

5

Stockpile Management: Accounting James Bevan

Overview

Ammunition accounting refers to information management systems and the associated operating procedures that are designed to record, numerically monitor,¹ verify, issue, and receive ammunition in stockpiles.

Accurate accounting of stockpiles is an essential control measure in stockpile management and security, one that can quickly identify stockpile losses or inaccuracies resulting from misplaced munitions, and wrongly issued or illicitly diverted stocks.

Comprehensive accounting procedures are also a core component of effective technical surveillance of ammunition. When used to record physical inspection reports, they facilitate the management of unstable ammunition and thereby help to minimize the risks of explosion.

Maintaining a comprehensive national stockpile inventory

Stockpile safety and security apply to all state security force stocks of ammunition within a given country. These stocks, which encompass those of militaries, police forces, and other government agencies, can together be termed the 'national stockpile'.²

They comprise operational ammunition stocks (used to support routine operations), war reserve ammunition, training ammunition, experimental ammunition, ammunition at the point of manufacture, and ammunition awaiting disposal (Wilkinson, 2006, p. 232). Effective accounting procedures need to apply to all these categories of ammunition if states are to keep risks to safety and security within acceptable limits and maximize the efficient use of the national stockpile.

As Table 5.1 illustrates, accounting is a core component of most stockpile management and security procedures. It can be roughly divided into two broad activities, contributing to the safety of stocks (i.e. minimizing the risk of explosion) and maintaining security (i.e. minimizing the risk of loss or diversion that could result in ammunition entering the illicit market). Accurate accounting of the national stockpile therefore necessitates the classification of ammunition for the purposes of monitoring: 1) the physical and chemical condition of stocks; and 2) the necessary measures required to secure particular types of stocks from loss or theft.

Table 5.1

The pivotal role of accounting in stockpile and security activities

Stockpile management and security activity	Role of effective accounting procedures
Determination of required stockpile levels	<ul style="list-style-type: none"> • Sustains accurate records of types and quantities of ammunition stocked. • Comprises a balance sheet of ammunition acquisition and consumption for the purposes of forecasting required stock levels.
Recording location of stockpiles	<ul style="list-style-type: none"> • Provides information on the physical properties of ammunition types and their storage requirements. • Records the physical location of stocks, whether in a permanent facility or in transit.
Financial management of stockpiles	<ul style="list-style-type: none"> • Facilitates rapid analysis of acquisition, storage, transfer, and disposal costs. • Aids identification of existing stocks that could be used as a substitute for new purchases.
Safe-keeping, storage, and transport of ammunition	<ul style="list-style-type: none"> • Allows easy identification of handling and storage protocols for specific types of ammunition. • Classifies stocks according to the results of physical inspection and chemical analysis of stability.
Ensuring security of stockpiles	<ul style="list-style-type: none"> • Provides a regularly audited balance of stocks against which to identify potential losses and theft. • Facilitates the detection of illicit diversion by recording all transits and persons/units responsible for transportation.
Disposal, demilitarization, and destruction of surplus stocks	<ul style="list-style-type: none"> • Records the status of ammunition awaiting disposal, demilitarization, or destruction. • Provides a means of verifying whether surplus stocks have been destroyed or not.

Recording the physical and chemical condition of stocks

Ensuring the safety and stability of ammunition and explosives requires an ammunition surveillance system (CHAPTER 6) that involves the periodic physical inspection and chemical analysis of stocks by trained personnel. Accounting procedures are a critical part of this surveillance system, because they enable personnel to classify stocks of ammunition according to their stability and to assess potential risks to safety and reliability.

Because the shelf life of ammunition is often no indicator of the explosive risks it can pose when unstable,³ personnel allocate codes that describe the condition and specify the treatment of ammunition. While these codes differ from country to country, they always distinguish between operational ammunition that is deemed safe and reliable to use; ammunition that is subject to further physical inspection and reclassification; and redundant ammunition that has been verified as unstable, unreliable, or subject to destruction. Box 5.1 is based on the United Kingdom's classification system, which incorporates all of the classification strata mentioned above.

Box 5.1 A classification system for national ammunition stockpiles (based on the system currently used in the United Kingdom)

Classification of ammunition condition:

Condition A: Serviceable stocks available for use

Condition B: Stocks banned from use pending a technical investigation

- B1 – Unrestricted handling and movement
- B2 – Subject to handling or movement constraint
- B3 – Applicable to certain lot and batch numbers only
- B4 – Shelf life expired

Condition C: Stocks unavailable for use pending technical inspection, repair, modification, or test

- C1 – Minor processing or repair required
- C2 – Major processing or repair required
- C3 – Awaiting inspection only
- C4 – Awaiting manufacturer's processing or repair

Condition D: Stocks for disposal

- D1 – Surplus but serviceable stocks
- D2 – Unserviceable stocks

Source: SEESAC (2006a, p. 3)

The failure to institute effective accounting procedures can result in the misclassification or improper storage and transport of stocks, leading to potential risks of explosion (CHAPTER 13).

Security measures particular to certain types of ammunition

A stockpile security risk (CHAPTER 7) can, in part, be defined as the potential for ammunition to enter the illicit market, whether by theft or loss from state stocks (CHAPTER 15). Effective accounting procedures are used to rapidly identify the theft of ammunition stocks and monitor for possible breaches in security.

These accounting procedures serve at least three security-enhancing functions by: 1) providing an accurate and up-to-date inventory of ammunition, which can be used as a baseline from which to detect theft or loss; 2) documenting the movement of ammunition and persons handling it to ensure accountability and prevent theft; and 3) prioritizing security measures for types of ammunition that could pose a particularly acute and immediate security risk should they fall into the wrong hands.

Accurate and audited inventories

Maintaining accurate inventories requires certain basic accounting procedures. As a prerequisite to accurate inventory keeping, stockpiles need to be thoroughly documented. Each item should, at minimum, be uniquely registered by type, lot, and/or batch number (CHAPTER 3); storage site; and location within that site.

A computerized and networked inventory system, developed to meet the needs of a particular country, is the most effective option. Such systems greatly facilitate accounting and audit procedures because data is easily accessible and can be recovered rapidly. In addition, computerized systems facilitate easy identification of:

- stockpile quantities, whether aggregate or disaggregated by type and category;
- protocols relating to the storage and transport of certain types of ammunition;
- the financial value of stocks and the costs of storage; and
- the shelf life of ammunition and results of physical and chemical inspections.

If the development of such a system is not feasible, paper-based accounting systems can also be very effective—although they are more labour-intensive

and time-consuming than computerized inventories. Whether states opt for one system or the other, backup records should be kept at a separate location in case of fire or explosion and the potential need to reinventory stocks or assess risks in the event of such a disaster (OSCE, 2003a, p. 7).

Inventory records should also be subject to periodic auditing, which must also be combined with routine physical inventories to assess the veracity of records against the physical presence of ammunition. The Organization for Security and Co-operation in Europe, for instance, specifies that records should ideally be inspected at least once every six months (OSCE, 2003a, p. 8). It is clear, however, that more frequent auditing has the potential to uncover loss or theft of stocks in a timelier manner; indeed, many nations employ a 'rolling' (continuous) stocktaking system.

Certain countries specify differing auditing intervals, depending on the location of the stocks. Operation ammunition that is deployed with security force units, for instance, may be more frequently targeted for audit under the rationale that it may be more susceptible to loss (CHAPTER 15) than ammunition held in dedicated storage depots (USDoD, 2000, p. 31).

Any irregularities revealed in audits and stocktaking must be acted upon immediately. Discrepancies between physical inventories and the accounted balance that cannot be reconciled should be made the subject of 'missing/lost' reports and should initiate prompt investigative action (OSCE, 2003a, p. 8; 2003b, p. 4).

Accountability related to the movement of ammunition

All transactions (inflows and outflows of ammunition) that affect the balance of a stockpile need to be recorded. For the purposes of verifying transfers, this information should include: the type, lot number, and classification of the ammunition in question; the destination (whether within a stockpile facility or leaving the premises); and the person(s) responsible for handling the ammunition and recording its transfer.

In addition, a number of checks and balances can be instituted to ensure that the same stock management personnel are not simultaneously responsible for storekeeping, accounting, and auditing. These measures, which could be described as a 'separation of powers', are an important means of discouraging theft and illicit diversion.

Such measures can include prohibitions on individual responsibility for both physically verifying the transfer of ammunition and compiling records of ammunition transactions. In the case of the United States, personnel tasked with storage functions are not allowed access to records. Similarly, record-keeping personnel are prohibited from conducting physical inventories without the supervision of storage personnel (USDoD, 2002, p. 8). These procedures also ensure that law-abiding personnel are better protected from blame should a loss or theft occur.

Prioritizing the security of certain types of ammunition

Different varieties of ammunition and their component parts present different security risks if they are lost or stolen from stockpiles. These risks are proportional to: 1) the operational (i.e. tactical and destructive) potential of the ammunition in question; and 2) the ease and speed with which persons illicitly acquiring the ammunition can make it operational and use it. While it is clear that all ammunition poses risks to security when in the wrong hands, certain states have attempted to prioritize risks for different types of ammunition and allocate specific security measures accordingly.

For these reasons, the US Department of Defense (USDoD, 1989, p. 30) classifies conventional ammunition according to 'the degree of protection needed against loss or theft by terrorists or other criminal elements'. As a result, the USDoD ranks ammunition higher in sensitivity (see Table 5.2) when it is explosive, can threaten high value military assets, and can be deployed quickly. In this system, category denotes risk (with Category I being the highest) and code indicates the degree of protection required (with Code 1 being the highest).

For example, Code 1 munitions include man-portable air defence systems and anti-tank guided weapons that are either stored or transported as a complete system (missile and launcher) or sufficiently proximate to one another to enable quick assembly into a functioning weapons system. Code 2 ammunition includes explosive munitions that are either ready to use (such as grenades and mines) or could be improvised for other purposes (such as raw explosives and missiles) (CHAPTER 14). All of these weapons could either be used quickly and with great effect or used in weapons already circulating on the illicit market.

Table 5.2

US military ammunition and explosives security risk codes

Code	Designation	Category of ammunition included
1	HIGHEST SENSITIVITY	<p>Category I Ready-to-fire (ammunition and weapon) missiles, including Hamlet, Redeye, Stinger, Dragon, LAW, and Viper. This category includes non-nuclear missiles and rockets in a <i>ready-to-fire configuration</i>. It also applies when the launcher (tube) and the associated explosive rounds, though not in a ready-to-fire configuration, are stored or transported together.</p>
2	HIGH SENSITIVITY	<p>Category II (a) Grenades, both high explosive and white phosphorous. (b) Anti-tank and anti-personnel mines with an unpacked weight of 100 pounds or less each. (c) Explosives used in demolition operations, such as C-4, military dynamite, TNT, and the like. (d) Explosive rounds for missiles and rockets other than Category I that have an unpacked weight of 100 pounds or less each.</p>
3	MODERATE SENSITIVITY	<p>Category III (a) Ammunition, .50 calibre and larger, with an explosive-filled projectile and having an unpacked weight of 100 pounds or less each. (b) Incendiary grenades and grenade fuses. (c) Detonators. (d) Detonating cord. (e) Supplementary charges. (f) Bulk explosives.</p>
4	LOW SENSITIVITY	<p>Category IV (a) Ammunition with non-explosive projectiles and having an unpacked weight of 100 pounds or less each. (b) Fuses, except those in Category III. (c) Grenades, illumination, smoke and practice, and CS/CN (tear-producing). (d) Incendiary destroyers. (e) Riot control agents in packages of 100 pounds or less.</p>

Source: USDoD (1989, pp. 30–37)

This accounting system is designed to ensure that Category I and II weapons listed under Code 1 are subject to enhanced security at all times. These measures include specific regulations on physical security, such as guard levels at storage facilities, modes of perimeter security, and communications equipment to alert authorities to a loss or theft of munitions (USDoD, 2000, pp. 24–25).

It is worth noting that the USDoD ranks small arms ammunition as Code 4 (low sensitivity), despite the often-ready availability of arms capable of firing military calibres. Given the potential destabilizing impact of leakages of most types of ammunition, it is probably safe to conclude that security measures should be as comprehensive as possible for all categories.

However, it is also important to note that, while the codes listed in Table 5.2 prioritize protective measures to prevent loss or theft, they do not allocate differing accounting standards. The US stockpile management and security system requires comprehensive accounting of *all* stocks—regardless of assigned codes—if it is to function adequately.

The importance of accounting in sustaining military efficiency

Ammunition is an expensive commodity and one that, due to lengthy production runs and national security commitments, needs to be procured in advance so as to be available on demand. In effect, it is part of a ‘national insurance’ policy. Accurate physical and financial accounting enable security forces to better forecast the demand for ammunition and also the costs of its procurement, maintenance, and disposal.

Effective accounting also brings operational benefits to security forces. Stocks that are accurately classified for reliability help ensure that serving personnel are issued with the best stocks of ammunition, thereby contributing to user confidence.

Cost saving and financial management of stocks

Accurate financial accounting, as part of broader accounting procedures, can help states make financial savings and, at the same time, deter the unnecessary accumulation of surplus stocks. For instance, states that are able to accurately estimate the costs of storing surplus stocks may find that ammunition disposal is a cheaper option in the medium to long term (Wilkinson, 2006, p. 237).

Further savings may also be made with regard to maximizing the use of existing stocks. One notable example is the use of surplus ammunition for training purposes, where the performance requirements are less stringent than for operational ammunition.

In 2001 a US Government Accountability Office (USGAO) report indicated that the US Army had purchased ten types of ammunition, despite the fact that over two million⁴ rounds of equivalent calibre ammunition were listed in the army's records as 'being of sufficient quality (either new or in like-new condition) for training purposes' (USGAO, 2001, pp. 14–15). This estimate was made feasible by comprehensive accounting procedures.

Ensuring reliability for the end-users of ammunition

States that employ effective accounting procedures alongside physical and chemical inspection regimes minimize the risk of issuing unstable or inoperable ammunition to security force personnel. Conversely, states that have ineffective or non-existent accounting procedures risk criticism from their forces for quality failings, which can also lead to a potential loss of morale.

Accounting procedures can help minimize the risks associated with ammunition malfunctions in two ways. First, systematic inventorying, which includes physical and chemical inspection reports, can prevent unstable ammunition from being issued to serving forces. Second, records of lot numbers of ammunition issued to forces, combined with systematic ammunition malfunction reporting,⁵ enable the tracing and inspection of suspect lots of ammunition.

Progress to date

Accounting procedures are inadequate, or non-existent, in many states. As a result, national security forces remain unable to document the ammunition within their stockpiles. The accumulation of surplus stock (CHAPTER 10) often proceeds unnoticed and arms and ammunition diversion escapes detection (CHAPTER 15).

Despite growing international attention to the issue of stockpile security, very few states have requested external assistance with the management of national stockpiles—including in the area of accounting.

Paradoxically, where accounting procedures remain ineffective, the vast majority of problematic stockpiles go undetected and many states fail to realize that they have a problem. Accounting failures impair diagnosis of loss, theft, or dangerous accumulations of surplus stock and, in the final analysis,

dissuade states from taking measures to control national stockpiles.

Because it comprises the basis for sound stockpile management, effective accounting is a priority for all national stockpiles. National stock audits are a critical first step in improving stockpile management, because they provide a baseline from which to assess whether stocks are unsafe, in surplus, or subject to diversion.

Conclusion

Accounting is a fundamental component of stockpile management and security. It can assist greatly in identifying stockpile losses or illicitly diverted stocks, as well as facilitating the management of shelf life expired and unstable ammunition. Whether as a security- or safety-enhancing strategy, effective accounting is a priority for all states.

Ideally, accounting mechanisms should comprise comprehensive networked systems that link information on types and quantities of ammunition stocks, the risks they pose to storage and transport, and information on the transfer and relocation of stocks.

The record-keeping component of accounting is, however, only effective when used in conjunction with a comprehensive set of reporting procedures, including the technical inspection of ammunition stocks and physical inventory audits.

Accounting is the first step in assessing whether the management of national stockpiles is secure or not. In many states, this baseline does not exist, leading to unchecked accumulation of surpluses, unstable stocks, and continued diversion from national stockpiles. ❏

Notes

- 1 Technical monitoring is known as surveillance and is covered elsewhere in this volume (CHAPTER 6).
- 2 For a discussion of accounting practices in the context of disarmament and weapons collection programmes, see SEESAC (2006).
- 3 Shelf life refers to the length of time an item of ammunition may be stored before its performance degrades. Shelf life is not a sufficient indicator of the stability of ammunition and explosives, and the latter can only be established by a comprehensive ammunition
- 4 These items, totalling 2,203,745 in number, were of mixed calibre, and included 7.62 mm, .30, .45, and .50 calibre cartridges for small arms and light weapons; 60 mm mortar rounds;

105 mm artillery rounds; 155 mm propellant charges; M228 hand grenades; and M18 red smoke grenades. This is based on USGAO (2001, p. 15) analysis of stockpile data provided by the Defense Ammunition Centre and purchases provided by Operations Support Command.

- 5 For an example of ammunition-malfunction-reporting procedures in the US Army, see USDoD (2001).

Further reading

- SEESAC (South Eastern and Eastern Europe Clearinghouse for the Control of Small Arms and Light Weapons). 2006. *RMDS/G 05.50: Ammunition and Explosives Stockpile Management*, 4th edn. Belgrade: SEESAC. March. <<http://www.seesac.org/resources/0550e.pdf>>
- USDoD (United States Department of Defense). 1989. *Single Manager for Conventional Ammunition (Implementing Joint Conventional Ammunition Policies and Procedures)*. DoD 5160.65-M. 'Chapter 12: Security.' Washington, DC: Department of Defense, Assistant Secretary of Defense (Production and Logistics). April.
- Wilkinson, Adrian. 2006. 'Stockpile Management of Ammunition.' In Stéphanie Pézard and Holger Anders, eds. *Targeting Ammunition: A Primer*. Geneva: Small Arms Survey, pp. 228–59.

Bibliography

- OSCE (Organization for Security and Co-operation in Europe). 2003a. *Handbook of Best Practices on Small Arms and Light Weapons: Best Practice Guide on National Procedures for Stockpile Management and Security*. FSC.GAL/14/03/Rev.2. Vienna: OSCE. 19 September.
- . 2003b. *OSCE Document on Stockpiles of Conventional Ammunition*. FSC.DOC/1/03. Adopted at the 407th Plenary Meeting of the OSCE Forum for Security Co-operation. Vienna: OSCE. 19 November.
- SEESAC (South Eastern and Eastern Europe Clearinghouse for the Control of Small Arms and Light Weapons). 2006a. *RMDS/G 05.50: Ammunition and Explosives Stockpile Management*, 4th edn. Belgrade: SEESAC. March. <<http://www.seesac.org/resources/0550e.pdf>>
- . 2006b. *RMDS/G 04.50: SALW Accounting*, 4th ed. Belgrade: SEESAC. July.
- USDoD (United States Department of Defense). 1989. *Single Manager for Conventional Ammunition (Implementing Joint Conventional Ammunition Policies and Procedures)*. DoD 5160.65-M. 'Chapter 12: Security.' Washington, DC: Department of Defense, Assistant Secretary of Defense (Production and Logistics). April.
- . 2000. *Physical Security of Sensitive Arms, Ammunition, and Explosives*. DoD 5100.76-M. Washington, DC: Assistant Secretary of Defense for Command, Control, Communications and Intelligence. 12 August.
- . 2001. *Malfunctions Involving Ammunition and Explosives*. RCS CSGLD–1961(MI). Washington, DC: Department of Defense, Headquarters, Department of the Army. 23 April.
- . 2002. *Marine Corps Ammunition Management and Explosives Safety Policy Manual*. MCO P8020.10A. 'Chapter 4: Security and Accountability.' Washington, DC: Department of Defense, Department of the Navy, Headquarters United States Marine Corps. April.

- USGAO (United States General Accounting Office). 2001. *Defense Inventory: Steps the Army Can Take to Improve the Management and Oversight of Excess Ammunition*. Report to the Chairman, Subcommittee on Readiness and Management Support, Committee on Armed Services, US Senate. Washington, DC: USGAO. April.
- Wilkinson, Adrian. 2006. 'Stockpile Management of Ammunition.' In Stéphanie Pézard and Holger Anders, eds. *Targeting Ammunition: A Primer*. Geneva: Small Arms Survey, pp. 228–59.