

# INTERNATIONAL AMMUNITION TECHNICAL GUIDELINES

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## **Policy development and advice**

### **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](http://www.un.org/disarmament/ammunition)

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## 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.<sup>1</sup> In recognition of these dual threats of explosion and diversion, the General Assembly requested the United Nations to develop **guidelines for adequate ammunition management**.<sup>2</sup> 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](http://www.un.org/disarmament/ammunition).

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<sup>1</sup> S/2008/258.

<sup>2</sup> 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

Stockpile management is a wide-ranging term when applied to ammunition and explosives, as it also covers areas such as the determination of stockpile size, the types of stockpiles and the management of ammunition in service. These areas are in addition to the specific technical areas of security and safety of stockpiles.

Ammunition and explosives may deteriorate or become damaged unless they are correctly stored, handled and transported, with the effect that they may fail to function as designed and may become dangerous in storage, handling, transport and use. Stockpile management in accordance with best practices is an important component in ensuring that a national authority fulfills its 'Duty of Care' in ensuring that an ammunition stockpile is correctly looked after.

Safe, effective and efficient stockpile management can also enhance security capability as it ensures that best 'value for money' is obtained from ammunition, which is an expensive commodity in bulk. Stockpile management is an important national responsibility and one of the most effective mechanisms for optimizing safety in storage and reducing security risks of loss, theft, leakage or proliferation. It is therefore important that national authorities adhere to basic principles, and that improvements in stockpile management, where needed, are made in an integrated and graduated manner as resources become available.

Effective stockpile management is as much about developing appropriate procedures, processes and systems as it is about storage and security infrastructure. Infrastructure is expensive, but significant improvements in safety and security can be made at minimal costs with system and process improvements. Changes of attitude and the development of an ethos of explosive safety can have a major impact on reducing the global number of undesirable explosive events within ammunition storage areas. A similar approach to the security of ammunition stockpiles would make a major contribution towards reducing the risks of illicit diversion of ammunition.

The other IATG modules provide detailed guidelines for the safety, security and destruction of ammunition and explosives, whilst this module concentrates on the principles and strategic overview of stockpile management in terms of wider ammunition management responsibilities.

## Policy development and advice

### 1 Scope

This IATG module introduces the principles and requirements of a safe, efficient and effective conventional ammunition stockpile management system and provides guidelines on policy development and advice. It contains information that policy makers at the strategic level should be aware of when dealing with conventional ammunition stockpile management issues.

### 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 guideline the following terms and definitions, as well as the more comprehensive list given in 01.40 *Glossary of terms, definitions and abbreviations*, shall apply.

The term 'national authority' refers to *the government department(s), organisation(s) or institution(s) charged with the regulation, management, co-ordination and operation of conventional ammunition stockpile management activities*.

The term 'stockpile management' refers to those *procedures and activities regarding safe and secure accounting, storage, transportation and handling of ammunition and explosives*.

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 International instruments and standards

There is a limited range of international or supra-national legislation and international standards that are applicable to the management of conventional ammunition.

## 4.1 Ammunition destruction

### 4.1.1. Anti-Personnel Landmine Ban Convention<sup>3</sup>

Article 4 of this convention, which entered into force on 01 March 1999, requires that, *except as provided for in Article 3, each State Party undertakes to destroy or ensure the destruction of all stockpiled anti-personnel mines it owns or possesses, or that are under its jurisdiction or control, as soon as possible but not later than four years after the entry into force of this Convention for that State Party.*

### 4.1.2. Convention on Cluster Munitions<sup>4</sup>

Article 3(2) of this convention, which entered into force on 01 August 2010, requires that State Parties *shall destroy or ensure the destruction of all cluster munitions referred to in paragraph 1 of this Article as soon as possible but not later than eight years after the entry into force of this Convention for that State Party. Each State Party undertakes to ensure that destruction methods comply with applicable international standards for protecting public health and the environment.*

## 4.2 Counter-proliferation

### 4.2.1. UN Firearms Protocol<sup>5</sup>

Article 6 of the UN Firearms Protocol requires that States that have ratified the treaty *shall adopt, within their domestic legal systems, such measures as may be necessary to prevent illicitly manufactured and trafficked firearms, parts and components and ammunition from falling into the hands of unauthorized persons by seizing and destroying such firearms, their parts and components and ammunition unless other disposal has been officially authorized, provided that the firearms have been marked and the methods of disposal of those firearms and ammunition have been recorded.* These requirements, already agreed upon by many States, are a core component of this IATG module for illicitly manufactured and trafficked ammunition that may be seized.

### 4.2.2. Arms Trade Treaty<sup>6</sup>

Article 3 of the Arms Trade Treaty requires States Parties to *establish and maintain a national control system to regulate the export of ammunition/munitions fired, launched or delivered by the conventional arms covered under Article 2 (1), and shall apply the provisions of Article 6 (Prohibitions) and Article 7 (Export and Export Assessment) prior to authorizing the export of such ammunition/munitions.*

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<sup>3</sup> *Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction.* Ottawa. 18 September 1997.

<sup>4</sup> *Convention on Cluster Munitions.* Dublin. 30 May 2008.

<sup>5</sup> United Nations General Assembly Resolution A/RES/55/255. *Protocol against the illicit manufacturing of and trafficking in firearms, their parts and components and ammunition supplementing the United Nations Convention against Transnational Organized Crime.* 08 June 2001. 'The Firearms Protocol'. (Entered into Force on 03 July 2005).

<sup>6</sup> The Arms Trade Treaty (ATT) is an international treaty that regulates the international trade in conventional arms and seeks to prevent and eradicate illicit trade and diversion of conventional arms by establishing international standards governing arms transfers. The Treaty came into force on 24 December 2014.



## 4.3 Environmental

### 4.3.1. International environmental legislation

Ammunition and explosives are considered to be hazardous or industrial waste and as such fall under the remit of international treaties that have been signed and ratified:

- a) *London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter*, 29 December 1972;
- b) *the 1996 Protocol to the London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (Amended 2006)*; and
- c) *Convention for the Protection of the Marine Environment of the North-East Atlantic*, 1998.<sup>7 8</sup>

Ammunition and explosives shall therefore not be dumped at sea by States that have ratified and signed the above treaties and should not be dumped at sea by States not party to these agreements.

The United Nations shall not support any ammunition disposal activities that utilise deep sea dumping.

### 4.3.2. Supra-national environmental legislation

Supra-national legislation that covers emissions into the atmosphere from the incineration of hazardous waste is the European Union Council Directive 2000/76/EC: *The incineration of waste*, 04 December 2000, amended by Regulation (EC) No 1137/2008 of 11 December 2008.

European Union Council Directive 2008/98/EC *Waste*, 19 November 2008 contains provisions on the management of waste. These should be applied to industrial ammunition demilitarisation processes.<sup>9</sup>

The directives provide a comprehensive standard and are in use by all European Union countries and those countries with associate status. States should reflect the requirements of these directives in their own national environmental legislation where it relates to the destruction of ammunition.

### 4.3.3. International environmental standards

#### ISO 4220 (E) Measurement of air pollution

ISO 4220 (E) lays down internationally accepted standards for the determination and measurement of air pollution from industrial processes. These standards should apply to any pollution control systems used during industrial demilitarisation operations, ([www.iso.ch](http://www.iso.ch)), but only in terms of the measurement of emissions. The standard does not provide any guidance on what the overall emission limits should be; this remains the responsibility of the national authority.

#### ISO 9612: (E) Acoustics

ISO 9612 *Determination of occupational noise exposure – Engineering method* may be applied to open detonation destruction operations.

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<sup>7</sup> Also known as the *OSPAR Convention*.

<sup>8</sup> Entered into force on 25 March 1998 and replaced the *1972 Oslo Convention*.

<sup>9</sup> Article 2, Paragraph 1(e) of the subsequent European Union Council Directive 2008/98/EC *Waste and repealing certain Directives*, 19 November 2006 excluded explosive waste from the provisions of Directive 2008/98. However, non-explosive hazardous waste products from the processing of explosives during demilitarization operations would be covered by this directive.

## 5 Functional areas of ammunition stockpile management

The national authority should implement a conventional ammunition stockpile management system that ensures that policy, organisations, resources and operating procedures are developed and made available for the requirements shown within the functional areas at Table 1. The IATG module that contains the appropriate guidance to support these requirements is also listed in the table.

Functional Area	Requirements	IATG
<b>Ammunition Management</b>	<ul style="list-style-type: none"> <li>▪ Inventory Management</li> <li>▪ Risk Management Principles and Processes</li> <li>▪ Procurement System and Procedures</li> <li>▪ UN Explosive Hazard Classification System and Codes Accident, Fault and Performance Failure Investigation Capability, Bans, Constraints and Procedures</li> <li>▪ Ammunition Surveillance and In-Service Proof</li> </ul>	<ul style="list-style-type: none"> <li>▪ IATG 03.10</li> <li>▪ IATG 02.10</li> <li>▪ N/A<sup>10</sup></li> <li>▪ IATG 01.50</li> <li>▪ IATG 01.60, 01.70, 11.10 and 11.20</li> <li>▪ IATG 07.10</li> </ul>
<b>Ammunition Storage</b>	<ul style="list-style-type: none"> <li>▪ Depot Storage Procedures and Operations</li> <li>▪ Safe Depot Storage Infrastructure</li> <li>▪ Unit Storage Procedures and Operations</li> <li>▪ Small Unit and Multi-National Operations Safe Storage</li> </ul>	<ul style="list-style-type: none"> <li>▪ IATG 06 Series</li> <li>▪ IATG 05 Series</li> <li>▪ IATG 06 Series</li> <li>▪ IATG 12 Series</li> </ul>
<b>Ammunition Processing</b>	<ul style="list-style-type: none"> <li>▪ Ammunition Inspection Capability, Procedures and Risk Reduction</li> <li>▪ Ammunition Maintenance Capability and Procedures</li> <li>▪ Ammunition Repair Capability and Procedures</li> <li>▪ Ammunition Process Building Infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>▪ IATG 06 Series and 07 Series</li> <li>▪ IATG 06 Series and 07 Series</li> <li>▪ IATG 06 Series</li> <li>▪ IATG 05 Series</li> </ul>
<b>Ammunition Disposal</b>	<ul style="list-style-type: none"> <li>▪ Identification of Ammunition for Disposal Methodology</li> <li>▪ Disposal Technology and Infrastructure</li> <li>▪ Disposal Capability and Procedures</li> </ul>	<ul style="list-style-type: none"> <li>▪ IATG 03.10</li> <li>▪ IATG 10.10</li> <li>▪ IATG 10.10</li> </ul>
<b>Ammunition Security</b>	<ul style="list-style-type: none"> <li>▪ Physical Security Infrastructure of Explosive Storage Areas</li> <li>▪ Security System Capability and Procedures</li> <li>▪ Vetting System for Staff</li> </ul>	<ul style="list-style-type: none"> <li>▪ IATG 09.10</li> <li>▪ IATG 09.10</li> <li>▪ IATG 09.10</li> </ul>
<b>Ammunition Transport</b>	<ul style="list-style-type: none"> <li>▪ Transport Procedures in accordance with International and National Legislation</li> <li>▪ Intrinsically Safe Vehicles</li> </ul>	<ul style="list-style-type: none"> <li>▪ IATG 08.10</li> <li>▪ N/A<sup>11</sup></li> </ul>

Table 1: Functional areas of conventional ammunition stockpile management

## 6 Philosophy and principles of ammunition stockpile management

The national authority for conventional ammunition stockpile management should ensure that the following philosophy and principles are adhered to at all levels of planning and operational activity. They are designed to contribute to safe, secure, effective and efficient conventional ammunition stockpile management.

<sup>10</sup> National responsibility.

<sup>11</sup> In accordance with international legislation contained within IATG 08.10: *Transport of ammunition*

## 6.1 Philosophy

The philosophy of a safe, secure, effective and efficient conventional ammunition stockpile management system should be to *ensure the implementation of certain minimum protection criteria for personnel and property, whilst maintaining effective security and control of ammunition and explosives.*

## 6.2 Protection criteria principles

The principles of minimum protection criteria shall be:

- a) to expose the minimum number of persons to ammunition and explosives;
- b) to ensure that such persons are physically exposed to ammunition and explosives for the minimum amount of time;
- c) to ensure that all personnel responsible for, and participating in, the stockpile management of ammunition and explosives receive appropriate technical training;
- d) to ensure that all operational activities are supported by an effective risk management process;
- e) to ensure that ammunition and explosives are maintained in a physically and chemically safe condition; and
- f) to maintain the quantity of ammunition and explosives at the minimal level commensurate with national security needs.

## 6.3 Security and control principles

The principles of effective security and control shall be that:

- a) physical security systems should be derived from an effective risk assessment process;
- b) physical security should be built into new storage facilities at the design stage;
- c) an effective perimeter security infrastructure shall be in place;
- d) access shall be controlled at all times;
- e) access shall be restricted to authorised personnel only;
- f) only trusted individuals, who have been security cleared, shall be nominated as authorised personnel to work within the facility;
- g) temporary personnel should be accompanied at all times; and
- h) effective inventory management systems should be implemented.

## 7 Risks and safety management principles

### 7.1 Overview of risk

Inadequately managed conventional ammunition stockpiles constitute a significant danger to public safety and security. While it is the prerogative of each State to determine the system of stockpile management that is most suited for its national defence and security purposes, the issue has been of growing concern to the international community because of: 1) the impact on social and economic development; and 2) the cross-border consequences of poorly managed stockpiles.

The most salient risk posed by the accumulation of conventional ammunition surpluses is that of explosive events in ammunition storage areas. More than half of the world's countries have

experienced an ammunition storage area explosion over the past few decades, resulting in severe humanitarian and socioeconomic consequences. These events can result in large numbers of casualties, widespread destruction of infrastructure, and the disruption of the livelihood of entire communities. In addition to the immediate human suffering, such explosions can have terrible effects on the environment. In States with limited means to finance the technically challenging clean-up costs, local populations, especially children, are exposed to the risk of injury or death due to explosive ordnance that tends to litter large areas for extended periods of time after the explosion.

Improper ammunition management is also at the root of diversion of ammunition to illicit markets and onward proliferation thus fueling armed conflict, terrorism and crime.

Stockpile management organisations should therefore develop and implement an integrated and graduated risk management process designed to progressively reduce or mitigate risk as more resources become available. (See IATG 02.10 *Risk management principles and processes*).

## 7.2 Safety management principles

Safety management systems should be derived from the risk management process and should be designed to achieve tolerable risk by constantly improving safety. Although improving safety demands investment of time and resources, even a relatively modest effort can increase safety levels significantly. Practical measures need to remain realistic and affordable, and thus can be developed in a graduated manner. The following safety management principles should be applied:

- a) a formal safety management system (SMS) should be developed and implemented. This includes the organisational structure, processes, procedures and methodologies used to direct and control stockpile management activities;
- b) a formal safety management plan should be developed and promulgated to all levels. It should define the organisational structure of the SMS and explain how safety is to be achieved; and
- c) a set of safety requirements or procedures should be established that conform to legislation, policy and the appropriate international or national standards.

## 8 Types of stockpiles

There may be a range of individual ammunition and explosive stockpiles within a country, that are under the control of separate organisations (such as the police, military (both active and reserve), border guards, ammunition production company holdings etc), but each may have the following generic parts:

- a) operational ammunition and explosives;<sup>12</sup>
- b) war reserve ammunition and explosives;<sup>13</sup>
- c) training ammunition and explosives;<sup>14</sup>
- d) experimental ammunition and explosives (if a producing nation);<sup>15</sup>

<sup>12</sup> The ammunition and explosives necessary to support the routine operations of military, police and other security agencies over an agreed period of time. This also includes ammunition for use during Internal Security operations.

<sup>13</sup> 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 of time, (usually 30 days at intensive expenditure rates).

<sup>14</sup> 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, (which could be up to 15% of the war reserve).

<sup>15</sup> These holdings will be minimal but must be included for intellectual accuracy.

- e) production ammunition (if a producing nation);<sup>16</sup> and
- f) ammunition and explosives awaiting disposal (unsafe or surplus stocks).<sup>17</sup>

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 MOSAIC 03.30 *National controls over the access of civilians to SALW*, and not in accordance with this IATG module.

## **9 Ammunition management policy issues**

### **9.1 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 for it to be 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 and assist in the timely and reliable detection of diversions, but should also be designed to ensure that best 'value for money' is obtained from the ammunition.

### **9.2 Ammunition management policy statements**

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) for each type of ammunition. AMPS may be used to define 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. (See IATG 03.10 *Inventory management*).

### **9.3 Stock accounting systems**

An essential component of stockpile safety is having the ability to know where each item of ammunition is stored (down to lot, batch and/or serial number level and component parts).<sup>18</sup> The lot or batch is a means of identifying ammunition items that contain parts or explosives manufactured under homogenous conditions at the same time and place. This means that should there be a fault, which impacts on safety, all ammunition of that type can be rapidly identified, a ban may be placed on its issue and remedial action taken. Without this level of detail the technical surveillance and in-service proof of ammunition is ineffective and unsafe ammunition cannot be identified. Consequently, users are placed at unnecessary risk, and there is a possibility of undesirable explosive events taking place within the ammunition storage areas.

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

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<sup>16</sup> 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.

<sup>17</sup> The ammunition and explosives that have been identified as unserviceable, unstable or surplus to requirements.

<sup>18</sup> Further details on lotting and batching are at IATG 03.10 *Inventory management* and IATG 03.20 *Lotting and batching*.

## 9.4 Financial accounting systems

The national authority should also develop financial accounting systems to identify the true costs of procuring, maintaining and final disposal of the defence stockpile. These costs<sup>19</sup> will include:

- a) initial procurement costs, (which will include research, development and purchase costs);
- b) additional training requirements;
- c) stockpile security costs<sup>20</sup>;
- d) stockpile storage costs;
- e) stockpile maintenance and repair costs; and
- f) final disposal costs.

Once the ammunition has reached the end of its useful shelf life it may well be the case that disposal of the ammunition is a cheaper option, in the mid to long-term, than continued storage. The financial accounting system should be sophisticated enough to enable management to make such decisions.

## 9.5 Ammunition classification and shelf life

All ammunition and explosives should be classified<sup>21</sup> as to their condition, which will require a surveillance and in-service proof system.<sup>22</sup> The ammunition condition is used to define the degree of serviceability of the ammunition and the degree of any constraints imposed on its use.<sup>23</sup>

Policy makers should also be aware that ammunition 'shelf life' is an indication of the performance capability of the ammunition, and not 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.

## 10 Storage infrastructure issues

The purpose of ammunition storage infrastructure is to:

- a) protect the ammunition from explosive events in neighbouring explosive storehouses (ESH);
- b) mitigate the effects on the local environment of an internal explosion within the ESH;
- c) protect the ammunition from harsh environmental conditions, thereby allowing it to either achieve or prolong its designed service life; and
- d) maintain a secure environment in which ammunition may be protected from external theft or other forms of diversion.

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<sup>19</sup> To include infrastructure, depreciation of infrastructure, operating and staff costs over the anticipated life of the ammunition.

<sup>20</sup> To include infrastructure, depreciation of infrastructure, operating and staff costs over the anticipated life of the ammunition for each sub-clause item.

<sup>21</sup> Best ammunition management practice also 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)

<sup>22</sup> See IATG 07.10 *Surveillance and proof* for further details.

<sup>23</sup> See IATG 03.10 *Inventory management* for further details.

Although one of the purposes of ammunition storage infrastructure is to mitigate the effects of an internal explosion, protection of the local area is also achieved by the imposition of separation or quantity distances.<sup>24</sup> The robustness and design of the storage infrastructure, together with the type of exposed site, will then determine the appropriate separation distance to be applied for the safety of that exposed site. The less robust the storage infrastructure the greater the separation distance required, until a maximum separation distance required for the storage of ammunition in the open (in effect field storage) is reached.

Ammunition may be stored under temporary storage conditions if appropriate danger areas and security are applied, but such storage will inevitably reduce the in-service life of the ammunition. This will mean that replacement stocks will need procuring earlier than anticipated, and therefore, as many types of ammunition are expensive, cost benefit analysis may prove that storage infrastructure improvements are the most cost-effective solution over the longer term.

Designs, drawings and specifications are widely available for high standard explosive storehouses (ESH), such as the NATO standard 'earth-covered magazine or "igloo" as they have been called historically, but these are resource-expensive and beyond the current means of many national authorities. In such cases explosion consequence analysis (ECA) should be conducted to evaluate the risks to local communities, and then appropriate remedial action<sup>25</sup> taken until more effective storage infrastructure is available.

## **11 Surplus ammunition indicators and procedures**

### **11.1 Introduction**

Each State shall be responsible for deciding the type and quantity of ammunition necessary for its security forces<sup>26</sup> to achieve their constitutional or legally mandated tasks, although such stockpile levels should be necessary, reasonable and justifiable. It therefore follows that each State shall decide when stockpiled ammunition is surplus to its national security requirements.

In order to decide on surplus stockpile levels the national authority should have a system in place that identifies surpluses; without such systems States may not even realise that they are paying for the unnecessary maintenance and storage of redundant stocks of conventional ammunition.

### **11.2 Planning criteria**

National defence and security strategies or policies should provide the basic planning assumptions that determine military, policing and security tasks, the operational concepts and hence the size, organisational structure and equipment requirements of the security forces.

Stockpile surpluses may occur and should be identified when:

- a) there are major changes to the national security and/or defence strategy or policy (threat, politically, technology or financially led);
- b) security sector reform activities involve the restructuring and downsizing of security forces;
- c) major organisational changes are made to security forces;
- d) weapons and/or ammunition fail to reach desired performance requirements;
- e) ammunition becomes unsafe in storage; and

<sup>24</sup> See IATG 02.20 *Quantity and separation distances* for further details.

<sup>25</sup> This may include: 1) storage infrastructure improvements; 2) a temporary or permanent reduction of stock levels at the site; 3) closure of the site; or 4) political acceptance of the risk to the local community.

<sup>26</sup> Military, Police, Gendarmerie, Border Guards and other security agencies.

- f) re-equipment programmes make weapons obsolete or obsolescent, hence there is no longer a need for the ammunition.

### 11.3 Parameters for equipping security forces

The following parameters should determine the types and quantities of weapons in the national stockpile, from which ammunition requirements can be calculated:

- a) the number of personnel in the security forces;
- b) the organisation of the security forces;
- c) the national perception of a given security environment;
- d) the equipment needs of the security forces, based on capability requirements and logistical procedures;
- e) current holdings of weapons and their effectiveness for future tasks;<sup>27</sup> and
- f) available financial resources.

### 11.4 Calculation requirements

Advice on the calculation of weapon requirements may be found in MOSAIC 05.20 *Stockpile management; Weapons* (Clause 11.4 and Annex F).

Ammunition requirements to support the security forces may be estimated by use of the Daily Ammunition Expenditure Rate (DAER) system. The advantage of such a system is that it may be used by all levels of the security forces during peace and on operations. It can be used as an operational combat supplies planning tool (by all unit types and size) as well as a simple means of determining required national stockpile levels.

#### 11.4.1. Daily ammunition expenditure rates (DAER)

The Daily Ammunition Expenditure Rate (DAER)<sup>28</sup> for a specific type of ammunition is the estimated amount of ammunition that a single equipment (such as an artillery gun) will use in one day of combat or conflict at a certain intensity. These figures are usually classified and should be determined by operational analysis. For example, the DAER for a 152mm Gun, at intensive war rates, may be 300 rounds per day, therefore to sustain an Artillery Battery of 8 Guns, over a 30 day-period at intensive war rates would require 72,000 rounds of ammunition. An example spreadsheet to calculate this may look like this:

EQUIPMENT	DAER				FORCE EQPT LEVEL	DAYS	FORCE DAER SUSTAINABILITY REQUIREMENT			
	IS <sup>29</sup>	PSO <sup>30</sup>	GW (L) <sup>31</sup>	GW (I) <sup>32</sup>			IS	PSO	GW (L)	GW (I)
Rifle 5.45mm Ball	5	20	60	120	600	30	9000	360K	1.08M	2.16M
Rocket A/Tk RPG 7	0	1	4	20	100	30	0	3,000	12K	60K
Mortar 60mm HE	0	1	10	20	40	30	0	1,200	12K	24K
152mm Gun HE	0	0	50	200	20	30	0	0	30K	120K

<sup>27</sup> For example, can operational weapons be transferred to reservist weapons?

<sup>28</sup> More information on the use of a DAER system is in IATG 03.10 *Inventory management*.

<sup>29</sup> Internal Security Operations.

<sup>30</sup> Peace Support Operations.

<sup>31</sup> General War (Light Rates).

<sup>32</sup> General War (Intensive Rates).



**Table 2: Example DAER calculation**

The defence stockpile may then be calculated from an analysis of the DAER sustainability requirements to support the national defence and security strategy. For example, it may be decided that the initial defence stockpile should be made of the following DAER components:

- |    |                               |   |   |
|----|-------------------------------|---|---|
| a) | Operational Stocks (Police)   | - | 30 DAER at Internal Security Operations rates;      |
| b) | Operational Stocks (Military) | - | 10 DAER at General War (Light) Rates; <sup>33</sup> |
| c) | War Reserve                   | - | 25 DAER at General War (Intensive) Rates; and       |
| d) | Training Stocks               | - | up to 15% of War Stockpile                          |

The rate of ammunition usage at training, or on operations, and the condition of the ammunition over a period of time will then determine the restocking requirements of the defence stockpile. National authorities may choose to select a percentage reorder level, at which point new stocks are procured, whilst surplus stocks are then disposed of.

### 11.5 Surplus ammunition

Surplus ammunition<sup>34</sup> should therefore be the total of:

- a) ammunition that exceeds the stockpile level requirements of the national stockpile for in-service weapon systems;
- b) ammunition that is now obsolete or obsolescent;
- c) ammunition for which weapon systems are no longer held;
- d) ammunition that has exceeded its serviceable life and has been declared for disposal by the national authority.

This surplus ammunition should be:

- a) officially declared as surplus to national security or defence requirements;
- b) taken out of service;
- c) recorded by type, lot, batch and/or serial number;
- d) stored separately; and preferably destroyed or demilitarized (in accordance with IATG 10.10 Ammunition demilitarization and destruction).

## 12 Planning for Support to UN Operations

In December 2015, the General Assembly adopted a resolution<sup>35</sup> that welcomed the continued application of the IATG in the field, including the implementation software and training materials, and encourages, in this regard, the safe and secure management of ammunition stockpiles in the planning and conduct of peacekeeping operations, including through the training of personnel of national authorities and peacekeepers, utilizing IATG.

<sup>33</sup> With PSO ammunition coming from this stockpile.

<sup>34</sup> There are no extant international legislation, instruments or agreements that define surplus weapons. The planning criteria in this Clause have been derived from suggested surplus indicators within the *OSCE Document on SALW* of 24 November 2000.

<sup>35</sup> UN General Assembly (UNGA) Resolution A/RES/72/55, *Problems arising from the accumulation of conventional ammunition stockpiles in surplus*.

IATG 12.10 provides basic planning guidance for Troop/Police Contributing Countries (T/PCC) by detailing key Force-level explosives safety and risk management roles and responsibilities, and required competencies. It establishes the minimum IATG requirements that should be applied to ensure the safety of unit personnel and the public by providing a table that points to appropriate IATG modules and clauses to at least meet RRPL 1, and higher RRPL if possible. The module additionally requires that all T/PCC providing ammunition certify that their ammunition deployed in support of a UN multi-national operation is 'safe to deploy'.

In order for T/PCC supporting UN operations to more effectively implement IATG 12.10 requirements when operating on a UN base, national efforts are required to develop awareness and understanding of such requirements. Developing capability and trained personnel as part of a national program is critical to successful operations and the safe management of ammunition.

## **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) IATG 01.40 *Terms, glossary and definitions*. UNODA. 2015;
- a) IATG 01.50 *UN Explosive hazard classification system and codes*. UNODA. 2015;
- b) IATG 02.20 *Quantity and separation distances*. UNODA. 2015;
- c) IATG 03.10 *Inventory management*. UNODA. 2015;
- d) IATG 07.10 *Surveillance and proof*. UNODA 2015; and
- e) IATG 08.10 *Transport of ammunition*. UNODA. 2015.

The latest version/edition of these references should be used. The UN Office for Disarmament Affairs (UNODA) holds copies of all references<sup>36</sup> used in this guideline and these can be found at: [www.un.org/disarmament/un-safeguard/references/](http://www.un.org/disarmament/un-safeguard/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/convarms/ammunition/](http://www.un.org/disarmament/convarms/ammunition/). National authorities, employers and other interested bodies and organisations should obtain copies before commencing conventional ammunition stockpile management programmes.

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<sup>36</sup> 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) *Handbook of Best Practices on Conventional Ammunition*. Decision 6/08. OSCE. 2008;
- b) MOSAIC 03.30 *National controls over the access of civilians to SALW*. UNODA. 2015; and
- c) MOSAIC 05.20 *Stockpile management; Weapons*. UNODA. 2012.

The latest version/edition of these references should be used. The UN Office for Disarmament Affairs (UNODA) holds copies of all references<sup>37</sup> used in this guideline and these can be found at: [www.un.org/disarmament/un-safeguard/references](http://www.un.org/disarmament/un-safeguard/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/convarms/ammunition](http://www.un.org/disarmament/convarms/ammunition). National authorities, employers and other interested bodies and organisations should obtain copies before commencing conventional ammunition stockpile management programmes.

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<sup>37</sup> Where copyright permits.

## 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](http://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.