle.	2010-06-24
CANOSCOM	During Harpoon missile off-loading, one Harpoon loading beam was bent out of true when rigger signalled crane operator to lift without first confirming all locking bolts had been released from the locking clamps.	2010-07-05
CLS	When a stoppage occurred, member removed magazine and after replacing magazine hit the bolt catch. Weapon fired at this point but did not eject round and bolt stayed forward with expended round in the breech. Wpn Tech forced the bolt out and pried out round. Extractor on bolt was bent.	2010-07-06

L1 OR COMMAND RESPONSIBLE FOR REPORTING	2010 ACCIDENT SUMMARY	DATE
ADM(IE)	Contractor working on final disposal of aged and damaged detonators retrieved by other technicians was slightly injured when a pyrotechnic delay fuze portion (not main detonator filling) functioned in his hand. Attributed to fuze being highly sensitized as a result of earlier damage to detonator.	2010-07-09
CMS	During refuelling at sea, the distance line came into contact with the top of the Pains Wessex, causing it to release from its mounting bracket. Attributed to lack of attention on part of crew.	2010-07-10
CANOSCOM	Four loose missile containers were being loaded from the ground onto a trailer using a rental forklift. One container rotated forward and dropped onto its side on the trailer deck – a distance of approximately 20 inches. Investigation revealed that forks were insufficient to carry two containers side by side, double stacked. Attributed to error of judgement on part of forklift operator.	2010-07-15
CMS	While ammunition was being transferred between decks by elevator, the corner of a triwall caught. The triwall was pulled down and two boxes containing ammunition were crushed. Containers were damaged but there was no sign of loose propellant. One flare casing was damaged.	2010-07-24
CANOSCOM	During warehousing with forklift, a corner of a pallet struck a container on a fraction pallet. Qty 4 M19A1 containers were dented. On inspection, 880 rounds 7.62 mm Ball rounds were sentenced unserviceable.	2010-07-29
CMS	During reality-based training scenarios, OPFOR role-players were injured. Safety equipment issued was not suitable for rounds in use. SIM FX ammunition was used outside the parameters of the certificate of acceptance into service.	2010-08-12
CLS	Member received burns to hand and face when he tampered with an artillery simulator during a post firing range sweep.	2010-08-25
CLS	After shooting approximately 500 rounds from a C7A2, there was an explosion that caused the bolt to break off. Weapon Tech attributed failure to faulty ammunition casing, but this is still under investigation.	2010-08-25
CLS	During house clearing, a soldier entered a room, saw the target on the right and fired 2 rounds. The rounds went through the Figure 11 target and the plywood wall and hit two personnel behind the wall. The wall had not been reinforced with sand bags as per the SOP for a FIBUA site.	2010-08-30
CMS	Marker Man Overboard Series 3 damaged on underside when being re-seated. It struck the guardrail.	2010-08-31
CLS	A .50 cal machine gun was damaged beyond local repair when a member mistook it for a target during Battle Inoculation Training.	2010-09-01
CLS	During battle inoculation training rifleman shot 14 rounds, placed his weapon on safe, removed magazine and slung C7 weapon on his back. After reloading his magazine, he swung his weapon back to the front, loaded, selected fire and fired one round. The round exploded in the chamber, the overpressure blowing out through the bottom of the magazine.	2010-09-02
CMS	Sea Training member placed Thunderflash in carpeted officers' mess, resulting in heat/ burn damage to carpet and hand towel.	2010-09-06
CAS	Load crew was unable to complete loading of an AIM-7 missile, despite multiple attempts. Aft stop trigger on launcher was broken due to failure to ensure the Aft Stop Indicator was in the correct position.	2010-09-07
CMS	Ready Use container containing Smoke Marker MOB was overturned during high speed transit and marker was lost overboard (unarmed).	2010-09-26
CAS	One belt (220 rounds) 7.62mm Blank rounds was lost from aircraft while in flight.	2010-09-29

L1 OR COMMAND RESPONSIBLE FOR REPORTING	2010 ACCIDENT SUMMARY	DATE
CAS	Chaff and flare pod dropped during aircraft unloading as technician was removing the pod. Pod and contents were destroyed later by EOD Team.	2010-09-29
CMS	Weapon failure and damage (sheared bolt) caused by failure to remove the extractor removal tool prior to firing of 40mm BOFORS gun.	2010-10-06
CEFCOM	EOD Tech injured when detonator exploded in member's hand during level II exploitation.	2010-10-18
CLS	Police responded to 911 call and discovered remains of a Simulator Projectile Ground Burst in a destroyed garbage can. Nearby car was also damaged.	2010-10-24
CMS	During heavy seas, compressor broke from its storage container and struck a Harpoon missile canister and launcher. Slight dent to canister and some paint removal.	2010-11-09
CMS	A 76mm gun jammed. Two rounds from within the loader drum were damaged and were jettisoned.	2010-11-18
CMS	Marker Man Overboard was dislodged and activated by the jetty crane load wire while launching the zodiac.	2010-12-07

Note 1. Summary includes data originally reported in FSOMS.
Note 2. Greyed out cells indicate deliberate deviations.

Appendix 2 to Annex B – Incident Summary for the Year 2010

L1 OR COMMAND RESPONSIBLE FOR REPORTING	2010 INCIDENT SUMMARY	DATE
CAS	During pre-flight checks, aircrew discovered a time-expired Marker Location Marine. Marker was removed from aircraft and placed in quarantine.	2010-01-06
CAS	Nine time-expired DICASS were discovered during pre-flight check. Items had been installed and both maintenance and flight crews had failed to recognize they had expired. Attributed to a Transgression of Orders and a facilities design issue, in that the same lock-up was being used for both serviceable and expired stores.	2010-01-07
CAS	Munitions improperly loaded. All the Mk84 SUSs were improperly loaded and secured in aircraft making removal in an emergency difficult. Tech had not been trained in loading these stores.	2010-01-08
CEFCOM	Accidental discharge of M240 machine gun on the ground at FOB.	2010-01-10
CAS	MLM dispenser seal was found on the side of a public access road 0.5NM from threshold of runway. Investigation revealed three separate aircraft were involved in flight ops the day the seal was found. It was discovered two aircraft were missing parts. Remaining aircraft were inspected and similar situations found – some chutes contained lanyards, others did not. Due to technician error in that lanyards were not properly connected, allowing seal to not be retained.	2010-01-11
CLS	Small arms ammunition seized by civilian police from a CF member.	2010-01-11
CMS	Accidental discharge on pistol range during training. Round impacted 5 metres from firing line.	2010-01-12
CMS	Fifteen diver recall pyrotechnics reported missing after exercise. Attributed to poor control and usage by visiting units.	2010-01-14
CMS	A Force Protection Party member was removing his tactical vest when both spare magazines fell out of the pouches. One magazine fell through a hole in the jetty and was lost. The Velcro on the pouch had hooked onto his coveralls.	2010-01-18
CAS	During inspection, sonar cartridge was found not to be etched with Lot Number. This had been missed through previous inspections. Attributed to failure of technicians to etch cartridge on first installation and failure to notice lack of number during subsequent inspections.	2010-01-21
CEFCOM	Maintenance was carried out on SPS-65 system even though the flare dispensers were loaded with flares.	2010-01-22
CLS	Contractor recovered a 25mm TP-T round from the battle damaged LAV III that had been returned for repair. Round had not been located by previous clearances.	2010-01-25
CMS	One round lost from 9mm magazine in tactical vest.	2010-01-25
CAS	While preparing to dismount AIM 9 the bomb loader began to smoke and give off an acrid smell. Plastic wiring covering a wire bundle was melting and dripping onto exhaust manifold. Wiring had not been properly routed.	2010-01-28
CLS	During defensive exercise, candidate noticed he was short one magazine. White light search failed to find item (in snow). Daylight search was also unsuccessful.	2010-01-29
CLS	A number of 25mm TPDS rounds recovered from private residence by CFB Edmonton MPs. Civilian in possession of items voluntarily turned them over to local police.	2010-01-30
CAS	Time expired CADs, PADs and SMDC lines installed in aircraft used for training technicians. TX'd CADs and PADs were to be removed (deviation granted to retain SMDC lines) but was not immediately actioned due to students using aircraft. Later removal requirement was forgotten and not actioned.	2010-02-01

L1 OR COMMAND RESPONSIBLE FOR REPORTING	2010 INCIDENT SUMMARY	DATE
CLS	Band police executed a search warrant at home of a Canadian Ranger Patrol member and seized four weapons, one of which was CF issue. Additional weapons were found during search of sea containers provided for storage of CF equipment.	2010-02-02
CMS	A 9mm magazine and 8 rounds lost when pocket of tactical vest pocket caught on articulating ladder, opened and magazine fell into the sea.	2010-02-03
CMS	A 9mm magazine and 8 rounds fell into the sea from member on jetty. Magazine had not been securely locked in weapon. Magazine was later recovered by divers.	2010-02-05
CAS	While conducting SAR proficiency training, crew noticed that one (possibly three) MLM were stored in the ammunition Bunyan in the ARMED position.	2010-02-09
CMS	Ship attributed missing 20mm rounds to CFAD error in count/packaging.	2010-02-10
CAS	During preparation for the flare drops, the plastic cover separated from the casing. Flare was armed for 250 feet, cover popped off just prior to inserting the lanyard. Flare was secured and segregated.	2010-02-10
CMS	During pre-sail checks, magazine yeoman discovered a COMET flare without packaging and a pulled pin. Another COMET had unsafe packaging. Ship stated ammunition was embarked from CFAD in this condition.	2010-02-10
CAS	Aircraft was loaded with an "Extorp" and a "Hottorp". Intent was to drop Extorp and de-arm/download the hottorp on return. While on the range, the wrong torpedo was dropped on the target.	2010-02-10
CLS	Visiting EOD team noted four suspect items of ammunition on display in a reserve armoury.	2010-02-15
CAS	Fire bottle was discharged during maintenance (1st line servicing). Attributed to procedural error, with underlying cause that the Senior Tech did not ensure the Junior Tech fully understood the scope of what was being asked.	2010-02-16
CEFCOM	Ammunition can was blown off M240 gun on right side as gunner was adjusting line of fire. No ammunition was lost, only can (empty). Suspect lightness of can (little ammunition left) and possible improper attachment to mount may have contributed.	2010-02-19
CLS	Military Police conducted a raid on a member's home, during which ammunition was seized. Treated as possible theft.	2010-02-22
CMS	A Signal Distress Day/Night in a transit pack was found partially crushed (cracked) and someone had wrapped black electrical tape around each end cap. Assumed someone had tried to "save it."	2010-02-22
CAS	Ten cases of 7.62mm ammunition were loaded onto aircraft without updating the aircraft armament state CF338.	2010-02-25
CMS	During small boat transfer from shore, a member of the boarding party dropped a loaded magazine into the water.	2010-02-25
CLS	Member of 1 CPRG was arrested and charged with assault, careless use of firearms and possession of a weapon dangerous to the public. Offences relate directly to his issued .303 Ranger rifle.	2010-02-27
CAS	Fire extinguisher squib serial numbers entered against the wrong fire extinguisher bottle on aircraft paperwork.	2010-02-28
CLS	A Grenade Hand Smoke C8 Red was turned in by a civilian who found it in the kit of her deployed boyfriend.	2010-02-28
CLS	Failed weld on commercial transport trailer caused trailer to collapse while sitting in commercial yard. DND ammunition load was not damaged.	2010-03-01

L1 OR COMMAND RESPONSIBLE FOR REPORTING	2010 INCIDENT SUMMARY	DATE
CLS	Police discovered DND ammunition at a private residence of a soldier after responding to a call.	2010-03-01
CAS	Case neck separation caused gun jam on aircraft.	2010-03-02
CAS	Case neck separation caused gun jam on aircraft (second occurrence).	2010-03-02
CAS	Inadvertent Flare Release. During roll out after an overhead break the pilot inadvertently hit the sill switch with a shoulder, releasing a flare.	2010-03-08
CAS	Aircraft flown with time expired seat initiator.	2010-03-09
CLS	During an advance to contact (training) using blank rounds, a recruit found a 5.56mm Ball round on the ground. Attributed to having fallen from an improperly cleared equipment or inappropriate disposal (instead of amnesty box).	2010-03-10
CAS	LCMM notified unit of an overflown Thruster Cartridge Actuated Device (Canopy Unlatch Thruster). Overflown by 10 days due to wrong expiry date calculation in MRS.	2010-03-10
CMS	While moving a Harpoon Missile, the upper securing clamp became loose, twisted and hit the missile canister causing a scratch and small dent. Lifting of clamp with lifting sling using mobile crane was cause (Human Error).	2010-03-10
CAS	Aircraft flew with three time-expired initiators. Investigation revealed the initiators had been replaced but the component history card had not been updated.	2010-03-10
CAS	Un-commanded Flare Release. During straight and level flight pilot noted that chaff and flare were dispensing un-commanded. Attributed incident to an internal failure of the breech plate.	2010-03-11
CLS	RCMP recovered CF munitions during a raid on a residential address. Individual had been released from the CF.	2010-03-12
CAS	LCMM notified unit of overflown Thruster Cartridge Actuated Device (Canopy Unlatch). Overflown by 2 months. Technician did not notice a discrepancy in data as it was entered into MRS.	2010-03-15
CAS	An aircraft was used for a static display while explosives cartridges were still installed.	2010-03-19
CAS	As the helicopter began to traverse for start-up, a C2A2 Smoke released from an internal launch chute and fell onto the deck while inside the hangar. Smoke did not ignite.	2010-03-19
CAS	During tearing down of OP PODIUM camp, improperly stored ammunition items were discovered in a Willard Container inside a garage.	2010-03-19
CAS	Partially extracted decoy flare (MJU-32B) was discovered on walk around after flight. Attributed to an undetected progressive breakdown, not an ammunition fault.	2010-03-21
CEFCOM	Accidental discharge of Grenade Hand Fragmentation.	2010-03-24
CEFCOM	Accidental discharge. Two rounds fired from pistol while preparing to board a helicopter.	2010-03-25
CLS	Premature explosion of 14.5mm sub-calibre artillery trainer.	2010-04-06
CAS	Fire bottle accidently discharged while undergoing replacement. Technician failed to carry out a “no volts” test.	2010-04-07
CMS	While under tow by tug in harbour, work crew transferred contents of demolitions locker in the torpedo magazine to the starboard torpedo ready use locker in the hangar. This was done without conducting a risk assessment and without FAI clearance.	2010-04-13
CAS	Serial numbers were improperly recorded concerning cartridges on an ejection seat.	2010-04-15

L1 OR COMMAND RESPONSIBLE FOR REPORTING	2010 INCIDENT SUMMARY	DATE
CAS	Fire Bottle discharged during a maintenance system check. Technician crew failed to disconnect second fire bottle.	2010-04-23
CAS	During installation of tail probe cartridge, the hoist cartridge was accidently fired. Attributed to Human Error in that the techs followed the wrong checklist procedure (also complacency).	2010-04-23
CLS	Theft of .22 cal ammunition from range by Cadets.	2010-05-02
CAS	Aircraft was towed to hangar 216, bay 5 with a loaded gun.	2010-05-03
CEFCOM	On final approach the crew forgot to put the ASE system to safe (as required in the pre-landing check). AC Commander was distracted by fuel issue. Flares were inadvertently released over the FOB (at least 4 flares).	2010-05-10
CAS	Two hung MPBs were discovered at the de-arm point.	2010-05-11
CAS	C-6 machineguns were returned on completion of exercise. The following day as they were being re-issued, a 7.62 mm Ball round was discovered in the chamber of one gun.	2010-05-12
CAS	While carrying out A-Check, technician discovered SMDC line gouged.	2010-05-12
CAS	Expired cartridges (6 of 8) discovered during functional check of LAU 116 station. Attributed to communication error in that message authorizing life extension was not clear and had been misinterpreted.	2010-05-14
CAS	During serial number verification of an AIM 9 missile, the serial number was corrected. During correction it was discovered that this missile was overflown by 29 days. Attributed to Human Error in that the technician failed to enter the correct number.	2010-05-17
CLS	CF munitions scrap located in Bull Lake Salvage by UXO Program.	2010-05-18
CLS	While sorting salvage returned after a grenade range, the Salvage Supervisor discovered a live Grenade Hand Fragmentation C13 mixed in with the salvage. Stores had not been properly checked/verified FFE by RSO.	2010-05-19
CAS	Un-commanded chaff/flare release, attributed to undetected progressive breakdown.	2010-05-20
CAS	During pre-flight walk around, pilot noticed that the cartridge retainer visual indicators were not extended. Further inspection revealed that the cartridges were not installed to the specified torque value.	2010-05-20
CAS	During strafing run, 20mm rounds impacted about 800 metres short of target. Attributed to Human Error. Pilot did not understand the visual clues of the reticule and also that the mission planning/brief did not include the differences between an overhead and a blunt attack.	2010-05-24
CAS	During SAR training, a C2 Smoke MLM landed approximately 50 feet from a fishing vessel.	2010-05-25
CAS	During unload, load crew unloaded bullets while paperwork indicated that the gun had been loaded with ballast.	2010-05-26
CAS	During flight it was discovered that the aircraft indicated 54 chaff when 30 chaff and 30 flares had been loaded.	2010-05-27
CAS	At end of EXERCISE MAPLE FLAG, visiting Special Forces left behind numerous rounds of 5.56 and 7.62mm ammunition. Ammunition had been secured in a sea container. Container had not been licensed as a storage location.	2010-05-28

L1 OR COMMAND RESPONSIBLE FOR REPORTING	2010 INCIDENT SUMMARY	DATE
CMS	During watch turnover, the force protection leader mustered all magazines and noted that one round of 5.56mm Ball was missing. It was assumed to have fallen from the magazine while kept in the sentry's pocket. Search was unsuccessful. At later muster, an additional round was found in another magazine.	2010-05-30
CEFCOM	Unsecured sea container with no outer markings was discovered in the TNASP marshalling yard. It contained 18,000 rounds 25mm packed in cans that were not palletized. There were two black plastic tri-walls which contained various other ammunition items, also improperly packaged.	2010-05-31
CAS	One MPB would not drop after multiple attempts.	2010-06-01
CLS	A member of the training staff attempted to throw a Thunderflash without completely removing the sealing tape. The tape stuck to the thrower's hand and Thunderflash landed 2 metres from a student.	2010-06-02
CMS	During ammunition muster an overage of 660 rounds 5.56mm Ball and 330 rounds 20mm CIWS Dummy was discovered.	2010-06-03
CAS	One spent casing was recovered from gun during cycling of dummy rounds at second level maintenance. Attributed to Human Error in that crew failed to leave enough space between first bullet and feeder unit, as well as attention deficiencies due to sustained attention over time.	2010-06-03
CLS	Pyrotechnics recovered from member's home as a result of report from moving company.	2010-06-04
CAS	During a survey to ensure no HAZMAT or explosives issues existed, it was noted that there appeared to be a 500 lb bomb under some tires and debris. Olive drab body paint and yellow stencilling were visible. On closer examination small stampings were discovered on the tail of the bomb stating that it was inert. Further examination of museum records and on the EOD range indicated that the item was inert, but had not been properly marked.	2010-06-04
CMS	Boat pack left in RHIB when delivered to contractor.	2010-06-04
CMS	Theft of cadet weapons and .22 ammunition from properly secured storage unit/lock-up.	2010-06-06
CLS	While firing his C8 utilizing single shot rapid fire, member felt pressure blow back in his face. He canted weapon and noted magazine innards were hanging from the bottom of the magazine and the bolt was fully forward. Cause under investigation.	2010-06-11
CAS	Unauthorized explosives activity occurred at Shaver Lake Range while area was in use for training mission. Two aircraft were potentially at risk. Attributed to tight timeframe allocated to EOD Team for destruction purposes and lack of synchronization of time pieces with range control.	2010-06-15
CEFCOM	C4 and blasting caps discovered by Skylink personnel inside a triwall intended for air transportation.	2010-06-16
CAS	Ground Incident: 20mm round left in gun. Unload had occurred at night, assisted with a flashlight and first round was missed.	2010-06-16
CLS	A 5.56 mm Ball round was recovered from a magazine at ENDEX. Magazines had been loaded by another member and should have contained only Blank rounds. Attributed to inattention on part of member who charged the magazines and also to level of control/ supervision applied within unit.	2010-06-17
CEFCOM	Majority of the load on a flatbed shifted – some of load had been expelled from its packaging. Load had not been sufficiently secured.	2010-06-18

L1 OR COMMAND RESPONSIBLE FOR REPORTING	2010 INCIDENT SUMMARY	DATE
CMS	After each firing it was observed that an excessive amount of debris would fall out of the breech when the empty casing was extracted. In one case, debris landed on a member's NCDS causing the jacket fabric to melt and producing holes in the jacket and pants. Report cited four other such incidents.	2010-06-20
CLS	Four ammunition duds were found among the unit salvage return. Return had been certified FFE by unit member.	2010-06-21
CEFCOM	Fire bottle mistakenly discharged when technician demonstrating pulled the fire handle instead of pointing and explaining.	2010-06-22
CMS	Three rounds 76mm jettisoned at sea after being damaged in weapon system.	2010-06-23
CAS	Inadvertent flare release: pilot was late with fence check-out and inadvertently bumped the flare switch, dispensing flares outside range area.	2010-06-24
CAS	Flares were dispensed outside the air weapons range. Student pilot was saturated and not able to complete fence out check procedures. Attributed to task overload.	2010-06-24
CMS	A crack and slight deformity were noticed in an expended casing while conducting saluting gun training. Round had been fired 22 Jun 10 as one of 20. No other casings showed deformity or damage. Guns were inspected and found serviceable. Casing defect suspected.	2010-06-27
CMS	While conducting saluting gun training with gun elevated at 45 degrees, excessive debris was observed to fall from the breech when the empty casings were extracted.	2010-06-29
CMS	Second incidence of a cracked casing being observed in an expended 6 Pdr casing.	2010-06-29
CLS	Military member with ammunition in his baggage was detained at Fredericton airport.	2010-06-30
CAS	GBU 12 D/B released in error. Pilot selected wrong weapon – should have been MPB. Attributed to attention failure on part of pilot and task overload.	2010-06-30
CMS	Insufficient recuperator pressure caused 76mm round to fail to fire. Round separated during extraction and was jettisoned.	2010-07-01
CAS	During a CAS dive attack, two MPB were released but only one was commanded by SMS. Investigation could not attribute second release, but did reveal errors on part of load crew.	2010-07-06
CMS	Further split 6 Pdr casings found among previously fired casings.	2010-07-07
CMS	Further split 6 Pdr casings found among previously fired casings (Second occurrence).	2010-07-07
CAS	Licence violation. QRA used for transit/storage for outgoing shipment under licence that pre-dated current use of area as QRA.	2010-07-12
CMS	SHIELD indicated misfire on barrel 17 on starboard side. After 30 minutes, round was jettisoned. Cause of failure is unknown, but ship had been advised that this lot had previously been exposed to salt water.	2010-07-17
CLS	During clearing of amnesty box, it was discovered that the hasp pin had been tampered, with the possibility of theft of amnesty box contents. Boxes being modified to prevent hasp pin removal.	2010-07-20
CLS	Two members detained at airport screening for ammunition in their baggage.	2010-07-21
CAS	GAU21 link chute became deformed and caused links to build up in chute. Eventually weight of chute was such that the chute detached, spilling links and live rounds over the side. Attributed to lack of extra support mid-chute.	2010-07-21

L1 OR COMMAND RESPONSIBLE FOR REPORTING	2010 INCIDENT SUMMARY	DATE
CAS	EOD Team responded to call from RCMP to destroy a World War II souvenir – a hand grenade.	2010-07-22
CMS	SOLAS transfer halted as vehicle dispatched for detail was carrying gasoline from a previous detail.	2010-07-22
CAS	During removal of SMDC line a technician noticed that two SMDC lines were bent and scored. Damage suspected to have occurred during installation in Feb 2006.	2010-07-23
CMS	OOD mistakenly issued small arms ammunition lock-up key to small arms custodian (not an authorized holder).	2010-07-27
CAS	Discharged fire extinguisher bottle. Technician carried out functional check on replaced bottle without shorting the other bottle, causing the other bottle to discharge.	2010-07-29
CAS	Maintenance-servicing. Incorrectly marked CCU 45 impulse cartridge due dates were discovered. They were past the correct installed due date. Resulted from improper understanding of message	2010-07-29
CLS	Two members stopped at airport screening for ammunition in their baggage.	2010-08-04
CEFCOM	Inadvertent discharge of flares. During the "fence in" check the NFP did not move the ASE switch to safe, therefore as they taxied back to the ramp flares were ejected.	2010-08-05
CANSOFCOM	During training on foreign weapon, weapon fired on forward action of the bolt.	2010-08-08
CAS	Canopy TLX line was broken during canopy removal. During removal process the technician had been interrupted and failed to document his progress. On recommencing procedure, he missed critical steps.	2010-08-09
CAS	TLX line was found smoking by technicians preparing aircraft for seat modification. The canopy was acting as a magnifying glass. Attributed as an isolated incident due to the environment.	2010-08-09
CLS	Edmonton police recovered a car that had been stolen from a member. Inside car police found a block of C4.	2010-08-16
CLS	Member in possession of 25mm dummy round was stopped at airport. Member had found the round in the turret ring of a vehicle on loan to unit.	2010-08-17
CAS	Chaff and flare pod damaged during aircraft loading when the pod was dropped. Pod was set aside for return to armament, but then forgotten for several hours. 30 flares were eventually destroyed.	2010-08-17
CLS	Member had an accidental discharge that may have landed in a public area. Search revealed no injuries or damage.	2010-08-24
CLS	During MP search and seizure operation, three pyrotechnic items were recovered.	2010-08-27
CLS	Seven live pyrotechnic items were found mixed in with salvage when salvage was being processed. Bags were all from the same course and had been signed by the course WO.	2010-08-30
CAS	Aircraft bomb failed to explode on impact. Bomb rack cartridges and fired and arming wires appeared to have operated correctly. Attributed to undetected progressive breakdown.	2010-08-31
CMS	Direction issued to replace Torpedo Launch Controller cables – cables improperly routed through magazine.	2010-09-01
CAS	Aircraft bomb failed to detonate on impact; bomb rack cartridges had fired and arming wires appear to have operated correctly. Attributed to undetected progressive breakdown.	2010-09-01

L1 OR COMMAND RESPONSIBLE FOR REPORTING	2010 INCIDENT SUMMARY	DATE
CAS	During Close Air Support task and under control of a FAC, pilot misidentified the target and dropped a 500 lb bomb on an incorrect target which was closer to friendly forces. Attributed to pilot error.	2010-09-02
CMS	Gun malfunction resulted in damage to three rounds 57mm BLP.	2010-09-02
CAS	Aircraft bomb hit target but failed to detonate. Attributed to undetected progressive breakdown.	2010-09-04
CAS	Aircraft bomb failed to detonate on impact: bomb rack cartridges and arming wires appeared to operate correctly (third of four occurrences in one week).	2010-09-04
CAS	Halon discharge due to APU fire control switch being left on when breakers were reset.	2010-09-04
CAS	Aircraft bomb hit target but failed to detonate. Attributed to undetected progressive breakdown.	2010-09-06
CAS	Aircraft bomb failed to detonate on impact: bomb rack cartridges and arming wires appear to have operated correctly (fourth of four incidents in one week).	2010-09-06
CAS	Improper storage of pencil flares subsequent to return from OP SABOT. Crew left flares with other equipment on a cart without declaring their presence and desk NCO did not examine cart before securing area.	2010-09-07
CAS	LAU-116 was damaged during loading operations: station-6 LAU116 aft stop trigger was broken during seating of missile onto launcher.	2010-09-07
CLS	Civilian turned in ammunition items left behind in home after CF member moved out.	2010-09-12
CLS	When emptying the amnesty box located adjacent to transient quarters D25, several items were discovered that appeared to have been burned. Further investigation revealed that someone had lit paper and pushed it into the amnesty box. Vandalism.	2010-09-14
CMP	Range Control was inappropriately collecting and storing various duds.	2010-09-16
CAS	Aircraft transported live AIM-9 missile to Inuvik where it was transferred to another aircraft. While updating MRS it was discovered that aircraft had flown with an open CF-543.	2010-09-19
CAS	Aircraft carrying AIM-9 live missile flew with open CF-543. Attributed to perceptual error and failure of load crew chief to confirm serviceability of weapon.	2010-09-19
CAS	During ACM pilot fired off 30 chaff and flares and such was indicated in cockpit; however, only 26 flares actually were fired. During investigation one of two guide pins fell out of the dispenser when it was removed from the flare magazine.	2010-09-20
CAS	Aircraft bomb failed to release from aircraft when selected. Investigation revealed a faulty electronic card.	2010-09-23
Canada COM	RCMP received a report of blank, linked cartridges found nearby. RCMP recovered ammunition and turned it over to ASU personnel.	2010-09-28
CMS	During loading of guided missile cell into launcher, safe/operate lever padlock was not initially secured. Fault noticed and corrected by safety staff.	2010-09-29
CMS	While missile cell was being lowered into position, it came into contact with the securing locks, shearing off 2 nylon protective pads. There was no other damage and positioning continued at a slower speed.	2010-09-29
CAS	During flight pilot fired off all chaff and flares, but landed with 5 flares remaining.	2010-09-29
CMS	Some 20mm tungsten ammunition for CIWS was possibly exposed to high frequency radiation.	2010-09-30

L1 OR COMMAND RESPONSIBLE FOR REPORTING	2010 INCIDENT SUMMARY	DATE
CAS	Commercial transport vehicle delivered explosives to base. Vehicle was not carrying placards and was carrying a mixed load.	2010-10-05
CAS	Technician removing ejection seat made a procedural error, causing the donor to fire. Technician had been asked to conduct the removal "as a favour" due to lack of personnel. Technician did not review procedures prior to starting removal.	2010-10-05
CLS	Various pyrotechnics and SAA recovered from the private residence of a deceased member.	2010-10-06
CAS	Torpedo dropped correctly, but torpedo did not run. Arming wire was found broken. Attributed to undetected progressive breakdown in that the arming cable is re-used on exercise torpedoes.	2010-10-06
CMS	Signal Distress Day/Night lost during dive due to faulty zipper on dive suit.	2010-10-09
CAS	During launch of flare from aircraft, ACSO erred in drill while hooking flare arming knob to the lanyard cable. While lifting the flare to an upright position he unknowingly stepped on the flare lanyard forcing the timer knob to be pulled off. As a result the parachute was expelled while still on the ramp.	2010-10-13
CAS	On return from training mission with load of chaff and flares (loaded for use during a subsequent mission), pilot failed to proceed through the de-arm point prior to returning to maintenance ramp.	2010-10-15
CAS	AIM 9 missile tested "NO TONE" on station. Electrical cable connecting missile to LAU-7 was disconnected due to shearing of 3 screws that secure the cable to the missile.	2010-10-17
CMS	Vertical Launched Sea Sparrow ESSM fired and appeared to function correctly. On removing canister and exhaust covers, it was discovered that the umbilical connector was no longer attached to the cable inside the canister. Technical investigation was initiated by the LCMM.	2010-10-18
CMS	During ammunition muster, one flare was discovered missing. Investigation determined accounting error as the likely cause.	2010-10-19
CANOSCOM	A .223 Winchester round caused C9 weapon to jam. Round was in a belt of 5.56mm Ball C77 Linked.	2010-10-24
CANOSCOM	Mechanical failure in water system resulted in flooding of Magazine 48. No damage to ammunition, other than wetting of wooden boxes.	2010-10-27
CLS	Member intercepted at airport when one round discovered in his baggage. Round was in his tactical vest.	2010-10-28
CMS	While unloading the 57mm gun mount, one round released from the clip and dropped to the deck, about 18 inches.	2010-11-01
CMS	Maintenance date for Harpoon Missile was exceeded.	2010-11-01
CAS	Improper storage of a 30-06 rifle and ammunition (survival equipment) while aircraft undergoing maintenance.	2010-11-01
CAS	Bomb was delivered under normal parameters and DDI indicated release; however, bomb was not released. Attributed to failure of intervalometer. New digital intervalometer is in procurement.	2010-11-02
CAS	Bomb was delivered under normal parameters. Battle Damage Assessment was conducted, but failed to note that a multi-purpose bomb was still attached. Attributed to failure of intervalometer. Digital intervalometer is in procurement.	2010-11-02
CAS	Survival pyrotechnics were not removed from boats stored in the hangar for the winter.	2010-11-02

L1 OR COMMAND RESPONSIBLE FOR REPORTING	2010 INCIDENT SUMMARY	DATE
CAS	Confusion over an Ammunition Restriction led to issue of quarantined ammunition to operational units. Potential for case neck separation was reason for restriction.	2010-11-04
CAS	Report of lost 16mm Flares during return from OP HESTIA. Probable location is CFB Trenton. Items are potentially improperly stored.	2010-11-05
CLS	Reserve Force member intercepted at airport screening with one box of blank rounds in his possession.	2010-11-05
CLS	Member intercepted at airport screening with ammunition in his baggage.	2010-11-05
CLS	Pilot failed to mark all active ranges on his map prior to mission and as a result later flew over an active range.	2010-11-15
CAS	During recovery operations for a downed aircraft, EOD team arrived to conduct RSP of seat only to find that an unauthorized person had already operated the manual override handle.	2010-11-20
CMS	During dive, a Signal Distress Day/Night was lost, but not noticed/reported to ammunition officer of magazine custodian. Ship's dive box was secured in the pyrotechnics locker until the next day.	2010-11-20
CMS	Member of ship's company purchased and brought aboard ammunition for personal use. After overnight storage in small arms magazine, ammunition was properly stored in metal ammunition container.	2010-11-20
CLS	When performing a re-issue check on a C7 rifle previously used for urban operations training, the technician discovered a live, damaged, 9mm Simunition round in the barrel (primer first).	2010-11-23
CMS	After ship had been declared Free From Explosives, two Signal Distress Day and Night were found in the ship's dive locker.	2010-11-24
CLS	Vehicle carrying small amount of ammunition slid into a ditch, cargo shifted and three Thunderflashes were damaged.	2010-11-24
CAS	Gun casing bag was lost from aircraft when rivets separated. Suspect rivets were installed with only hand pressure.	2010-11-24
CMS	During seamanship evolutions, crew member accidently deployed the Marker Man Overboard when a rope attached to the RHIB tangled with the Marker.	2010-11-25
CAS	Technician slipped on ice, fell and full chaff/flare pod he was carrying fell on him, then onto the ground.	2010-11-25
CMS	Ship received temporary permission to store POL barrels on missile deck. Waiver expired 15 November; however four barrels were still on missile deck 29 November 2010.	2010-11-29
CMS	A 57mm ammunition magazine door found shut, dogged, but not locked during security rounds. Custodian failed to secure properly. No evidence of theft or tampering.	2010-12-01
CEFCOM	During an overwatch mission, flares were ejected. One flare did not travel as far as expected. Gunner then noticed a flame originating from the flare tube. Flame lasted 10–15 seconds, with sparking observed within the tube for a further 10 seconds. Inspection on the ground revealed the flare was partially burned.	2010-12-06
CEFCOM	Fire bottle cartridges found to be improperly installed.	2010-12-06
CMS	During a 57mm shoot, a misfired occurred. Investigation revealed primer had been struck. Round was jettisoned. Mechanical gun failure suspected.	2010-12-09
CMS	A 76mm gun jammed during firing. Case/projectile separation occurred during clearing. Projectile jettisoned. Second jam resulted in another separation and jettisoning.	2010-12-09

L1 OR COMMAND RESPONSIBLE FOR REPORTING	2010 INCIDENT SUMMARY	DATE
CMS	During 57mm trial, two apprentice NWTs were assigned to prepare DUMMY ammunition for functional trial. Apprentices mistakenly selected BLP ammunition and were in process of removing a clip of rounds when error discovered.	2010-12-14
CMS	A 9mm magazine and eight rounds found unsecured in an empty ammunition box on the bridge. Had been left unsecured since a duty watch in a foreign port. Poor unit control of ammunition.	2010-12-17
CLS	Civilian police raided a gunsmith and seized presumed military ammunition. Gunsmith is a brother of a Reservist. Investigation being conducted as to source of ammunition seized – possible theft.	2010-12-22

Note 1. Summary includes data originally reported in FSOMS.
Note 2. Greyed out cells indicate deliberate deviations.

ANNEX C

STATUS OF MAIN UXO PROGRAM AND LEGACY SITES FOR 2010

Canadian Ranger Gary Kalluk fires the C9 Light Machine Gun during a live-fire range exercise in Resolute Bay, Nunavut in March 2009.

The full extent of UXO risk management activities, including site reconnaissance, UXO avoidance, site characterization, clearance and public information sessions, were conducted at legacy sites across Canada in 2010. Risk management activities were conducted at 22 sites that were previously recognized. Immediate risk mitigation and support was conducted at 12 additional sites that arose as a result of new information (e.g., inquiries, notification, historical research, etc.). The table below describes these sites, including the legacy issues and risk management activities.

SITE NAME	LEGACY ISSUE	ACTIVITIES CONDUCTED IN 2010 AND PLANNED ACTIVITIES
Burtch, ON	Burtch, ON was part of the British Commonwealth Air Training Plan (BCATP) during WWII. The land was transferred to the Six Nations in 2006.	■ Site reconnaissance complete ■ Communications activities complete
Cape Porcupine, NL	Location of 1949 marine amphibious exercised conducted by the US Military. Dunnite (ammonium picrate found on shoreline in 2008 by nearby residents.	■ Surface sweep completed ■ On-going communications activities

SITE NAME	LEGACY ISSUE	ACTIVITIES CONDUCTED IN 2010 AND PLANNED ACTIVITIES
Churchill, MB	The Churchill area was historically used for live-fire training at multiple ranges.	■ Site reconnaissance complete ■ On-going communications activities ■ On-going risk management activities ■ Planned shoreline sweeps and site characterization
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
Granby, QC	Former WWII munitions factory, including some munitions testing activities. Munitions debris have been found at the site.	■ Limited site characterization ■ On-going surface clearance ■ Final site characterization ■ Clearance support for construction support ■ Communications activities (school program)
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 communications activities
HMCS Thiepval, BC	Battle class converted trawler shipwreck off the coast of British Columbia.	■ Planned site characterization ■ On-going communications activities
Kamloops, BC	Former RCAF ammunition depot. Buried munitions were identified at the site.	■ Site reconnaissance complete ■ On-going site characterization ■ On-going communications activities ■ Planned scrap sifting/screening activities and geophysical survey
Lac Saint-Pierre, QC	Former munitions testing facility located on the St. Lawrence. One confirmed UXO related death in 1982.	■ On-going shoreline sweeps ■ On-going site characterization ■ On-going communications activities ■ Construction support ■ UXO avoidance ■ Water-based clearance
Lethbridge, AB	Scrap metal recycling facility; approximately 500 tonnes of munitions scrap was identified at the site.	■ Scrap screening and removal complete. A total of 39 live or suspect items found – 14 HE rounds, of which 5 HE rounds having an NEQ greater than 500 grams (Karl Gustav).
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 ■ On-going communications activities
Medicine Hat, AB	Scrap metal recycling facilities; approximately 365 tonnes of munitions scrap was identified at the sites.	■ On-going scrap screening and removal. A total of 23 items of pyrotechnics, 14 HE filled rounds and 2 inert projectiles were found.
Melbourne, ON	Former British Commonwealth Air Training Plan (BCATP) site. Potentially 200 Ha of UXO affected property situated on First Nations Land in a proposed residential development.	■ On-going communications activities ■ Environmental sampling complete ■ Site characterization planned
Port of Gaspé, QC	Former naval coastal defence site at which the potential presence of munitions is possible.	■ Site reconnaissance complete ■ Completed risk assessment activities

SITE NAME	LEGACY ISSUE	ACTIVITIES CONDUCTED IN 2010 AND PLANNED ACTIVITIES
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 communications activities ■ On-going surface sweeps
Réserve Faunique des Laurentides, QC	Rocket pods were encountered by a local resident. The items were likely jettisoned or part of a crash site.	■ Site reconnaissance complete ■ On-going communications activities
Rivers, MB	Former Canadian Forces Base. Total of 26 Ha adjacent to airstrip cleared after civilian injury in 2007.	■ On-going communications activities ■ Survey and clearance activities complete ■ On-going risk management activities
Roger's Pass, AB	Support to Operation PALACI Avalanche Control Program between DND and Parks Canada.	■ Site reconnaissance complete ■ On-going clearance support provided annually
Shelburne Shipyards, NS	Former naval shipyard facility presently undergoing modernization. Possible existence of munitions reported, as suspect munitions items were observed.	■ Site reconnaissance complete ■ Site characterization completed ■ Planned construction support
Shilo, MB	The site of military activity in the region since 1910.	■ Site reconnaissance complete ■ Planned site characterization ■ Planned communications activities
SS Claire Lilly, NS	Munitions transport shipwreck off the coast of Nova Scotia.	■ Site characterization completed ■ On-going communications activities
SS PLM 27, NL	Carrier shipwreck off the coast of Newfoundland.	■ Planned site characterization
SS Saganaga, NL	Carrier shipwreck off the coast of Newfoundland.	■ Planned site characterization
Teslin-Nisutlin Delta, YT	Nisutlin Bay was used as a high explosive (HE) bombing range by DND in the early 1950s.	■ On-going historical research ■ On-going communications activities ■ Planned risk management activities
Tofino Airport/ Tlo-o-qui-aht First Nation	Used during WWII as an airfield, coastal defence site and munitions depot. There are numerous former ranges in the area, including bombing, strafing, light anti-aircraft ranges.	■ Site reconnaissance complete ■ On-going communications activities
Tracadie, NB	Former military range undergoing recurring review, as previously cleared lands have residual UXO risk.	■ On-going site characterization ■ On-going communications activities
TTN First Nations, AB	A total of 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 communications and education activities ■ Clearance support for local construction
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
Vernon, BC	Total of 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 communications activities ■ Remote sensing survey (ortho LIDAR) planned

SITE NAME	LEGACY ISSUE	ACTIVITIES CONDUCTED IN 2010 AND PLANNED ACTIVITIES
Watson Lake, YT	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 communications activities
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 complete ■ On-going communications activities
Wrights Cove, NS	Property in the vicinity of the 1945 Bedford Magazine explosion site.	■ On-going risk assessment activities
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 communications activities ■ On-going risk management activities ■ Planned UXO clearance operation

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