INTERNATIONAL AMMUNITION TECHNICAL GUIDELINES

IATG 03.10

Third edition
March 2021

Inventory management

UN SaferGuard
Securing ammunition, protecting lives

IATG 03.10:2021[E]

© UNODA 2021

Warning

The International Ammunition Technical Guidelines (IATG) are subject to regular review and revision. This document is current with effect from the date shown on the cover page. To verify its status, users should consult www.un.org/disarmament/ammunition

Copyright notice

The International Ammunition Technical Guidelines (IATG) are copyright-protected by the United Nations. Neither this document nor any extract from it may be reproduced, stored or transmitted in any form, or by any means, for any purpose without prior written permission from the United Nations Office for Disarmament Affairs (UNODA), acting on behalf of the United Nations.

This document is not to be sold.

United Nations Office for Disarmament Affairs (UNODA)
United Nations Headquarters, New York, NY 10017, USA

conventionalarms-unoda@un.org

© UNODA 2021 – All rights reserved

Contents

Foreword

Ageing, unstable and excess conventional ammunition stockpiles pose the dual risks of **accidental explosions at munition sites** and **diversion to illicit markets**.

The humanitarian impact of ammunition-storage-area explosions, particularly in populated areas, has resulted in death, injury, environmental damage, displacement and disruption of livelihoods in over 100 countries. Accidental ammunition warehouse detonations count among the heaviest explosions ever recorded.

Diversion from ammunition stockpiles has fuelled armed conflict, terrorism, organized crime and violence, and contributes to the manufacture of improvised explosive devices. Much of the ammunition circulating among armed non-State actors has been illicitly diverted from government forces.[1] In recognition of these dual threats of explosion and diversion, the General Assembly requested the United Nations to develop **guidelines for adequate ammunition management**.[2] Finalized in 2011, the International Ammunition Technical Guidelines (IATG) provide voluntary, practical, modular guidance to support national authorities (and other stakeholders) in safely and securely managing conventional ammunition stockpiles. The UN SaferGuard Programme was simultaneously established as the corresponding knowledge-management platform to oversee and disseminate the IATG.

The IATG also ensure that the United Nations entities consistently deliver high-quality advice and support – from mine action to counter-terrorism, from child protection to disarmament, from crime reduction to development.

The IATG consist of 12 volumes that provide practical guidance for 'through-life management' approach to ammunition management. The IATG can be applied at the guidelines' **basic, intermediate, or advanced levels**, making the IATG relevant for all situations by taking into account the diversity in capacities and resources available. Interested States and other stakeholders can **utilize the IATG for the development of national standards and standing operating procedures**.

The IATG are reviewed and updated at a minimum every five years, to reflect evolving ammunition stockpile-management norms and practices, and to incorporate changes due to changing international regulations and requirements. The review is undertaken by the UN SaferGuard Technical Review Board composed of national technical experts with the support of a corresponding Strategic Coordination Group comprised of expert organizations applying the IATG in practice.

The latest version of each IATG module can be found at www.un.org/disarmament/ammunition.

[1] S/2008/258.

[2] See also the urgent need to address poorly-maintained stockpiles as formulated by the United Nations Secretary-General in his Agenda for Disarmament, *Securing Our Common Future* (2018).

Introduction

Ammunition is an expensive commodity which could be regarded as an ‘insurance’ policy for the nation. It is hoped that it will never be needed, but long production lead times and national security commitments mean that it must be procured in advance in order that it is available on demand. This all comes at a cost which means that the inventory management systems should not only be capable of accounting for ammunition in great detail to support explosive safety but should also be designed to ensure that best ‘value for money’ is obtained from the ammunition.

Ammunition and explosives may deteriorate more rapidly or become damaged unless they are correctly stored, handled and transported, with the resultant effect that they may fail to function as designed and may become dangerous in storage, handling, transport and use. An accurate assessment of a munition’s life is of paramount importance in terms of safety, performance and cost.

Effective inventory management is an important component in a national authority's ‘Duty of Care’ to ensure that only ammunition that is serviceable and safe to use is issued to security agencies for both training and operational use. There is also a ‘Duty of Care’ to protect the civilian population in the local areas around explosive storage areas with appropriate quantity distances based on accurate net explosives weight of stocks.

The ability to rapidly detect inadvertent inaccuracy in accounting, loss of, theft from or diversion from the national stockpile is also a key control measure of effective stockpile management. Ineffective stock accounting systems significantly increase the risk of proliferation.

Inventory management

1 Scope

This IATG module introduces the concept of inventory management and explains the processes involved that will contribute to an overall safe, secure, effective and efficient conventional ammunition management system.

2 Normative references

A list of normative references is given in Annex A. These documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

A further list of informative references is given in Annex B in the form of a bibliography, which lists documents that contain additional information related to the contents of this IATG module.

3 Terms and definitions

For the purposes of this module the following terms and definitions, as well as the more comprehensive list given in IATG 01.40 *Glossary of terms, definitions and abbreviations,* shall apply.

The term ‘accounting’ refers to *information management systems and associated operating procedures that are designed to record, numerically monitor, verify, issue and receive ammunition in organisations and stockpiles*.

The term ‘batch’ refers to *a discrete quantity of ammunition, which is assembled from two, or more lotted components (one of which will be the Primary Governing Component), is as homogeneous as possible and under similar conditions may be expected to give uniform performance*. *Within the batch a number of sub-batches may be found.*

The term ‘batch key identity’ refers to *a term used to identify a particular batch of ammunition*.

The term ‘inventory management’ refers to *the systems and processes that identify stockpile requirements, the condition of the stockpile, provide replenishment techniques and report actual and projected inventory status*.

The term ‘lot’ refers to *a predetermined quantity of ammunition or components which is as homogeneous as possible and under similar conditions may be expected to give uniform performance*. *A lot would normally be manufactured from the same raw materials, using the same production technique and in the same production run.*

The term ‘munitions life assessment’ refers to *a systems approach to optimising the useful life of ammunition*.

The term ‘through life management’ refers to *an integrated approach to the process, planning and costing activities across the whole service life of a specific ammunition type.*

In all modules of the International Ammunition Technical Guidelines, the words 'shall', 'should', 'may' and 'can' are used to express provisions in accordance with their usage in ISO standards.

a) **'shall' indicates a requirement**: It is used to indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted.

b) **'should' indicates a recommendation**: It is used to indicate that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required, or that (in the negative form, 'should not') a certain possibility or course of action is deprecated but not prohibited.

c) **'may' indicates permission**: It is used to indicate a course of action permissible within the limits of the document.

d) **'can' indicates possibility and capability**: It is used for statements of possibility and capability, whether material, physical or casual.

4 Aim of an inventory management system

The aim of an inventory management system is to ensure:

a) the safety of personnel during the use, storage, handling, transportation or disposal of conventional ammunition;

b) the efficient use of the conventional ammunition stockpile, which is an expensive national asset;

c) the timely and reliable detection of losses or diversions; and

d) the controlled issue and use of specific or generic conventional ammunition.

5 Inventory management functions (LEVEL 2)

An effective inventory management system should have processes and procedures that cover the following activities:

a) forecast ammunition stockpile levels and future procurement and replenishment requirements;[3]

b) record and numerically monitor stockpile levels by ammunition type, lot number and/or batch number and by exact location (ammunition accounting);

c) monitor the amount of physical storage space available for the safe storage of ammunition;

d) monitor the condition of the ammunition stockpile by each ammunition type, lot number and/or batch number (ammunition condition);[4] [5]

e) ammunition procurement and replenishment;

f) allow ammunition turnover, meaning older and ex-operational stock can be used at training before shelf life expiry or deterioration due to environmental factors make it unsuitable or unsafe for use;

g) establish and record the financial costs of the ammunition stockpile and its maintenance;

h) enable calculation of net explosive quantities to ensure adherence to explosive license limits and associated quantity distances; and

[3] See IATG 01.30 *Policy development and advice.*

[4] This should be done using a system of surveillance, physical inspection, chemical analysis and in-service proof. See IATG 07.10 *Surveillance and proof* for further details.

[5] An explanation of lotting and batching systems is contained within IATG 03.20 *Lotting and batching*.

i) ensure that compatibility group mixing rules are being followed.

6 Through life management (LEVELS 2 and 3)

6.1 Introduction

Ammunition, due to its inherent hazards, high cost, battle winning capability and technical complexity, has to be managed efficiently and effectively A system of Through Life Management (TLM) should form part of the inventory management process as it enhances explosive safety and prolongs the useful life of the ammunition, hence delivering the optimum return on significant financial investment. It is a philosophy that brings together the behaviour, processes, functional roles and capability enabling lines as well as technical expertise that delivers a safe, secure, effective and efficient methodology for the stockpile management of conventional ammunition.

6.2 Munitions life assessments (LEVEL 2 and 3)

An essential component of TLM is Munitions Life Assessment (MLA), which is a systems approach to optimising the useful life of ammunition. MLA requires an appreciation of how ammunition ages and what environmental factors (due to storage conditions) will influence the ageing process. This is covered in detail in IATG 07.20 *Surveillance and proof.*

TLM not only improves explosive safety but can also deliver substantial cost savings, which are normally accrued towards the end of the useful life of ammunition. This is because sufficient technical data is then available to allow for safe extension of in-service life, thereby delaying the date on which replacement ammunition should be procured. Yet in order to do this, a degree of investment in effective technical inspection capability and inventory management systems is necessary in the early stages.

If a stockpile management organisation can confidently know the actual conditions that ammunition items have experienced throughout their lives, and understand the way that they degrade under such conditions, then the in-service life could be extended, if appropriate, for a particular ammunition item without compromising safety. Even decisions taken about storage conditions during short term operational deployment of ammunition (i.e. protecting the ammunition from extreme environments in terms of heat and cold) can have a major impact on prolonging ammunition in-service life.

6.2.1. MLA requirements and techniques

MLA consists of a range of knowledge requirements and techniques which may be used throughout the life cycle of the ammunition to maximise its useful life. These include:

a) effective and efficient data capture and analysis systems for ammunition technical data;

b) effective protection of ammunition from extreme climatic conditions of heat, cold and humidity;

c) the use of effective surveillance and in-service proof system, as detailed in IATG 07.20 Surveillance and In-Service Proof; and

d) a technical knowledge of how ammunition ages and may therefore fail.

6.2.2. Requirements for MLA (LEVEL 2)

For MLA to provide the most benefit there are the following requirements:

a) ammunition should not be disposed of with residual life available when there is a requirement to maintain a planned operational capability (this requirement should not be used as justification for the maintenance of surplus stocks);

b) replacement of ammunition should be planned so its arrival at the ASA coincides with when the life of existing ammunition has been fully consumed (ensuring that the appropriate safety margins are considered); and

c) excess and unused stocks that have been operationally deployed should be returned to depot storage (after appropriate technical inspection) rather than procuring new stocks.

6.2.3. Benefits of MLA

Although the use of MLA may not result in immediate financial benefit in the terms of life-cycle costs for all the ammunition currently within States' current stockpiles, it will provide other equally important benefits:

a) increased safety in storage, handling, transportation and use through a better understanding of failure modes;

b) consistent performance of ammunition during operations;

c) increased reliability of ammunition during operations;

d) a reduction in logistic and administrative requirements through improved asset tracking;

e) an improvement in the technical surveillance system by using environmental data to better target surveillance requirements;

f) more accurate life-planning of ammunition; and

g) an improvement in behaviour in the care of ammunition and the development of an 'ethos of explosive safety' at all levels.

For legacy ammunition already in an ammunition stockpile MLA should be used to initially determine the current safety of that ammunition if it is not accurately known. A subsequent decision should then be taken to either: 1) specify an in-service life and continue MLA; or 2) to destroy or demilitarize the ammunition. In many cases destruction or demilitarisation may be the only option as it may not even be cost effective to subject ammunition to MLA, even if such a technical capability already exists within an ammunition stockpile management organisation.

6.2.4. Ammunition management policy statements (AMPS) (LEVEL 2)

One means of ensuring that 'value for money' is obtained, as well as supporting safety, is the development of an Ammunition Management Policy Statement (AMPS)[6] for each specific type of ammunition. AMPS may be used to define a policy for the management of an item of ammunition or explosive throughout its service life and should list support information to assist staff with the maintenance and final disposal of the ammunition or explosive. This forms part of the inventory management process.

The contents of an AMPS are at Annex C.

[6] These are sometimes also known as Through Life Management Plans (TLMP). The term AMPS is used in the IATG as it makes it clear that it specifically refers to ammunition, as TLMP may exists for other commodities.

6.3 Improvement of in-service life for ammunition (LEVEL 3)

6.3.1. Benefits

MLA will assist in the identification of options to improve the in-service life of ammunition. Ideally, these measures should be taken prior to the introduction of the particular type of ammunition into service, but in many cases, there are already large stockpiles of ammunition for which life improvement measures may need to be taken.

Life improvement measures[7] should be designed to either preserve or conserve the life of the ammunition whilst it is in depot storage or is operationally deployed. The benefits of life improvement measures include:

a) the life of ammunition can be extended beyond that which would be possible without life improvement measures;

b) if life improvement measures are planned in advance of the introduction into service of an ammunition type then the service life increases may be significant;

c) the introduction of life improvement measures, even at the mid-life stage, for ammunition already in service can still increase service life;

d) the introduction of appropriate life improvement measures may reduce the overall life cycle costs of the ammunition (see Clause 20.1); and

e) the introduction of appropriate life improvement measures will lead to improved confidence in predicting the whole life of the ammunition.

6.3.2. Options

Life improvement measure options may be applied individually or as part of an overall policy designed to reduce the aging effects of the environment on particular ammunition types. These measures are shown in Table 1.

Generic In-Service Life Improvement Measure	Specific In-Service Life Improvement Measure	Explanation
Controlled Storage	▪ Use high quality Explosive Storehouses (ESH) with effective temperature and humidity control.	▪ Explosives degrade when there are conditions of high temperature and humidity. Controlled storage conditions can defer the onset of, and control the rate of, degradation.
	▪ Use a dual-inventory process, whereby a small proportion of a particular lot or batch of ammunition is used for training or operations, with the main stock remaining in controlled storage conditions.	
	▪ Use high quality ammunition packaging.	
Recording	▪ Temperature and humidity records of an ESH are maintained (ideally by use of a data logger).	▪ To be most effective MLA requires complete visibility of the environmental conditions a munition has been subjected to.
	▪ Exposure to environmental conditions outside controlled storage is recorded. (meteorological conditions and period of exposure).	

[7] Sometimes known as 'amelioration'.

Generic In-Service Life Improvement Measure	Specific In-Service Life Improvement Measure	Explanation
	▪ Exposure to operational transport and use conditions (i.e. time spent by a missile vibrating on an armoured vehicle).	
Data Logging	▪ Use of an electronic data logger to record temperature and humidity conditions in each ESH.	▪ If environmental conditions can be accurately recorded, then the percentage of in-service life consumed can be estimated.
Ageing Algorithm	▪ Knowledge of actual conditions when compared against technical surveillance and in-service proof results may allow for the development of ageing algorithms for specific ammunition types.	▪ This requires a quantifiable understanding of the cause-effect link between environment and life-limiting failure.

Table 1: Ammunition in-service life improvement measures

The effectiveness of life improvement measures may not become immediately quantifiable, and the cost benefit will depend to a degree on the type and quantity of ammunition subjected to such improvements. Yet storage under controlled conditions of those ammunition types most susceptible to environmental factors (i.e. propellant, rocket motors and pyrotechnics) should be an effective option.

One of the aims of life improvement measures should be to build models of the ageing characteristics of the explosives in service use, which can be used in future MLA processes. Immediate benefits may not be easily identifiable, but they should become more quantifiable over the longer term. As the effective service life of much ammunition is over 20 years the use of MLA should be considered as a long-term investment.

7 Types of ammunition stockpiles[8] (LEVEL 1)

An effective inventory management system should ensure that the type of ammunition stockpile is clearly defined and that detailed technical information on the quantity, location and condition of the ammunition itself (by specific type) is readily available.

There may be a range of separate ammunition and explosive stockpiles within a country that are under the control of different organisations (such as the police, military (both active and reserve), border guards, ammunition production company holdings etc). Each of these organisational stockpiles should have one or more of the following generic parts:

Type	Comment
Operational ammunition and explosives	▪ The ammunition and explosives necessary to support the routine operations of military, police and other security agencies over an agreed period.
War reserve ammunition and explosives	▪ The ammunition and explosives necessary to support the operations of military, police and other security agencies during external conflict or general war over an agreed period. ▪ 30 days at intensive expenditure rates is often used as the time period.

[8] Also contained within IATG 01.30 *Policy development and advice* and repeated here for convenience.

Type	Comment
Training ammunition and explosives	▪ The ammunition and explosives necessary to support the routine training of military, police and other security agencies. This will usually be an agreed percentage of the war reserve holdings. ▪ 15% would not be unreasonable, dependent on the training activities and frequency.
Experimental ammunition and explosives	▪ This type of ammunition is usually only held by those nations with a research, development and production capability. ▪ These holdings will be minimal but must be included for intellectual accuracy. ▪ They may also pose specific risks which would require their separate storage and accounting
Production ammunition	▪ This type of ammunition is usually only held by those nations with a production capability. ▪ The ammunition and explosives that have been produced and are awaiting sale under the control of the manufacturer. These may be available to the military during general war but would not form part of the war reserve as their availability cannot be guaranteed.
Ammunition and explosives awaiting disposal	▪ The ammunition and explosives that have been identified as unserviceable, unstable or surplus to requirements.

Table 2: Generic types of ammunition stockpiles

The total of all these generic parts should be referred to as the 'national stockpile'. The management of stocks of small arms ammunition in the possession of civilians or retailers should be determined in accordance with MSAIC 03.30 *National controls over the access of civilians to SALW* and not in accordance with this module.

8 Ammunition management system requirements (LEVEL 2)

An ammunition management system should be dependent on the organisational structure, administrative requirements and operational responsibilities of the security forces within a State. Notwithstanding the rights of States to maintain their own organisational structures, a clear chain of command and responsibility shall exist. The ammunition stockpile management system should be made up of the organisations shown in Table 3.

Organisations	Remarks
Ammunition management department	▪ Usually at Ministry of Defence/Interior or Service (Army, Navy, Air Force, Police etc.) level.
Ammunition storage units	▪ Subordinate to the ammunition management organisation. ▪ Usually the major ammunition storage depots.
Ammunition technical inspection units	▪ Subordinate to the ammunition management organisation and co-located with the major ammunition storage depots.
Ammunition training unit	▪ Subordinate to the ammunition management organisation. ▪ Should be co-located with a major ammunition depot.
Ammunition inspectorate	▪ Subordinate to, and reports directly to, the ammunition management organisation. ▪ Independent of other ammunition units. ▪ Consists of ammunition technical staff to ensure the safety and condition of ammunition within user units.
User units	▪ User units fall under the operational chain of command.

Table 3: Ammunition management system components

9 Ammunition management organisation responsibilities (LEVEL 2)

The role of the conventional ammunition management organisation[9] shall include the responsibility to:

a) develop a policy for effective and efficient ammunition storage and accounting;

b) develop effective ammunition storage and accounting units (usually major ammunition depots) and maintain their operational capability;

c) develop a policy for the technical inspection of ammunition when in-service;

d) develop effective ammunition technical inspection units and maintain their operational capability;

e) develop an effective ammunition training unit and maintain its operational capability;

f) develop an effective ammunition inspectorate and maintain its operational capability;

g) co-ordinate with manufacturers in the allocation and promulgation of lot and batch numbers for specific ammunition types (see IATG 03.20 *Lotting and batching*);

h) develop an ammunition descriptive asset code (ADAC) type system, or similar, then allocate and promulgate unique ADAC codes (see Clause 17);

i) develop and maintain ammunition management policy statements (AMPS) or their equivalent;

j) maintain an overview of the frequency and accuracy of ammunition stock checks;

k) develop and implement a system of explosive limits licences (ELL) for ammunition storage and processing facilities (see IATG 02.30 *Licensing of explosive storage areas (ESA));*

l) develop and promulgate a system for the issue and receipt of ammunition between manufacturers, stock holding units and user units;

m) develop and maintain an internal capability to undertake external audits of ammunition accounting and storage units (stockpile safety and accuracy of ammunition accounts);

n) maintain an overview of the usage rates of the conventional ammunition stockpile;

o) maintain an overview of the technical condition of the conventional ammunition stockpile and ensure that appropriate inspection, repair, maintenance or modification processes take place to ensure the safety of the ammunition stockpile;

p) develop and maintain a system for the technical surveillance and in-service proof of ammunition (see IATG 07.10 *Surveillance and proof*);

q) procure new and/or replacement ammunition, when appropriate, to ensure that operational needs can be met (see Clause 20.1); and

r) maintain an overview of technical developments in the wider field of explosive engineering and conventional ammunition.

10 Ammunition storage unit responsibilities (LEVEL 1)

The ammunition storage units (usually the major ammunition depots), which should be subordinate to the ammunition management organisation, shall have the responsibility to:

[9] Which may also act as the National Technical Authority.

a) effectively implement the ammunition accounting system;

b) ensure the security of ammunition stocks;

c) accurately account for ammunition by specific type, quantity lot and/or batch number and exact location within the ammunition stockpile at all times. Records should be maintained for the whole in-service life of the ammunition and 10 years beyond *

d) develop and maintain a system and capability to stock check ammunition by specific type, lot and/or batch number.[10] Records should be maintained for at least ten years;

e) accurately implement the system for the issue and receipt of ammunition between manufacturers, stock holding units and user units. Records should be kept for the whole in service life of the ammunition and 10 years beyond.

f) liaise with the ammunition technical inspection units to ensure the efficiency of in-service ammunition inspection, repair, maintenance and modification processes; and

g) maintain accurate records on the technical condition of ammunition in storage for the whole in service life of the ammunition and 10 years beyond.

11 Ammunition technical inspection unit responsibilities (LEVEL 2)

The ammunition technical inspection units (usually co-located with the major ammunition storage and accounting depots), which should be subordinate to the ammunition management organisation, shall have the responsibility to:

a) safely and effectively inspect (physically), repair, repackage, maintain or modify ammunition when instructed by the ammunition management organisation. (Records should be kept for the whole in service life of the ammunition and 10 years beyond.

b) safely and effectively undertake chemical analysis of explosives and propellants to assure that the ballistic performance of the ammunition is within operational or training limits, and to ensure its chemical stability in storage. (This task may alternatively be undertaken by an appropriate explosives laboratory.);

c) conduct surveillance and in-service proof of ammunition as instructed by the ammunition management organisation (see IATG 07.20 *Surveillance and proof*); and

d) liaise with the ammunition storage units to ensure efficient stock transfer processes.

12 Ammunition training unit responsibilities (LEVEL 2)

The role of the ammunition training unit, which may be subordinate to the ammunition management organisation, should include the responsibility to:

a) develop and provide standardised initial, upgrading and refresher ammunition technical training to ammunition technical staff;

b) develop and provide basic, standardised, ammunition safety in storage training for non-ammunition units; and

c) maintain an overview of technical developments in the wider field of explosive engineering and conventional ammunition.

[10] The frequency of stock checks should be determined by the ammunition management organisation and should not be less than three-monthly. For large stockpiles a continuous 'rolling' stock check may be necessary.

The ammunition training unit may also have the responsibility to:

d) develop and provide standardised Explosive Ordnance Disposal (EOD) training; and

e) research technical developments in the wider field of explosive engineering and conventional ammunition and report, as appropriate, to the ammunition management organisation.

13 Ammunition inspectorate responsibilities (LEVEL 3)

An ammunition inspectorate is normally an independent unit consisting of ammunition technical staff that reports directly to the ammunition management organisation. It may be under the command of a formation (i.e. Army, Corps, Division or Brigade) for operational and administrative purposes, but it shall retain the right of direct reporting to the ammunition management organisation where areas of explosive safety are concerned.

An ammunition inspectorate should have the responsibility to:

a) conduct regular (annual) unit ammunition inspections to ensure the safety in storage at unit level and to assess the technical condition of the ammunition in unit storage; and

b) advise units and formation headquarters on ammunition safety and technical issues.

An ammunition inspectorate may also have the responsibility to:

a) investigate ammunition incidents and accidents (see IATG 11.20 *Ammunition accidents: reporting and investigation*);

b) provide 'expert witness' evidence to judicial enquiries;

c) provide Explosive Ordnance Disposal (EOD) support;

d) provide support to technical intelligence units; and

e) research technical developments in the wider field of explosive engineering and conventional ammunition and inform the ammunition management organisation as appropriate.

14 Ammunition accounting

14.1 Ammunition accounting requirements (LEVELS 1 and 2)

Accurate records should be kept (by specific type, quantity, lot and/or batch number and exact location) for the following stages in the life of the ammunition:

a) on manufacture;

b) on initial testing;

c) during transportation and shipment;

d) on transfer to procurement agency;

e) on transfer to the ammunition management organisation;

f) in depot storage;

g) on transfer to user units;

h) during storage at user units;

i) in case of loss or theft;

j) when used;

k) when returned to ammunition depots;

l) when repaired or modified;

m) when subjected to surveillance or in-service proof;[11] and

n) when disposed of.

14.2 Accounting systems (LEVEL 1)

Either manual or IT-based ammunition accounting systems may be used. Although manual systems are labour intensive and time-consuming compared to IT-systems, and the transmission of information between higher formations and units is slow, they have proven capability and are simple to use when individuals are appropriately trained. Their effectiveness is determined by the administrative instructions for their use and the standing operating procedures used within the ammunition depot. For reasons of accounting accuracy, explosive safety and operational efficiency, parallel systems that can identify specific ammunition by either stockpile location or by lot/batch number are required. Regular reports on inventory levels and condition should be made by the ammunition accounting and storage units to the ammunition management organisation.[12]

Although IT-based ammunition accounts are more efficient and capable, they are expensive to develop, are usually specifically designed for a particular ammunition stockpile management organisation and are just as reliant as the manual systems on the accuracy of the data entered into them. They can be directly linked between the ammunition management organisation and the ammunition accounting and storage units, thereby reducing the requirement for reporting of stock levels as instant visibility is possible.

14.3 International accounting principles and standards (LEVEL 2)

Principles for ammunition accounting may be derived from Generally Accepted Accounting Principles.[13] Although these are a widely accepted set of rules, conventions, standards and procedures for primarily reporting and recording financial information, the requirements for recording transaction activity and stock levels are equally applicable to ammunition as to any other commodity or process. The following accounting principles should be followed for the accounting of ammunition:

a) **objectivity:** ammunition accounts should be based on objective evidence derived from physical stock checks, independent audits and effective operating procedures for transactions;

b) **materiality:** the significance of an accounting issue should be considered when it is reported (i.e. an ineffective component of an accounting method). An issue is considered significant when it would affect the decision of a reasonable individual;

c) **consistency:** the ammunition accounting unit shall use the same accounting principles and methods from year to year; and

d) **prudence**: when choosing between two options, the one should be picked that will be most likely to ensure that a discrepancy, loss or theft is detected.

---

[11] See IATG 07.10 *Surveillance and proof*.

[12] Reporting frequency will depend on expected usage rates, and the current condition of the stockpile. It is recommended that reports should be submitted monthly.

[13] GAAP are used by a range of countries. GAAP are being integrated into a range of new International Financial Reporting Standards (IFRS) and International Accounting Standards (IAS). IFRS and IAS are developed and promulgated by the International Accounting Standards Board (IASB) (www.iasb.org), an independent organisation.

14.4 Accuracy of ammunition accounts

No ammunition storage organisation is likely to be able to achieve 100% accuracy in its ammunition accounts. For example, if storage staff issue the right type of ammunition, but of the wrong lot or batch number, there is automatically a discrepancy until the error is identified and rectified during a regular stock check. In this example, the quantity of ammunition in storage would be the same and there has been no criminal intent, but the ammunition account would be inaccurate as 100% visibility of that particular lot or batch number has been lost.

14.5 Stack tally cards (LEVEL 1)

The use of stack tally cards is an effective measure that supports accurate ammunition accounting, assists in stocktaking and deters theft. Each stack of ammunition[14] should have a tally card(s) attached to it that records the following information for that particular stack:

a) grid locator reference;

b) Explosive Storehouse (ESH) number;

c) full description of ammunition (see Annex E);

d) Ammunition Descriptive Asset Codes (ADAC) number (or similar asset code system) (see Clause 17);

e) lot and/or batch number (a separate card should be used for each lot and/or batch number);

f) ammunition condition code (see Clause 18.1);

g) a record of transactions for that stack by quantity, lot/batch number and date; and

h) the issue or receipt voucher reference for each transaction.

i) A record of stock checks in red.

A specimen example of a stack tally card in use is at Table 4.

Ammunition Stack Tally Card							
							IATG Form 03.10
	ESH	3		**ADAC**	34638-27C		
	Ammunition Type	Shell 155mm HE L15		**Lot/Batch**	GD 0215 217		
	Condition Code	A2		**Remarks**	For Operational use only		
Date	**Issue/Receipt Voucher Number**	**Received**	**Issued**	**Balance**	**Signature**	**Name**	**Grid Locator Reference**
03/02/16	RV 16/0021	1,036	_____	1,036	Insert signature	Verity	B4,B5,B6, C5 to C11
07/04/16	**Stock check**	_____	_____	**1,036**	**Ditto**	**Booth**	**B4,B5,B6, C5 to C11**
09/05/16	IV 16/0154	_____	220	816	Ditto	Verity	B4,B5,B6, C5 to C9
15/06/16	RV 16/0102	96	_____	912	Ditto	Root	B4,B5,B6, C5 to C10
29/06/16	**Stock check**	_____	_____	**912**	**Ditto**	**Booth**	**B4,B5,B6, C5 to C10**

Table 4: Example stack tally card

[14] A stack is the amount of ammunition that is contained within a particular Grid Locator base within an explosive storehouse. This may range from a single ammunition box within a ground level UOS, to a block of many pallets stored vertically over a number of particular ground level UOS.

Stack tally cards should be placed in plastic envelopes or suitable substitutes to prevent deterioration of the forms and to protect them from moisture. When the form is completed, or the last lot or batch of that particular ammunition has been issued, then the stack tally card should be kept by the ammunition depot stocktaking department for 10 years after the ammunition has been issued. This allows future reconciliation of ammunition accounts should a discrepancy occur in the future during stocktaking or audit.

14.6 Stocktaking and audits (LEVEL 1)

Stocktaking is an essential process in supporting the accuracy of ammunition accounts by identifying discrepancies, loss or theft. It means that trained staff, who fully understand the way that ammunition and its packaging is marked, should physically count and record the ammunition in each storage location.

A fundamental principle of effective stocktaking is that staff shall not be provided with a copy of what the ammunition account shows for each storage location. It is only through the reconciliation between the ammunition account and the stocktaking record for each storage location that a proper stock check is conducted.

Stocktaking should take place at least every three months, but for large stockpiles of ammunition a continuous 'rolling' stock check may need to be implemented.

15 Stock location in explosive storehouses (LEVEL 2)

15.1 Units of space concept (see also IATG 06.20)

Ammunition stock location can be simplified if a Unit of Space (UOS) concept is adopted. It is generally assumed for planning purposes that the volume of most pallets or unit load containers equate to one cubic metre, with an average weight of 1 tonne. This approach simplifies ammunition storage planning, as the number of UOS within an explosive storehouse may be easily calculated by a simple volume measurement. A small amount of space can be deducted to allow for:

a) the maximum safe stacking height for the ammunition (usually 3 or 4 metres if palletised);

b) aisles wide enough for the type of mechanical handling equipment being used (at least 2m for mechanical handling equipment or 1.2m for hand pallet transporters);

c) a 500mm air gap from the front wall of the ESH to ammunition stacks; and

d) a 500mm air gap between the exterior walls of the ESH and the ammunition stacks.

The remaining floor space is then available for the first layer of pallets. As a UOS must be an integer, the fractions of metres are discounted (which has the benefit of increasing free air space within the ESH and hence improves air circulation). The floor area as an integer multiplied by the safe stacking height as an integer (1, 2, 3 or 4) then equates to the Units of Space, or standard pallets that may be physically stored within the ESH.

A similar approach can be used for un-palletised ammunition, but it is then essential that the exact dimensions of ammunition outer packaging are known.

Table 5 is an illustrative UOS calculation for an ESH.

Dimension	#	Remarks
ESH Width	6m	▪
ESH Length	8m	▪
ESH Height	3.7m	▪
ESH Volume	177.6m^3	▪

Dimension	#	Remarks
MHE Gangway	2m	▪ This reduces the available width.
Available ESH Width	3m	▪ ESH Width minus MHE Gangway and 2 x 0.5m air space at ends of ESH.
Available ESH Length	7m	▪ ESH Length minus 2 x 0.5m air space at ends of ESH.
Available ESH Height	3m	▪ ESH Height minus 100mm air space to floor and 500mm air space to roof. Rounded down to nearest metre for palletisation reasons. Block loose stack height would be 3.1m.
Maximum Theoretical UOS	**63**	▪ One row of 7UOS, three high, = 21 UOS. ▪ MHE Gangway of 2m. ▪ Two rows of 7 UOS, three high = 42 UOS.

Table 5: UOS calculation example

15.2 Grid locator

Ammunition storage within each ESH should be organised in such a way that it can be easily found, as this will improve the issue, receipt and auditing processes. A simple Grid Locator concept may be used as a method of identifying storage locations, which can then be recorded in the ammunition account and on the Stack Tally Cards (see Clause 14.5). A separate record of the location plan, in diagrammatic form, should be kept as a UOS summary as this will identify spare storage space.

Table 6 is an illustrative Grid Locator for the ESH example in Table 5.[15]

Ammunition Depot:				**Greentown**			
ESH		***21***		**Date:**		**23/11/09**	
Grid	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A							
B							
C							
D							
E							
F							
G							
H							
J							
K			X				
L							
M							

Table 6: Grid locator example

A further refinement then allocates the UOS in a single floor grid location by its position in the stack using (a), (b), (c) or (d). Therefore, the third UOS from the floor in grid square K3 would be referred to as K3(c).

[15] Note that the letter 'I' is not used. This avoids confusion with the number '1'.

The use of the UOS concept with a Grid Locator for each ESH will assist in:

a) reducing time taken to locate ammunition for issue, receipt or internal depot transfer;

b) improving the efficient use of available storage space;

c) maintaining the accuracy of the ammunition account; and

d) ensuring that the ESH is not bulk overloaded.

15.3 Planographs

A system similar to the grid system at Clause 15.2 is that of planographs, which also include details of the ammunition, stored within each grid locator. This is explained at Annex B to the *OSCE Handbook of Best Practices on Conventional Ammunition*.[16]

16 Storage space issues (LEVEL 2)

An explosive storehouse should be considered as 'full' when either:

a) all UOS contain ammunition stocks and the Net Explosive Quantity (NEQ) is within the Explosives Limit Licence (see IATG 02.20 *Quantity and separation distances*) for that particular ESH. This condition is known as 'bulked out'; or

b) there are spare UOS available, but the ESH has reached its explosive limit for Hazard Division 1.1, 1.2 or 1.3 ammunition. This condition is known as 'NEQ out'. In this case it may still be permissible to fill the remaining UOS with ammunition of Hazard Division 1.4S if storage space is at a premium.

If storage space permits, it is desirable that a UOS only contains the same specific type of ammunition with the same lot or batch number. Although this is not the most efficient use of storage space, it does make other ammunition management processes a lot easier (i.e. stocktaking, audit etc.), and reduces the risks of discrepancies in the ammunition account.

17 Ammunition descriptive asset codes (LEVEL 2)

There is a very wide range of ammunition types all of which are specific to one or more weapon systems. This means that when referring to the ammunition the exact type must be quoted (i.e. Shell 155mm High Explosive L15A1 or Charge Propelling 155mm L18A2).

The same specific type of ammunition is also often packaged differently dependent on the type of logistic distribution system that it is destined for on operational use (i.e. a Unit Load Container (ULC) contained both HE Shell (Fuzed) and Propelling Charges or a Pallet of HE Shell (Un-fuzed only)).

The level of descriptive detail necessary to ensure that the right specific type of ammunition is being delivered to the user, or that the ammunition depot has counted the right specific type of ammunition during a stock check, means that mistakes are easily made.

[16] *Handbook of Best Practices on Conventional Ammunition*, Annex B. Decision 6/08. OSCE. 2008;

One method of simplifying this process is by the use of a system of Ammunition Descriptive Asset Codes (ADAC),[17] which may be used in place of long descriptive text. An ADAC system uses a five- or seven-digit numerical code with an optional suffix letter, which is specific for each different type of ammunition and the way that it is packed. This code represents:

a) the user group of the ammunition concerned (i.e. infantry, artillery, tank etc);

b) the generic type of ammunition (i.e. Shell, 155mm);

c) the specific type of ammunition (i.e. Shell HE, 155mm); and

d) the mark or model number (i.e. Shell HE, 155mm, L15A1).

An example of such a system is at Table 7.

Figure	Numeral	Group	ADAC Type		
First	1	▪ Common Light Ammunition.	The Generic ADC	The Specific ADAC	The Packaged ADAC
	2	▪ Armoured Vehicle Ammunition.			
	3	▪ Gunnery and Artillery Ammunition.			
	4	▪ Aircraft, Air Delivered and Aviation Support Ammunition.			
	5	▪ Mines, Explosives, Clearance, EOD and Engineering Ammunition.			
	6	▪ Guided Weapons, Rockets, Torpedoes and Depth Charges.			
Second and Third	11 - 99	▪ The generic type of ammunition (i.e. Shell, 155mm).			
Fourth and Fifth	11 - 99	▪ The specific type of ammunition (i.e. Shell HE, 155mm).			
Sixth and Seventh	11 - 99	▪ The specific mark or model (i.e. Shell HE, 155mm, L15A1).			
Suffix Letter	A - Z	▪ The method of packaging (i.e. Palletised or Unit Load Container).			

Table 7: Example of ADAC type system

Table 8 illustrates an ADAC system for the range of 155mm Shell using the example ADAC system in Table 7:[18]

Ammunition Type	First Letter	Second and Third Letters	Fourth and Fifth Letters	Sixth and Seventh Letters	Suffix Letter
155mm Shell HE	3	46	38		
Generic ADAC is 34638					
155mm Shell HE L15A1	3	46	38	27	
Specific ADAC is 34638-27					
155mm Shell HE L15A1 (Palletised)	**3**	**46**	**38**	**27**	**C**
Packaged ADAC is 34638-27C					

Table 8: Example ADAC

[17] NATO also uses a 13-digit identification number for its ammunition stocks.

[18] The numbers used in the ADAC example are illustrative only, and do not represent the real ADAC used by any State using a similar system.

18 Condition classification of ammunition (LEVELS 2 and 3) [19]

All ammunition and explosives should be classified[20] as to their condition, which will require a surveillance and in-service proof system.[21] The ammunition condition is used to define the degree of serviceability of the ammunition and the degree of any constraints imposed on its use.

National authorities should ensure that the declared ammunition 'shelf life' is an indication of the performance capability of the ammunition and not necessarily just its safety or stability in storage; only physical inspection and ammunition surveillance can determine this.

National authorities should therefore develop a system that allows the condition of the ammunition to be clearly defined, as it is only in this way that safe storage conditions may be maintained, and subsequent disposal or destruction can be prioritised.

18.1 Ammunition condition groups

The following groupings and codes could be used as a means of classifying the condition of ammunition stocks:

Condition Type Code	Condition Sub-Type Code	Ammunition Status
A		▪ **Serviceable stocks available for use.**
	A1	▪ Available for issue.
	A2	▪ Available for issue, but subject to a minor constraint.
	A3	▪ Available for issue subject to national technical authority approval.
B		▪ **Stocks banned from use pending a technical investigation.**
	B1	▪ Banned for use, but cleared for routine storage and movement.
	B2	▪ Banned for issue and use, and not cleared for movement.
	B3	▪ Awaiting manufacturer's quality assurance reports.
	B4	▪ Shelf life expired.
C		▪ **Stocks unavailable for use pending technical inspection, repair, modification or test**
	C1	▪ Minor processing or repair only required.
	C2	▪ Major processing or repair required.
	C3	▪ Awaiting inspection only ex-unit.
	C4	▪ Manufacturers processing or repair awaited.
	C5	▪ Force regeneration processing required.
D		▪ **Stocks for disposal.**
	D1	▪ Surplus, but serviceable stocks.
	D2	▪ Unserviceable stocks.

Table 9: Ammunition condition classification groups

[19] Also see IATG 07.20 *Inspection of ammunition*.

[20] Best ammunition management practice further recommends that ammunition should also be classified by their Dangerous Goods Classification and UN Serial Number, Hazard Division, Compatibility Group and Hazard Classification Code. (See IATG 01.50 *UN Explosive hazard classification system and codes* for further details.)

[21] See IATG 07.10 *Surveillance and proof* for further details.

When ammunition is subject to inspection and surveillance[22], which is good stockpile management practice, it is inevitable that defects will be found. These defects shall determine which 'Condition Group' the ammunition is placed in, and categorised as:

Defect Type	Ammunition Status
Critical	▪ Defects affecting safety in storage, handling, transportation or use.
Major	▪ Defects that affect the performance of the ammunition and that require remedial action to be taken.
Minor	▪ Defects that do not affect the safety or performance of the ammunition but are of such a nature that the ammunition should not be issued prior to remedial action having been taken.
Insignificant	▪ Any defect that does not fall into any of these categories, but which could conceivably deteriorate into one of them if no remedial action is taken.
Technical	▪ Any defect that requires further technical investigation.

Table 10: Types of ammunition defect

Therefore, it is possible that ammunition classified as B4 (shelf life expired), is not an urgent priority for disposal as further technical investigation may well extend its shelf life, and hence it would be re-classified as A for a further period of time.

[22] The economical surveillance of ammunition and accurate assessment of the quality, within known confidence levels, is achieved by taking a relatively small, random sample from a large bulk quantity.

Annex A
(normative)
References

The following normative documents contain provisions, which, through reference in this text, constitute provisions of this part of the guideline. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of the guideline are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO maintain registers of currently valid ISO or EN:

a) *Handbook of Best Practices on Conventional Ammunition*, Annex B. Decision 6/08. OSCE. 2008;

b) International Accounting Standard 2 (IAS2): *Inventories*. IASB. 2005;

c) IATG 01.40 *Glossary of terms, definitions and abbreviations*. UNODA. 2020;

d) IATG 01.50 *UN Explosive hazard classification system and codes*. UNODA. 2020;

e) IATG 01.60 *Ammunition faults and performance failures*. UNODA. 2020;

f) IATG 01.70 *Bans and constraints*. UNODA. 2020;

g) IATG 02.20 *Quantity and separation distances*. UNODA. 2020;

h) IATG 03.20 *Lotting and batching*. UNODA. 2020;

i) IATG 07.20 *Inspection of ammunition*. UNODA. 2020;

j) IATG 07.10 *Surveillance and proof*. UNODA. 2020; and

k) Modular small-arms-control implementation compendium (MOSAIC). UN 2018..

The latest version/edition of these references should be used. The UN Office for Disarmament Affairs (UNODA) holds copies of all references[23] used in this guideline and can be found at: www.un.org/disarmament/un-saferguard/references. A register of the latest version/edition of the International Ammunition Technical Guidelines is maintained by UNODA, and can be read on the IATG website: www.un.org/disarmament/ammunition. National authorities, employers and other interested bodies and organisations should obtain copies before commencing conventional ammunition stockpile management programmes.

[23] Where copyright permits.

Annex B
(informative)
References

The following informative documents contain provisions, which should also be consulted to provide further background information to the contents of this guideline:

a) Joint Service Publication 762 *Through Life Munitions Management*. MOD. UK. 2005;

b) Modular small-arms-control implementation compendium (MOSAIC). UN 2018.; and

c) STANAG 4315 *The Scientific Basis for the Whole Life Assessment of Munitions*. NATO Standardization Organization (NSO).

The latest version/edition of these references should be used. The UN Office for Disarmament Affairs (UNODA) holds copies of all references[24] used in this guideline and can be found at: www.un.org/disarmament/un-saferguard/references. A register of the latest version/edition of the International Ammunition Technical Guidelines is maintained by UNODA, and can be read on the IATG website: www.un.org/disarmament/ammunition. National authorities, employers and other interested bodies and organisations should obtain copies before commencing conventional ammunition stockpile management programmes.

[24] Where copyright permits.

Annex C
(informative)
Ammunition management policy statements (AMPS)

AMPS are one means of determining and disseminating policy for the safe, effective and efficient management of an ammunition type throughout its service life. AMPS can contribute to ensuring that the ammunition is correctly and most cost efficiently looked after during its service life, including its final disposal.

This annex provides an example of the layout of an AMPS:

C.1. Ammunition configuration

The paragraph on ammunition configuration is to include details of the designation and manufacturer. Similar details are to be given for components such as fuzes and primers, even if they are the subject of separate policy statements.

C.2. General

C.2.1 General description

The ammunition is to be described briefly and approximate weights and dimensions are to be given.

C.2.2 Planned role and deployment

The planned role of the ammunition is to be explained with its deployment.

C.2.3 Associated equipments

Associated equipments are to be briefly described with, where appropriate, their use.

C.2.4 Deployment and use by other nations

Known or anticipated purchases of equipment by other nations, which may use the ammunition of the same design (rather than similar ammunition of the same calibre), are to be listed.

C.3. Planned life

C.3.1 In-service date

The In-Service Date (ISD) is to be given.

C.3.2 Design shelf life

The designer's estimate of the minimum shelf life (Design Shelf-Life) for the ammunition is to be given.

C.3.3 Assessed shelf life

The Assessed Shelf-Life as stated by the relevant national technical authority or Cardinal Point Specification (CPS) is to be given.

C.3.4 Shelf-life extensions

Shelf-Life Extensions are to be included as amendments when they occur.

C.3.5 Arrangements for turnover at training

Brief details of the policy for guiding ammunition turnover from operational and war reserve to training are to be given.

C.4. Surveillance

The in-service surveillance and proof strategy is to be stated as advised by the relevant national technical authority.

C.4.1 Service quality requirement

The Service Quality Requirement (SQR) is to be expressed as a percentage.

C.4.2 Functional limiting quality

The Functional Limiting Quality (FLQ) is to be expressed as a percentage.

C.4.3 Operational limiting quality

If determined, the Operational Limiting Quality (OLQ) is to be expressed as a percentage.

C.5. Ammunition maintenance and repair policy

C.5.1 Policy

The maintenance policy is to be stated.

C.5.2 Tools, equipment and materials

The tools, equipment and materials required for maintenance and repair are to be listed and an indication given of the planned deployment, sources of supply and equipment management policy. The information, if lengthy, may be included as an Annex to the AMPS.

C.6 Storage

C.6.1 Net explosive quantity

The total Net Explosive Quantity (NEQ) is to be given for each ammunition nature.

C.6.2 Hazard classification code

The Hazard Classification Code (HCC) is to be given for each ammunition nature.

C.6.3 Temperature limitations

The upper and lower ammunition temperature limits for storage and use and the climatic zones for which the ammunition is cleared are to be given.

C.6.4 Stacking limitations

Any stacking limitations are to be given.

C.6.5 Special storage requirements

Any special storage requirements or limitations to the storage of the ammunition in normal or field storage conditions are to be given.

C.7 Transportability

C.7.1 Special requirements and restrictions on movement

Any special requirements for, or restrictions on, the movement of the ammunition by road, rail, sea and air are to be detailed.

C.7.2 Shipping stowage category

The shipping stowage category of the ammunition is to be given with any restrictions.

C.7.3 Air dropping

The suitability of the ammunition for air dropping is to be given.

C.8 Disposal

C.8.1 Individual rounds and bulk

Alternative methods of disposal for both an ammunition item and bulk stock are to be stated and are to be cross-referenced to ammunition destruction technical procedures.

C.8.2 Demilitarization

Proposed methods for the disposal of bulk quantities under controlled conditions (demilitarization) are to be stated.

C.9 Technical publications

All reference publications are to be listed.

C.10 Packaging

C.10.1 Authorized service packs

The Authorized Service Packs are to be listed.

C.10.3 Expendable/reusable packaging

Packages and packing fitments that are reusable are to be identified.

C.10.4 Commercial packaging

Any non-service or commercial packaging is to be briefly described.

C.11 Staff

All staff implications for the logistic support of the ammunition system, including the maintenance of the system in-service, are to be stated. This is to include surveillance and final disposal.

C.12 Training requirements

C.12.1 Courses

Any special requirements for training ammunition technical staff such as special to the system courses are to be stated.

C.12.2 Training materials

Training materials, including inert cross-sectional instructional rounds, extra clothing or equipment needs are to be listed with their source of supply and deployment.

C.13 Safety

Any safety or health hazards associated with the ammunition, other than the obvious explosives hazards, which are apparent from its normal functioning, are to be stated.

C.14 Security classification

The security classification of the ammunition is to be stated and reference is to be given, if appropriate, to the relevant entries in any national list of classified equipment.

C.15 Management responsibilities

Organisations and agencies that have responsibilities for the ammunition system are to be detailed.

C.16 Additional information

This paragraph is to be used, if necessary, for management information that would be inappropriate to be included in any other section. It may include information on such matters as technical problems that resulted in design changes, or problems that affect storage or use of the ammunition.

Annex D
(informative)
Ammunition Management Policy Statement (AMPS) form example

1 AMMUNITION CONFIGURATIONS

DESIGNATION	ADAC	MANUFACTURER
Shell 155 mm H HE(L-INTR)M107	36012-11 36012-13	USA Iowa Ord Plant Louisiana Ord Plant Italy BPD
COMPONENTS		
Supplementary Charge of 151 g TNT Grade 1.		

2 GENERAL

2.1 **General Description.** A 155 mm HE shell. ADAC 36012-11 is filled TNT, ADAC 36012-13 is filled Comp B (RDX/TNT).

2.2 **Planned Role and Deployment.** Fired by all 155 mm Gun regiments at training in lieu of the more expensive 155 mm L15A2 HE shell.

2.3 **SR(L) Reference.** None.

2.4 **Approval.**

ADAC 36012-11: K/5113.
ADAC 36012-13: DGW(A) 155 mm AMM 0219.

2.5 **Associated Equipments.**

Howitzer 155 mm M109 A2/A3.
Howitzer 155 mm L121 (FH70).
Howitzer 155 mm AS 90.

2.6 **Deployment and Use by Other Nations.**

NATO: BE, CA, DA, FR, GE, GR, IT, NL, NO, PO, SP, TU and US.

2.7 **NATO/Quadripartite Interoperability Agreements.**

See AOP-6 (NATO interoperability in war) for interoperability agreements between BE, CA, DA, FR, GE, IT, NL, NO, PO, TU, UK, and US.

See AOP-14 (NATO interoperability in training) for interoperability agreements between UK and BE, UK and NL, UK and US.

3 PLANNED LIFE

3.1 **ISD.** 1966.	3.2 **QRD.**	3.3 **Design Shelf-Life.** None.
3.4 **Assessed Shelf-Life.** 25 years.		3.5 **Shelf-Life Extensions.** None.
3.6 **Arrangements for Turnover at Training.** Earliest manufactured shell are given priority for issue at training.		

4 SURVEILLANCE

4.1 **SQR.** 97.5%	4.2 **FLQ.** 92%	4.3 **OLQ.** 85%
4.4 **Surveillance Strategy.** Routine surveillance in the 3rd, 8th and 13th year of Service life, then every two years thereafter. Proof frequency as determined by LSA 6.		

5 AMMUNITION MAINTENANCE AND REPAIR POLICY

5.1 **Policy.** No maintenance required, ammunition repaired as and when required.
5.2 **Tools, Equipment and Materials Required for Maintenance and Repair**. No special tools, equipment, or materials required.

6 STORAGE

6.1 **NEQ.** 6.8 kg per round (same filling weight for both ADACs).
6.2 **Hazard Classification Codes.** 1.1D.
6.3 **Temperature Limits.** Approved for use in Climatic Categories A3, C0 and Cl.
6.4 **Stacking Limitations.** Maximum of six pallets high.
6.5 **Special Storage Requirements.** None.

7 TRANSPORTABILITY

7.1 **Special Requirements/Restrictions on Movement.** None.

7.2 **Shipping Stowage Category.**

Under deck - ordinary.
Above deck - secured.

7.3 **Air Drop.** Not approved.

8 DISPOSAL

The following details are provided as management information, and do not constitute authority for disposal action.

Ammunition is to be disposed of by detonation in accordance with A&ER Vol 3 Pam 21 Part 1 Procedure No. 1.

9 TECHNICAL PUBLICATIONS

A&ER Vol 3 Pam 6
Vol 3 Pam 20
Vol 3 Pam 41
Vol 3 Pam 46

TABs.

LUMAT.

RLC Statistics.

JSP 422/Defence Statistics (when published).

10 PACKAGING

10.1 **Authorized Service Packs.** See below.

10.2 **ULS.** ULS 245 (x 20).

10.3 **Expendable/Reusable Packaging.** ULS 245 is reusable, the tensile steel strapping used around the ULS is expendable.

10.4 **Commercial Packaging**. None.

11 MANPOWER

No special manpower requirements.

12 TRAINING REQUIREMENTS

12.1 **Courses.** None.
12.2 **Training Materials.** None.

13 SAFETY

No special safety precautions required.

14 ASSOCIATED ORDNANCE BOARD PROCEEDINGS

39449, 41985, 42529, 40242, 42359.

15 SECURITY CLASSIFICATION

UK Restricted.

16 MANAGEMENT RESPONSIBILITIES

16.1 **LSOR Sponsor.** LSOR 6	16.2 **PM.** PM Arty Guns/Ammo	16.3 **ES.** EME 7	16.4 **Ammo Man.** LSA 5
16.5 **Other.** None.			

17 ADDITIONAL INFORMATION

None.

Annex E
(informative)
Ammunition nomenclature - a guide to how to record ammunition

To ensure that an accounting system, whether written or IT based, works, each item has to be called the same name throughout by all operators, thereby allowing the system to be able to recognise it and match it up with similar items on the account.

To enable this function to work correctly every user will have to use the same method of recording the ammunition's details. As an example of where it could go wrong, a UK operator may call a complete small arms ammunition (SAA) item a 'round' (this is the term used when bullet, cartridge case and cap/primer are all present). A US operator would call this a 'cartridge'. Meanwhile, to confuse matters further, the UK operator would call a blank item of SAA a 'cartridge'. As is obvious this would cause huge problems on the system. To avoid this there must be a list of standard terms to be used, and all users must call items of ammunition using these terms. As long as exactly the same terms are used, ammunition management will run smoothly as far as individual ammunition items are concerned.

Another problem is the length of some nomenclatures (complete names) of ammunition items. If the complete name were entered on the accounting system, there would be a lot of words in there that do not match someone else's version completely. The system requires shorter terms in order to successfully match items up. To ensure an accounting system can work correctly there are examples of standard names and abbreviations further on in a table This is a list of British ammunition – it should be altered to reflect how a state identifies its ammunition, and should be in keeping with the types of ammunition that state possesses.

The name of item section on all identifying means is therefore divided into 4 distinct areas all of which can be matched up manually or by an IT based accounting system. Even if one of the parts is differently named by someone it will still be recognisable using the other three parts. It would be easier to use a catalogue numbering system, as in national (in UK, ADAC numbers) or NATO (T numbers) inventories, however the majority of the ammunition in many regions is likely to be of Soviet, Chinese or unknown origin and therefore will not have catalogue numbers. These can, however, be allocated by ammunition authorities.

The 'matchable' sections in the 'Ammunition Item' column will be filled in using the following order:

1. Type of Ammunition (i.e. Shell, Round, Grenade).

2. The delivery method, name of item, Calibre or similar (e.g. Hand, Rifle, 7.62mm).

3. The effect, intent or content of the ammunition (e.g. smoke, illuminating, irritant, smoke WP, HE).

4. Model number (e.g. L2A2, M1, DM34).

If there are items found where all 4 sections cannot be filled in there is the 'not known (nk)' option where the other information is completed, which should be enough information to match ammunition up with the same ammunition already on an account.

To get the correct nomenclature, use the following:

If the ammunition is in a SEALED box, use the markings on the box.
If it is in an unsealed box, empty the contents and check whether they are the same as marked on the box. If they are, repack them and mark the correct number of items on the box, then use the markings on the box to record them. If they are different, repack into separate boxes for different items and use the markings from the ammunition.
If the ammunition is loose, use the markings from the ammunition.

List of Names, Descriptions, Abbreviations and combinations to be used.

The table below contains the names and terms to be used and what items they refer to.

First Column -Name/Term	Ammunition item(s) it is used for	Examples (model numbers are sometimes fictitious and are added to show examples)
Bomb (Bomb Mor or Bomb AC)	Explosive munition, not subject to centrifugal forces and with a nearly vertical angle of descent, usually delivered from an aircraft or mortar (cf. Munition).	Bomb Aircraft GP 1,000kg Bomb Mortar 81mm HE L18
Cartridge (Cart)	An item without the projectile, eg a blank SAA cartridge, which is a cartridge case, propellant and cap; an Artillery propelling cartridge without the projectile or fuze, so case, propellant and primer stored separately from the shell and fuze.	Cartridge Propelling 105mm Fd Normal L35 Cartridge Blank 7.62mm L1A4 Cartridge Blank 13Pr 8oz GP L1A1
Charge (Chg)	Can be a propelling charge for use in artillery, mortars, and rockets, or as a component of rocket motors.	Charge Propelling 120 mm Tank HESH L3A2
Demolition Charge (Chg Dem)	A prepared demolition charge designed for a particular purpose. Often known by a colloquial name.	Chg Dem No1 6in Beehive Chg Dem No 11 30lb Nesting Chg
Demolition Accessory (Dem Acc)	Items which are designed for use in demolitions, ie det cord, safety fuze, ISFE, PE4 etc	Igniter Safety Fuze Electric Cord detonating L2A1
Detonator (Det)	A device containing a sensitive explosive intended to produce a detonating wave in response to some stimulus. It may be constructed to detonate instantaneously, or may contain a delay element.	Det Dem Elec L2A1 Det Dem Igniferous L1A1
EOD equipment (EOD)	Items used in the disposal of explosive devices or ammunition. Often known by a colloquial name. Can be Projector, Torch, Disruptor, Extractor, Breaker, Injector	Cartridge Injector L2A1 Pigstick Projector EOD L2 (Flatsword)
Fuze	A device that initiates an explosive train, can be found on explosive projectiles to make them function when required, eg time, proximity, point detonating.	Fuze Nose Percussion L2 Fuze Grenade Hand L36
Generator (Gen)	Smoke Generator is designed to produce, by combustion, a very rapid build up of a dense cloud of white smoke for screening purposes.	Generator Smoke L1
Grenade (Gren)	Munitions that are designed to be thrown by hand or to be launched from a rifle or dispenser.	Grenade Rifle 40mm HE AP L38

	Excludes rocket-propelled grenades (cf. Rocket). Note AP is anti-personnel.	Grenade Hand HE AP L2 Grenade Dispenser Smoke Screening L3A4 (Disp Smk Scr)
Guided Missile (GM)	Guided missiles consist of propellant-type motors fitted with warheads containing high explosives or some other active agent and equipped with electronic guidance devices.	GM AGM 114L (Longbow) GM Milan HEAT J103
Mine	An explosive munition designed to be placed under, on, or near the ground or other surface area and to be actuated by the presence, proximity, or contact of a person, land vehicle, aircraft, or boat, including landing craft.	Mine Anti Personnel M18A1 Mine Anti Tank L7
Primer (Prmer)	A self-contained munition that is fitted into a cartridge case or firing mechanism and provides the means of igniting the propellant charge.	Primer Percussion L17 Primer Elec L10
Rocket (Rkt)	Refers to a Munition consisting of a rocket motor and a payload, which may be an explosive warhead or other device. Can include guided and unguided missiles, although normally unguided missiles.	Rkt H/F Para Illum L5A4 Rkt 66mm HE A/Tk L14 Rocket System 84 mm AT4 Confined Space High Performance L1A2 (CS HP)
Round (Rd)	A complete item of ammunition to be fired from a weapon, eg for SAA the projectile (bullet), cartridge case, propellant and cap; for Artillery the filled shell (projectile), fuze, cartridge case or bag, propellant, and primer or tube. Can also be used for complete grenades for use with a launcher.	Round 5.56mm Ball L1A1 Round 105mm Pack Howitzer Training L65 (PH Trg) Round 120mm Tk HESH M21A3
Shell	Mainly for Artillery and Tank natures, where the shell (projectile) is separate from the propelling charge and can be with or without fuze.	Shell 105mm Fd Smoke Base Ejection L45A2 (Smk BE) Shell 120mm Tk HESH L31A7
Shot	A projectile without propelling method whose payload is non-explosive, ie a kinetic energy weapon.	Shot 120mm Tk APFSDS
Special Purposes and Engineer Assault (SP)	Items for specialised purposes, eg breaching minefields, destroying obstacles, Explosive Reactive Armour etc.	Anti Tank Mine Clearing Equipment L5 – Giant Viper Explosive Kit Rapid Cratering
Tube	A self-contained **munition** which is fitted into the breech of a gun when using bagged charges, ie the equivalent for Non-QF ammunition of a Primer. Provides the means of igniting the **propellant** charge.	Primer Percussion M82 (is a tube despite the US use of Primer) Tube Vent Elec 13mm L4A2

Completing the nomenclature for specific ammunition types.

Some possible combinations are below:

First Name or term	Second Name or term	Third Name or term	Model number Or Mark	Examples ammunition items matching the description
Bomb Mor	Calibre (eg 81mm, 60mm, 3in), so: _ _ _mm _ _ _ in nk	High Explosive (HE)	M1A1 L1A1 Mk 6 etc	HE bomb (fuze and carts fitted).
		Smoke Screening (Smk Scr)		Smk either from bomb body or smoke pots ejected.
		Illuminating (Illum)		Flare pot ejected in flight
		Smoke White Phosphorus (Smk WP)		Bursting bomb containing WP designed to produce an instant smoke screen.
		Smoke Emission (Smk Em)		Smk emits from holes in bomb body.
		Practice (Prac)		Solid or hollow with tracer
		Cluster Munition (Cl Mun)		No longer in NATO armies but many made elsewhere, UN CCM ban
Bomb AC	Weight or other unit of size (eg 500kg, 1000lb), so: _ _ _ _ kg _ _ _ _ lb nk	General Purpose (GP)		Normally HE (fuze fitted) w/o fuze
		High Explosive (HE)		Bulk HE (fuze fitted) w/o fuze
		Carrier		Carrier of cluster munitions or other payload.
Cart	Calibre or size (eg 105mm, 8in, 1.5in, 25pr), so: _ _ _ mm _ _in	Propelling (Prop)		For QF SF rounds, propellant
		Blank (Blk)		Artillery or SAA, no projectile
		Shotgun (SGun)		Named cartridges as the shot in integral to the cartridge case.

	_ _ bore nk	Signal (Sig)		Fires a signal flare
		Illuminating (Ilum)		Fires Illum flare and parachute
		Signal Smoke (Sig smk)		Fires Signal flare and smoke
		Augmenting (Aug)		For Mortar bombs
		Primary (Prim)		
Chg	Calibre (eg 155mm), so: _ _ _mm _ _in nk	Prop		Bagged charges for artillery, normally large calibres
Chg Dem	Weight, size or model number (eg 8oz, 1lb), so: _ _ _kg _ _ _lb _ _oz nk	Type of explosive, so: PE Sheet nk		Chg Dem 8oz PE4 Chg Dem 8oz PE3 Sheet Explosive (SX2) Explosive charges that are not designed for a specific target, so general use
Demolition Accessories and stores (DemSt)	Cord	Detonating		Transfers detonating wave
	Fuz	Instantaneous (Inst)		Fast burning cord to ignite igniferous detonators
		Safety (Saf)		Slow burning cord to ignite igniferous detonators
	Igniter	Saf Fuse Elec		Matchhead initiated electronically which passes flame to fuse
	Charge	Linear Cutting (CLC)		Size of CLC in comments column
	Expl Cutting Tape (ECT)	Blade		Size of Blade in comments
	Chg Dem	Lin Cutting (CDLC)		Size in comments

DemSt *(cont)*	Firing Device Kit (F Dev)	Dem Grip		Safety Fuze initiator
	nk	nk		Type in whatever useful info found
Detonator (Det)	Dem	Elec		Starts detonating wave, electrically fired
		Igniferous (plain)		Starts detonating wave, igniferously fired
		nk		Type in whatever useful info found
EOD Equipment (EOD)	Cart	Inj		Disrupts packages
	Torch	Pyrotechnic (Pyro)		Neutralises mines and light weight munitions
	Destructor (Dest)	Incendiary (Incd)		Destroy low or high explosives by burning
	Breaker (Brkr)	Window (Win)		Breaks windows
	Disruptor EOD (Dis)	Alpha Krait		IEDD Disruptor
		Splinter		Attack through window
	Extractor (Extr)	PawPaw, Poplin		Removes heavy cased objects
	Projector (Proj)	Flatsword or mini Flatsword		Slice through hard cased objects
	nk	nk		Type in whatever useful info found
	Calibre and Mor	Time		Smk BE, Illum, Fragmentation types, Carrier
		Point Detonating (PD)		Instant detonation of HE Mortar Bombs
		Delayed Action (DA)		Delayed detonation of HE Mortar Bombs
		Proximity (Prox)		For HE and A/Pers natures, allows above ground burst at optimum height

Fuze	Calibre and Arty	Time		Smk BE, Illum, Fragmentation types, Carrier – functions after programmed time, set to ensure optimum results
		Point Detonating (PD)		Instant detonation of HE shell
		Delayed Action (DA)		Delayed detonation of HE and fragmentation shell
		Proximity (Prox)		HE and A/Pers natures, above ground burst
	Calibre and Tank (Tk)	Time		For Illum, Smk Base Ejection
		Point Detonating (PD)		Instant detonation of HE, HEAT shell
		Delayed Action (DA)		Delayed detonation of HE Shell
		Proximity (Prox)		HE and A/Pers natures for optimum time/height of burst
		Base DA		For HESH to allow explosive to 'pancake' on target before initiation
	nk	nk		Type in whatever useful info found
Generator (Gen)	Smk	Model		Large, fairly slow build up of smoke
Grenade (Gren)	Dispenser (Disp)	Smk		From armoured vehicle dispensers
	Hand (Hd)	HE Defensive (HE Def)		Thrown, when defending in cover – maximum frag
		HE Offensive (HE Off)		Thrown, when attacking without cover – little frag, mainly blast
		Smk Emission (SmkEm)		Thrown – slow build up of smoke, often for signalling purposes
		Smk WP		Thrown – large volume of instant smoke
		Prac		Thrown
	Rifle (Rfl)	HE		Fired

		Smk		Fired
		Prac		Fired
	Launched (Lnch)	HE		From independent or underslung launcher
		Smk		From independent or underslung launcher
		Prac		From independent or underslung launcher
	nk	nk		Type in whatever useful info found
Guided Missile (GM)	Effect on target, so: Anti Tank (A/Tk)	Milan		Infantry weapon, APC
		Javelin (Jav)		US Infantry weapon
		Swingfire (Sfire)		Infantry weapon, APC
	Surface to Air (SAM)	High Velocity Missile (HVM)		Artillery fired, man portable, APC or multiple launcher, Short range
		Rapier (Rap)		Artillery fired, Long range
	Air to Ground (AGM)	Hellfire (Hfire)		Attack Helicopter Armour defeating
		Longbow (LBow)		Attack Helicopter Armour defeating
	Multi Launch Rocket system (MLRS)	Unitary – complete (Unita)		Full ‘missile’ – guided to a certain extent. HE Warhead
		HE Sub Munition – complete (HESub)		Full ‘missile’ with 644 sub-munitions
		Sub Munition (Submu)		644 x M77 (NATO Version) per payload
		Guidance Section (GS)		Front, GPS guided
		Payload Sub Mun (PaySM)		644 x M77 (NATO Version)
		Payload Section (PayS)		Middle, HE warhead, approx 25kg
		Propulsion Section (ProS)		Rear propulsive section – solid or liquid propellant

	nk	nk		Type in whatever useful info found
Mine	Anti Personnel (AP)	Metallic (Met)		Small, designed to maim rather than kill
		Non Metallic (NonMt)		Small, designed to maim rather than kill
	Anti Tank (ATk)	Metallic (Met)		Large, may be directional
		Non Metallic (NonMt)		Large, may be directional
	Projector Area Defence	Command only (Com)		Claymore type, command – directional mass fragmentation
		Command or Victim (Vic)		Claymore type, command or victim - directional mass fragmentation
	nk	nk		Type in whatever useful info found
Primer (Prmer)	Percussion (Perc)	Push Screw		Initiate propellant in cart case
	Electric (Elec)			Initiate propellant in cart case
	nk	nk		Type in whatever useful info found
Rocket (Rkt)	Calibre (66mm HE A/Tk, 1.5in H/F) so: _ _ _mm _ _ _ in nk	Flare		Signalling
		Signal (Sig)		Coloured signal
		Illuminating (Illum)		Light up area
		HE		A/Tk, A/Pers etc – recoiless, shoulder fired
		Incendiary (Incdy)		To ignite
Round (Rd)	Calibre (5.56mm,	Ball		Kill
		Tracer		Follow trajectory of projectile
		Incendiary		Ignite
		Blank		Practice, training
		Armour Piercing		Light armour

Round *(cont)*	.303in, 76mm) so: _ _ _mm _ _ _ in _ _ _pr nk	Ball Tracer mix (BT)		Mixture qty, e.g. 4B1T, 1B1T for machine gun
		Small Arms Spotter (SAAsp)		Indicate target
		HE		Bulk HE
		High Explosive Anti Tank (HEAT)		Shaped charge, anti armour
		Smk Base Emission (SmkBE)		Slow build up of smoke screen
		Illuminating (Illum)		Light up area
		HESH		Anti armour, flattens to target
		Armour Piercing Discarding Sabot (APDS)		High speed kinetic penetrator
		Armour Piercing Fin Stabilised Discarding Sabot (APFSDS)		Very accurate high speed penetrator
		Smk WP		Quick smoke build up
		Spotting (Spot)		Target Indicating
		AP Secondary Effect (APSE)		Tracer, colour, origin
		AP Secondary Effect Incendiary (APSEI)		Tracer, colour, origin
Shell	Calibre or weight (105mm, 8in, 76mm, 25pr) so: _ _ _mm _ _ _ in _ _ _pr nk	HE		Bulk HE W/fuze W/O fuze
		High Explosive Anti Tank (APDS)		Shaped charge, anti armour
		Smk Base Emission (SmkBE)		Slow build up of smoke screen
		Illuminating (Illum)		Light up area

		HESH		Anti armour, flattens to target
		Smk WP		Quick smoke build up
		Spotting (Spot)		Target Indicating
Shot	Calibre or weight (105mm, 8in, 76mm, 25pr) so: _ _ _mm _ _ _ in _ _ _pr nk	Solid Shot (Shot)		Kinetic penetrator
		Armour Piercing Discarding Sabot (APDS)		High speed kinetic penetrator
		Armour Piercing Fin Stabilised Discarding Sabot (APFSDS)		Very accurate high speed penetrator
Special Purposes and Engineer Assault (SP)	Charge Dem	Bangalore Torpedo (BaTor)		To breach obstacles such as barbed wire
		Expl Kit Rapid Cratering (EKRC)		To make large holes in roads, runways etc
		Rapid Bridge Dem System (RBDS)		Destroy bridges
	Expl Reactive Armour (ERA)	Not Applicable (NA)		Reacts to external explosion
	Giant Viper (Viper)	Rocket (Rkt)		Pulls hose from cartridge
		Hose		HE filled, clears A/Tk minefields
	nk	nk		Type in whatever useful info found
Tube	Percussion (Perc)	Push Screw		Initiate propellant in bagged charge
	Electric (Elec)			Initiate propellant in bagged charge
	nk	nk		Type in whatever useful info found

Note: when, in column 2, a weight or measurement is used, the options available should be ‘millimetres’ (mm), ‘inches’ (in), ‘kilograms’ (kg), ‘pounds’ (lb), ‘pounder’ (pr) or ‘ounces’ (oz). The number shall be typed in before the measurement unit, e.g. 120mm, and so on.

Amendment record

Management of IATG amendments

The IATG are subject to formal review on a five-yearly basis. This does not preclude amendments being made within these five-year periods for reasons of operational safety, efficacy and efficiency or for editorial purposes.

As amendments are made to this IATG module they will be given a number, and the date and general details of the amendment will be shown in the table below. The amendment will also be shown on the cover page of the IATG by the inclusion of the amendment number and date.

As the formal reviews of each the IATG module is completed, new editions will be issued. Amendments will be incorporated into the new edition and the amendment record table cleared. Recording of amendments will then start again until a further review is carried out.

The most recently amended, and thus extant, IATG module is posted on www.un.org/disarmament/ammunition

Number	Date	Amendment Details
0	01 Feb 15	Release of Edition 2 of IATG.
1	31 March 21	Release of Edition 3 of IATG.