United Nations Manual on Ammunition Management

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DEPARTMENT OF PEACE OPERATIONS

DEPARTMENT OF OPERATIONAL SUPPORT

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PREFACE

The United Nations Manual on Ammunition Management is an essential reference for Member States, troop and police contributing countries, military commanders, police commissioners and staff officers in United Nations peace operations, including senior mission leaders and staff members at United Nations Headquarters. The manual was developed by the Department of Peace Operations and the Department of Operational Support with the support of ammunition experts from Member States and in consultation with field missions and the United Nations Mine Action Service.

Over the past 70 years United Nations peace operations have evolved significantly in their complexity. Peacekeeping missions are deployed in environments that are hostile and unstable. This means the uniformed and armed military and police personnel, as well as United Nations armed security personnel, are essential to supporting the implementation of mission mandates. Over the years, thousands of weapons and millions of rounds of ammunition have been deployed in United Nations peace operations. Stockpiling of ammunition with the absence of standardized management systems poses an unnecessary risk to the peacekeepers and surrounding communities.

In order to integrate the technical principles of ammunition management, this manual provides comprehensive control measures in the overall storage, safety and logistical aspects. It also addresses required amounts of ammunition including for training in the field missions.

This manual incorporates the International Technical Ammunition Guidelines (IATG) and standardizes good practices and approaches already developed in the field missions with a view to improving and enhancing the safety and security of ammunition in the field. This manual also addresses the need for effective remediation of firing ranges after closure to mitigate against environmental and public health impacts following site handover, in line with the then DPKO-DFS Environmental Policy for Field Missions (2009).

Our Departments wish to express our sincere gratitude to the Members States, United Nations system partners, peacekeeping practitioners in field missions and other relevant stakeholders for the dedicated support and substantial contributions to the development of this manual. We further recognize the Office of Military Affairs for spearheading the initiative and thank the contingent-owned equipment experts for providing invaluable support and guidance.

The Departments of Peace Operations and Operational Support will continue to refine and update this manual ensuring its relevance in the ever-changing operational environment. and will work with field missions to support its implementation. We are confident that implementation of the practices and procedures described in this manual will improve the capability of field missions to protect and promote the safety of peacekeepers and civilians alike.

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FOREWORD

I am pleased to introduce the United Nations Manual on Ammunition Management, a practical guide for all peacekeepers in the missions, as well as for the Member States and the United Nations Headquarters.

I would like to express my sincere gratitude to the field missions, and other peacekeeping practitioners and stakeholders for the dedicated support and substantial contribution they have provided in the development of this Manual. Specifically, I would like to acknowledge the expertise of the subject matter experts namely Lt. Col. Akm Joglur Rahman Khan, Bangladesh and Lt. Col. Bär Franz Otto, Switzerland who have been working together with the UN Secretariat Working Group.

We will continue to refine and update this Manual to ensure its relevance to the changing operational environment and to meet the aspirations of the Member States and the United Nations.

Lt. Gen. Carlos Humberto Loitey
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SCOPE

Described herein are the good practices and standard procedures of ammunition management for the Military and Police Components of peace operations, based on the IATG. This manual covers the contingent-owned ammunition for troop and police contributing countries (T/PCCs) in order to promote and strengthen the safety of ammunition stockpiles, improve storage facilities, and improve the logistical aspects of ammunition under field storage, and highlights the need for remediation of firing ranges following their closure. The manual does not cover aspects of Disarmament Demobilization Reintegration (DDR) ammunition, United Nations-Owned Equipment (UNOE), and ammunition seized and/or recovered by the force or any other mission entity which will be handled separately by the mission DDR/Explosive Ordnance Disposal (EOD) Unit/United Nations Mine Action Service (UNMAS). Weapons and ammunition management (WAM) in the DDR context is covered in the DDR handbook developed by the Department of Peace Operations (DPO) and United Nations Office of Disarmaments Affairs (UNODA)[1]. Management of seized weapons is conducted accordance with the United Nations Policy on Weapons and Ammunition Management[2].

All United Nations civilian and uniformed personnel serving in United Nations peace operations, both at United Nations Headquarters (UNHQ) in the DPO, the Department of Operational Support (DOS) and in the field missions dealing with ammunition owned by T/PCCs, i.e., Contingent-Owned Equipment (COE) must comply with this manual and adhere to its safety standards.

This manual serves as guidance for T/PCCs personnel during the pre-deployment phase, deployment and repatriation in peace operations. This manual supersedes the 2002 edition of the DPKO-DFS Guidelines on Levels of Ammunition.

This manual is subdivided into five chapters:

Chapter 1: Standards of Ammunition Storage in United Nations Peace Operations The chapter is designed to provide common standards for the storage of ammunition and general safety norms and practices based on international regulations and guidance to minimize the risk posed by stockpiles of ammunition. It provides the basic specifications for the ammunition container as required by the United Nations. The IATG are used as a basis for guidance provided herein and are cited throughout accordingly. The latest version of the IATG can be accessed at https://www.un.org/disarmament/un-saferguard/references/

Chapter 2: Levels of Operational Ammunition This chapter provides guidance to T/PCCs prior to initial deployment regarding the minimum and maximum levels of ammunition per weapon/person and type, based on the operational and logistic requirements for each type of unit in a specific peace operation.

[1] Effective Weapons and Ammunition Management in a changing Disarmament, Demobilization and Reintegration (DDR)Context, Handbook for United Nations DDR practitioners (https://www.un.org/disarmament/publications/more/ddr-handbook/)
[2] United Nations Weapons and Ammunition Management Policy, January 2019.

Chapter 3: Shelf Life of Ammunition The chapter prescribes the recommended shelf life of ammunition based on storage/climatic conditions and an upper age limit of ammunition to be deployed in the mission area.

Chapter 4: Expiration, Replenishment and Disposal. The chapter provides procedures to be taken after ammunition expiration. This chapter also describes a process to replenish and dispose of expired ammunition.

Chapter 5: Serviceability Checks and Training for Small Arms Training This chapter sets for the requirement and standards for weapons firing training T/PCCs should also use to confirm the serviceability of weapons. Although training ammunition is a national responsibility, this chapter offers guidelines to regulate the scales and standardizes the ammunition stockpile in the mission which affects its safety and storage.

This manual does not address all situations, nor does it provide the answers to all issues that may arise. In such circumstances where the answer is not provided, consultation should be made to the Weapons and Ammunition Advisory Board (WAAB) in the field missions. Issues that could apply globally for all missions should be raised to the UNHQ COE/MOU Management Review Board (CMMRB) through the Field CMMRB.

This manual uses the words “shall,” “must”, “should” and “may/can” to express provisions in accordance with their usage in International Organization for Standardization (ISO) standards:

Shall/Must: indicates a requirement. It is used to indicate requirements strictly to be followed.

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 not necessarily recommended but not prohibited.

May: indicates permission. It is used to indicate a course of action permissible within the limits of the document.

Can: is used for statements indicating possibility and capability, whether material, physical or causal.

DEVIATIONS

In mission deviations from this manual should be addressed through the Mission Weapons and Ammunition Advisory Board (WAAB). Specialists (for example firefighting, ammunition safety, security, transport) are to be consulted and asked to highlight any possible consequence of any requested exception. Any advice provided by the WAAB to the Operational Commander must be documented and properly recorded.

Where these guidelines cannot be met, a consequence and/or risk assessment must be conducted before approving an exception to these guidelines. This assessment is a systematic procedure that determines if an acceptable level of protection is provided. Acceptance of risk must be made only after a considered judgment is made weighing the risk, risk mitigation control measures and operational effectiveness. Any request for deviation must be approved by the mission leadership, or delegated authority.

DISCLAIMER

Adherence to these guidelines should provide an acceptable level of safety regarding ammunition operations. The guidelines do not ensure or guarantee an absence of risk; nor can these guidelines address every possible situation.

CHAPTER 1

Standards of Ammunition Storage in United Nations Peace Operations

1.1 Introduction

1.1.1 United Nations peace operations (UNPOs) usually receive mandates lasting one year or less from the Security Council, and budgets from the General Assembly. Even though mandates are normally extended, the legal status and financial implications have a direct impact on the type of facilities and operational requirements for deployed ammunition. The unstable nature of UNPO also imposes the requirement for mobility and flexibility for operational deployment of the military and police units. For this reason, in the context of United Nations field missions, storage of ammunition and explosives shall be required to conform with guidance provided in International Ammunition Technical Guidelines (IATG) 04.20 for Temporary Storage. The IATG 04.20 describes most of the specific requirements in UNPO, but unless specifically stated within IATG 04.20, the requirements of all other IATG modules shall be observed in order to retain the most stringent safety standards and preservation of assets during temporary storage conditions. Temporary ammunition storage during patrolling is not covered in this manual, pending development of standards. Missions must develop these standards in the meantime.

1.1.2 UNPOs have particularities that drive their logistic planning and support concept. One of these details is the division of responsibilities between the United Nations and T/PCCs for ammunition storage. The most common approach is that each T/PCC will be responsible for controlling and managing their own ammunition storage facilities. In accordance with the COE Manual, contingents that are responsible for minor engineering capabilities under the self-sustainment category should provide the fortification plan and work in close coordination with the United Nations on the construction of ammunition storage fortification. Occasionally, due to logistic or safety reasons, ammunition might be centralized under a single deposit and have shared management. When this occurs, field missions will have to draft specific Standard Operational Procedures based on this manual and adhere to the IATG 04.20 specifications.

1.1.3 The standard ammunition storage facility in United Nations field missions is the ammunition container as specified in Annex A of this manual, as well as in the COE Manual. Other types of storage facilities, although not recommended, have been used based on the mission's and T/PCCs' requirements, though they must still adhere to IATG. Substandard storage facilities substantially affect the shelf life of ammunition and pose a threat to persons and material in the surrounding area. Containers used as temporary storage shall be barricaded in accordance with IATG 04.20 and include overhead protection (OHP) as appropriate or when necessary, based on the risk assessment.

1.1.4 This chapter outlines the principles that T/PCCs and field missions should use to properly integrate ammunition safety guidelines into UNPO. The critical ammunition safety elements will be identified. Meeting those elements will provide field missions with the ability to conduct operations and manage ammunition storage areas involving various T/PCCs in a safe and secure manner.

1.2 Critical Ammunition Safety Elements Under the United Nations Peace Operations

1.2.1 Weapons and Ammunition Advisory Board (WAAB)

The field mission shall establish a WAAB as stipulated in the DPPA/DPO/DOS/DSS Policy on Weapons and Ammunition Management. The WAAB shall be responsible for advising the Mission's Senior Management Team on all aspects of weapons and ammunition management (WAM). The WAAB forms a framework for managing all ammunition-related elements. The WAAB provides a platform to address issues and concerns and ensures that critical ammunition safety matters are addressed. The frequency of board meetings is dependent on the operational tempo but should occur no less than once per month. Minutes of the meetings should be recorded and distributed to the mission senior management team and WAAB members. Specialists from other related fields such as engineering, medical and United Nations Department of Safety and Security (UNDSS) may be invited to advise the board. Recommendations of the WAAB requiring action by a T/PCC will be raised to the mission COE/MOU Management Review Board (CMMRB) for elevation to UNHQ. The WAAB shall be composed of the following:

- **Mission Chief of Staff or an equivalent level senior official:** Chair of the Board.
- **Head of Military and Police Components, or designated representative.**
- **Senior Ammunition Technical Officer (SATO):** The SATO in field missions will serve as the principal ammunition safety advisor for the T/PCCs and will act as the WAAB Manager.
- **Other Explosives and Weapons Specialists**: If any explosives and weapons experts are available in the mission they shall also act as members of the board (for example UNMAS experts).
- **Unit Points of Contact** The senior T/PCC representative in the field missions shall nominate points of contact, in connection with ammunition, and maintain a technical network of contacts and provide contact details to the SATO.
- **Mission Support COE Unit:** The COE unit is responsible for checking if the T/PCC has conducted all works under its responsibility related to the storage facilities. The unit shall also organize verification of the ammunition levels of each T/PCC through the SATO.
- **Mission Support Engineering Section:** The Engineering Section should provide engineering support for camp construction and include the camp security module as suggested by WAAB in the overall camp layout.
- **UNDSS:** UNDSS should provide technical support in connection with fire safety and security of Ammunition Storage.
- **Medical Service:** The medical service should provide advice on availability of immediate medical support in case of an accident associated with Ammunition Storage.

1.2.2 Roles and Responsibilities of the WAAB

1.2.2.1 Chair of the Board

- Attend Field CMMRB meetings and apprise the mission's Senior Management Team about the overall state of ammunition in the mission area.
- Adopt the SATO risk assessment regarding ammunition storage as a base requirement for ammunition management in the mission.
- Include the DSS Security Risk Assessment (SRA) in all considerations, related to ammunition storage. For example, a requirement for overhead protection (OHP) for ammunition stores in certain regions or removal of the visible fire divisions to avoid specific targeting of high explosives.
- Advise the mission's Senior Management Team on the location of ammunition storage, including safety requirements for incoming mission contingents.
- Advise the mission's Senior Management Team about the general applicability and use of IATG 04.20 instead of the normal IATG 02.20 quantity distances, when necessary.
- Apprise the mission's Senior Management Team about the deviations from any safety requirement in connection with ammunition storage in the mission area including risk mitigation measures.
- Advise the mission's Senior Management Team about any requirement for central storage or management of ammunition in the mission area.
- Provide comments on all Ammunition Accident Investigation Reports.
- Coordinate with all stake holders on all ammunition security and safety issues.
- Advise the mission's Senior Management Team to request that UNHQ take up the issue of expired T/PCC ammunition shelf life with the respective Permanent Mission.
- Advise the mission's Senior Management Team about the requirements and necessary actions for soil remediation of mission firing ranges after their closure

1.2.2.2 WAAB Manager

- Arrange board meetings once every month.
- Record the minutes of the board meetings and distribute the same to all mission senior management team and WAAB members.
- Advise the WAAB Chair on all matters concerning ammunition, especially its storage and safety.
- Appraise the WAAB Chair on any T/PCC deviation from the SATO recommendations during inspection.
- Appraise the WAAB Chair on the overall deviation from standards in the ammunition storage, and mitigation measures.
- Coordinate all security and safety issues in connection with ammunition with all stake holders.
- Support the WAAB Chair by ensuring implementation of WAAB/SATO safety recommendations concerning ammunition and surrounding areas.
- Prepare the necessary data/information/presentations for the WAAB Chair prior to attending the PMM and CMMRB.
- Provide expert opinion for all ammunition accident investigations.
- Check T/PCC ammunition shelf life expiration and follow up to ensure timely replenishment. Keep the WAAB Chair updated.

1.2.2.3 Board Member

- Attend monthly (or as and when required) meetings of the board.
- Provide input and recommendations regarding ammunition.

1.3 Ammunition Storage Containers

1.3.1 An ammunition storage container is the standard and preferred location where all ammunition should be kept during deployment in United Nations field missions. It shall be the T/PCC's responsibility to deploy the required quantity of ammunition containers, based on the Statement of Unit Requirements (SUR) and the Memorandum of Understanding (MOU). The number of containers will be based on the unit's concept of employment and the types and quantities of ammunition required for the deployment (Chapter 2 of this manual will provide more information on the levels of operational ammunition), taking into account the mixing rules and Net Explosive Quantity (NEQ) limits. Due to the temporary nature of any UN mission, it is not always feasible to construct purpose-built ammunition storage buildings. Therefore, a container which is up to 20ft long with standardized modification to hold ammunition is the recommended location for primary storage of ammunition and explosives. The specifications can be found in Annex A.

1.3.2 An unbarricaded ammunition container is considered as a light/open stack structure. Overpressure and primary fragmentation protection are low or non-existant. As a potential explosive site (PES) and depending on the Net Explosive Quantity (NEQ) Hazard Division (HD) 1.1 stored, the container can disintegrate and produce debris with damage potential. Therefore, all ammunition containers deployed in the field must be appropriately barricaded according to Barricades (Level 2), IATG 4.20.

1.3.3 The construction of ammunition storage shades[3] under temporary storage conditions (IATG 04.20 Clause 8) falls under minor engineering capability of T/PCCs. The responsibility for ammunition storage is with the T/PCCs as per the COE Manual. More complex ammunition storage using temporary storage conditions, especially when overhead protection may be used, may exceed minor engineering capabilities and may have to be constructed with support from mission engineers. The field defense stores (FDS) required for the security of the ammunition storage area will be provided by the United Nations when the United Nations takes the self-sustainment responsibility for FDS in accordance with the MOU.

1.4 Temporary Ammunition Storage Site

Based on IATG 04.20 classification of temporary ammunition storage area components, and on the realities of the United Nations field missions, it is very unlikely that T/PCCs will have more than one Temporary Ammunition Storage Site. In many cases, military/police camps will have not more than one Temporary Ammunition Store (one 20' ammunition container) at each camp site. The number of ammunition containers at each camp site shall be suggested during the military planning process and based on the type and quantity of ammunition a T/PCC is required to deploy. A final decision on the required number of ammunition containers depends on the results of the licensing process, based on the actual distances to Exposed Sites (ES) (structures) at the camp site.

[3] Light shades over the storage containers for the protection of ammunition stocks in Temporary Storage Areas from climatic conditions through direct sunlight.

1.5 Location of Ammunition Storage Area

United Nations field missions shall adhere to the requirements stated in IATG 04.20 for the location of the ammunition storage sites within the military and police units' main bases. The WAAB of each field mission shall advise the T/PCCs during base construction on the most suitable location for ammunition storage. If the WAAB is not yet formed the SATO, UNMAS and UNDSS will advise the Engineering Section on ammunition storage site location. The existing concept and technical specifications for Camp Layout, developed by the United Nations Global Service Centre/Engineering Standardization and Design Center, shall be followed. The proper location of an ammunition storage site shall be decided according to the requirements and existing resources. Whenever large amounts of ammunition with HD 1.1 must be stored, a common and centralized ammunition storage site with greater distance to accommodation sites should be considered. The GPS coordinates of the ammunition storage areas should be shared with the Mission Support Environment Section to allow the management of an updated mission-wide mapping of all hazardous sites.

1.6 Ammunition Management

Ammunition storage management remains a T/PCC responsibility. IATG 4.20 shall be followed for the implementation of temporary storage, ammunition processing and explosive safety. Military and police contingent commanders shall be responsible for maintaining ammunition records according to IATG 03.10 and 03.20, and at any given time shall have information available on the physical location of each ammunition type. Any loss of ammunition shall be recorded and reported in accordance to the United Nations SOP on Loss of Weapons and Ammunition 2009. T/PCCs shall certify that all ammunition deployed in support of national contingents is 'safe and suitable for service' and is subject to a surveillance and proof program fully in compliance with the requirements of IATG 07.20, Surveillance and Proof. The proof and surveillance compliance form of IATG 04.20, Annex C, shall be completed and distributed as indicated on the form.

While national templates may be used by T/PCCs, the United Nations ammunition registry at FHQ/PHQ level shall contain, at the minimum, the following data:

Ammunition:

- Associated Ammunition Category (Hazard Classification Code and Fire Division);
- United Nations number (provided by the United Nations Committee of Experts on the Transport of Dangerous Goods);
- Type;
- Caliber;
- LOT and batch number;
- Shelf life (end date) of each LOT/batch (in the absence of the manufacturer's expiry date, T/PCCs shall provide the certification;
- Number of each type;
- Location;
- Purpose of Ammunition;

- Date and time of last (national) inspection before shipment;
- Date and time of production.

1.6.1 Ammunition Requiring Separate Storage

In addition to the mixing rules, certain types of conventional ammunition should always be stored in separate PES, (or under specific conditions), from other types of ammunition:

- **White Phosphorous (WP)**. This manual does not authorize T/PCCs to hold WP ammunition except munitions which may have minimal incendiary effects, such as illumination, tracers, smoke or signaling systems within caliber of small arms (within 26,5mm).
  For seized/recovered WP ammunition, the PES for this ammunition shall be very near to a source of water or a water container large enough to fully fit the largest ammunition container should be on the site. The WP ammunition should be stored in an upright position with the base nearest the ground;
- **Missiles in a Propulsive State**. These should be stored in a barricaded PES with the warheads pointing away from other ammunition stocks;
- **Damaged Ammunition**. If considered unsafe for storage by a qualified assessment, damaged munitions should be destroyed at the earliest convenience;
- **Ammunition awaiting destruction or demilitarization** and,
- **Ammunition that has deteriorated and become hazardous**. This shall be stored in isolation and destroyed at the earliest convenience.
- **Expired Ammunition.** See Chapter 4.

1.7 Physical Protection and Security

All ammunition storage areas or sites shall have the minimum measures for physical protection and security against fire, natural disasters and unauthorized entry. These plans should follow T/PCCs' national standards, but also IATG 09.10 technical specifications and UNDSS rules and regulations. All military and police units shall provide a fire safety plan, entrance control plan and contingency plan in case of natural disaster affecting the ammunition storage site. This plan shall be validated by the contingent commander, SATO and UNDSS officer. Perimeter security should be the highest priority, and this may be achieved by using a combination of armed guards, patrols and fencing/barricading.

1.7.1 Development of Physical Security Systems

The following components should be examined and considered during the development of a physical security system:

The Physical Security System shall protect the assets and facilities against theft, sabotage and other malevolent human acts. The Physical Security System shall be effective and consider the Design Basis Threat. The Design Basis Threat is the result of:

- A characterization of the facility. Include the special conditions of its location, e.g., whether it is in a desert or in a jungle.
- A threat assessment: Are you confronted with a regular armed group or quick response and light armored groups?
- Ammunition storage considerations. Man Portable Air Defense System (MANPADS) are stored differently than 90 mm guns or Surplus Ammo & Arms (SAA).

The design of the Physical Security System should follow the following:

- Ability to detect the identified threat.
- Ability to delay the identified threat.
- Ability to respond to the identified threat

During operations, security personnel must ensure the following physical security components are considered:

- Key management;
- Security regulations and standard operating procedures (SOP);
- Risk assessment;
- Security plan;
- Staff selection and vetting;
- Access control;
- Physical security of structures; and,
- Physical security of perimeter;
- Ignition Sources Control (lighters, matches, cigarettes, etc;).

1.8 Fire Protection

Fire is a major threat to ammunition storage sites. **Protection against fire involves three important principles:**

- Prevention.
- Hazard identification.
- Firefighting capability and readiness.

The contingent commander, along with the designated specialists (i.e., SATO, UNMAS and UNDSS/Fire Protection Focal Point), is responsible for producing the necessary fire protection plans. Responsibilities and organization of the Fire and Emergency Plan (FEP) are shown at Annex B.

1.8.1 Prevention

Fire prevention plans shall be included in the unit SOP. Fire prevention measures are to be organized considering the following:

- Order and cleanliness, as well as strict observance of safety precautions. These include, the most effective fire prevention measures prohibition of smoking and the use of open flames, fire and bare lights and other unauthorized articles;
- Handling of flammable substances;

- Prevention of the accumulation of additional fire hazards such as stacking materials, packaging materials, etc;
- Fire hazards associated with machines, equipment and tools used during ammunition operations or the overloading of electrical systems;
- The use of oil or gas-filled lighting, heating or burning appliances and all flame, spark or fire producing appliances should be minimized;
- Removal flammable undergrowth and laying out fire lanes;
- Clearing zones around PES, trimming of trees/branches/bushes/grass, etc., (radius 20 m).

References IATG can be found under IATG 02.50 and 04.20 clause 10.

1.8.2 Hazard Identification

1.8.2.1 In order to promote the safe transport and storage of ammunition, the United Nations hazard classification code (HCC) and fire divisions shall be used during storage and transportation for a simplified consequential hazard and risk assessment (see IATG 01.10, United Nations explosive hazard classification system and codes). The HCC for an explosive or type of ammunition consists of a combination of six hazard categories and fire divisions including:

- its Hazard Division; and,
- its Compatibility Group[4]

1.8.2.2 The four fire divisions, should be indicated during storage and transportation by one of four distinctive symbols in order to be recognized by the fire-fighting personnel approaching the fire scene. The four different Fire Division symbols are shown below. The number and shape of each symbol serves to identify its fire hazard for firefighting personnel approaching a possible fire. Each PES shall be marked on the outside of the storage facility according to figure 1.1:

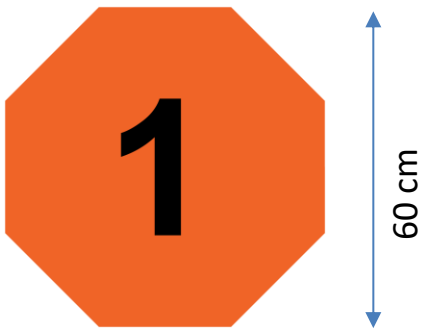
- Fire Division 1 - Mass explosion
- Fire Division 2 - Explosion with fragment hazard
- Fire Division 3 - Mass fire
- Fire Division 4 - Moderate fire

[4]**Compatibility Group** is grouping identified by a letter which, when referenced to a compatibility table, shows those **explosives** which may be stored or transported together without significantly increasing the probability of an **accident** or, for a given quantity, the magnitude of the effects of such an accident. Codes are used to indicate which **natures** may be safely stored together. Full categorization and descriptions are found in the IATG 01.50

Hazard Division	Fire Division Symbol	Remarks
1.1		▪
1.2		▪
1.3		▪
1.4		▪
1.5		▪ Fire Division 1 symbol used due to similar fire-fighting hazards.
1.6		▪ Fire Division 2 symbol used due to similar fire-fighting hazards.

Figure 1.1: Fire Division Symbols

Examples:

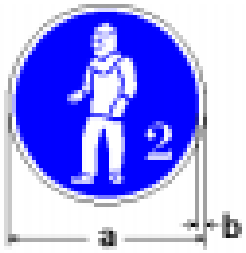


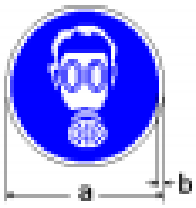
1.1 F = FD **1**– rocket propelled grenades

or

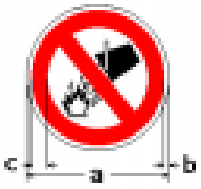
1.4 S = FD **4** – small arms ammunition

Supplementary symbols should be used to identify which containers and locations contain specific types of pyrotechnic material as these munitions pose supplementary hazards. The SATO should advise the fire protection officer (FPO) of any supplementary hazards and the specific emergency measures for such ammunition. Supplementary symbols shown below can be displayed at a PES to indicate the following precautions that must be taken when fighting fires:

- Wear full protective suit.
  - 

- Wear respirator face piece.
  - 

- Apply no water.



The Hazard Division for a particular explosive or type of ammunition describes the specific danger from the ammunition,

Hazard Division	Description	Pictogram[9]	Signal Word	Hazard Statement
1.1	Ammunition that has a mass explosion hazard.		▪ **Danger**	▪ Mass explosion hazard.
1.2	Ammunition that has a projection hazard but not a mass explosion hazard.		▪ **Danger**	▪ Severe projection hazard.
1.2.1	Ammunition that has a projection hazard but not a mass explosion hazard. (More hazardous items of HD 1.2, which give large fragments over an extended range).		▪ **Danger**	▪
1.2.2	Ammunition that has a projection hazard but not a mass explosion hazard. (The less hazardous items of HD 1.2, which give smaller fragments of limited range).		▪ **Danger**	▪
1.2.3	Ammunition that exhibit at most an explosion reaction during sympathetic reaction testing and a burning reaction in bullet impact and heating tests.[10]		▪ **Danger**	▪
1.3	Ammunition that has a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard.		▪ **Danger**	▪ Fire, blast or projection hazard.
1.3.1	Ammunition that has a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard. (The more hazardous items with mass fire hazard and considerable thermal radiation).		▪ **Danger**	▪
1.3.2	Ammunition that has a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard. (The less hazardous items that burn sporadically).		▪ **Danger**	▪

1.4	Ammunition that presents no significant hazard.		▪ **Warning**	▪ Fire or projection hazard.
1.5	Very insensitive substances, which have a mass explosion hazard.		▪ **Danger**	▪ May mass explode in fire.
1.6	Extremely insensitive articles which do not have a mass explosion hazard.		▪ *No Signal Word*	▪ *No hazard statement.*
Unstable Explosive	Any explosive in an unstable condition.	*No pictogram assigned as the transport of unstable explosive is not permitted.*	▪ **Danger**	▪ Unstable explosive.

Figure 1.2: Hazard Division Symbols

The * (star) is a placeholder for the compatibility group code

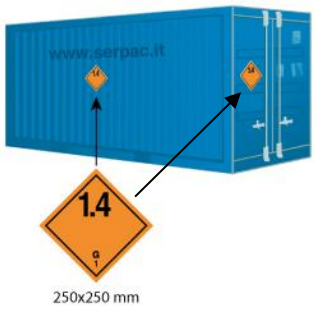
For example:

1.1 F – rocket propelled grenades or

1.4 S – small arms ammunition

Placards are to be placed on the container front, sides and storage facility entrance.

The placard shall be in the form of a square set at an angle of 45° (diamond-shaped). The minimum dimensions shall be **250 mm x 250 mm** (to the edge of the placard).



1.9 Electro-Magnetic (EM) Radiation Protection (IATG 05.60)

Transmitting devices (cellular phones, pagers, vehicle transmitters, etc.) must not be used within 20m from any PES unless specifically authorized. Use of transmitters within the ammunition storage area must be reviewed on a case-by-case basis and a license to operate such equipment at a specified safe distance should be provided by the National Technical Authority and approved by the SATO. Signs warning of cellphone and radio use prohibition should be posted at a safe distance from the storage.

1.10 Weather Protection

1.10.1 Environmental Conditions

- **Temperature**
  High temperatures (>30 degree C), and large variations in temperatures can degrade the performance and safety of a variety of ammunition, in particular those containing propellants (as described in Chapter 3). Every effort should be made to reduce this effect, using covered storage, correct stacking procedures for provision of adequate ventilation and, if possible, the use of an air-conditioned environment (specifications of the ammunition container are at Annex A). A light paint color on the container may significantly reduce the temperature inside the container.

- **Humidity**
  The effects of moisture at higher temperatures are worse than the effects of moisture at low temperatures. The increased effects resulting from high moisture and high temperature can lead to failure of ignition systems, reduction in propellant efficiency, and degradation of various munitions fills. Alternatively, low humidity environments can result in an increased risk from electrostatic discharge (ESD) hazards and may also dry out critical seals and other components.

- **Environmental Controls**
  Every effort shall be made to reduce the effects of high temperatures and moisture on explosives held by units and in the ammunition storage areas. All excess vegetation and combustible material shall be removed from the storage sites within a radius of 20m of such sites when munitions are present. Ammunition shall not be located immediately adjacent to reservoirs or sewers.

- **Storage on the Ground**
  Ammunition should not to be stored directly on the ground except in tactical use, but should be placed on pallets that provide a minimum of 75 mm clear distance from the ground to ensure ventilation.

- **Lightning Protection**
  In order to mitigate the adverse effects of a lightning strike (accidental ignition, damage), all PES should be provided with lightning protection. Ammunition containers used to store ammunition are to be considered a "Faraday cage" thereby not requiring additional lightning protection. However, they must be effectively grounded (also for ESD threats - see IATG 05.40, clause 8 and specifically 8.1.3.e for details).

1.11 Electrical Safety

In field missions, many T/PCCs are co-located, and each may use different electrical standards. This could present problems regarding electrical safety. All electrical installations inside and on ammunition storage containers must adhere to IATG 05.40, safety standards for electrical installation.

1.12 Desirable Safety Distances

1.12.1 Acquisition of land for a T/PCC to establish its operational base is a United Nations responsibility. Land acquisition will be affected by the host nation's consent and real estate availability. Quite commonly, ideal distances according to IATG 02.20 from ammunition storage areas/sites to other facilities will not be achievable within a United Nations base or even within the local population. However, quantity distance (QD) in accordance with IATG 02.20 should be used whenever possible and temporary distance (TD), as indicated in IATG 04.20, can be considered upon authorization of the WAAB. In such cases where TD are used and higher risks for mission personal are accepted, mitigating measures beyond the ones already existing in the camp layouts, developed by the United Nations Global Service Centre/Engineering Standardization and Design Center, will have to be proposed by SATO and the Engineering Section to safeguard United Nations personnel and facilities and the civilian population living near UN camps. Safety distances will follow the rules laid out in the IATG and should be a WAAB responsibility to know and apply.

1.12.2 Temporary storage conditions in the missions permit the use of reduced quantity distance, as explained in IATG 04.20 clause 7.4.1. Temporary storage conditions increase the risk to the mission and United Nations staff deployed inside the camp, but not to the civilian population living outside, as the external quantity distances are not reduced. The reduced quantity distances shall not be used as a justification for limited or reduced resource allocation for stockpile management. However, if these reduced quantity distances are not achievable in an exceptional and urgent case needed to fulfill the mission, then an Explosive Safety Case shall be compiled in accordance with IATG 02.10, clause 13.4.

1.12.3 Explosive limits depend directly on the available distances between the PES and ES. There are two options for authorizing the explosive limits in NEQ at a PES regardless of the type of Explosive Limit Licenses (ELL) as explained in IATG 2.30 clause 7.1:

- The Site Potential Limit. This is the potential theoretical NEQ, by HD, which is achievable at a PES after calculating the QDs to the various ES and;
- The Authorized Limit. This is the actual limit, authorized by the appropriate technical authority, and reflects the maximum quantity of explosives, by HD, that is permitted at that PES.

In order to reduce explosive risk to a minimum, the PES should be licensed to an Authorized Limit,

unless flexibility in storage is required over the short term. Over the long term, a PES could always be re-licensed to a higher authorized limit if necessary.

Reference: IATG 2.30 clause 7.1
IATG 02.10, clause 13.4.

1.13 Barricades

The proper use of barricades can decrease the damaging magnitude of a detonation event and increase the ammunition storage capacity in limited areas. A barricade at a PES may stop low angle high velocity fragments, which are the primary mechanism for prompt detonation propagation, but barricades don't effectively reduce the effect of overpressure. They also may protect the PES from a threat. The barricade should be thick enough and the material must have enough penetration resistance to stop primary low angle high-velocity fragments. The barricade must be stable over time and should not be susceptible to environmental factors. The fill material of a barricade should not be hazardous to personnel or other ammunition modules when it is launched by an explosion. The preferred type of fill material should be free of organic and hazardous materials (See IATG 4.20 for types and configuration of barricades).

1.14 Accident Report and Investigation

All reports and investigations concerning accidents or incidents involving ammunition and explosives shall follow UNDSS guidelines and procedures. Ammunition specialists shall be asked to support the work of any Board of Inquiry as found appropriate by mission leadership. The following information is provided as a guide for the initial report:

- the name of individual submitting the report;
- the using unit;
- using unit contact person;
- the date and time of accident involving explosives;
- probable cause, if known;
- details regarding fatalities, injuries and damage and their location indicated on a map;
- location where the accident involving explosives occurred, including map grid reference;
- type and quantity (NEQ) of munitions involved (full technical name);
- weapon type involved (full technical name);
- batch, lot and/or serial number of the munitions involved;
- shelf life of the ammunition involved;
- description of the accident and type of activity (e.g., loading, transport);
- weather conditions;
- action (s) taken by the using unit.

Reference: IATG 11.10 and 11.20

1.15 Inspection and Evaluation

1.15.1 Introduction

Since ammunition contains high energy material and is designed to be as lethal as possible, it is highly desired that it is safe, reliable and effective during operation, transportation and handling. Therefore, inspections and evaluations shall be carried out to ensure that ammunition policy/guidelines are adhered to by units. Evaluation and recommendations shall be done to improve the standard of ammunition management in units.

1.15.2 Types of Inspection by SATO

1.15.2.1 The SATO shall carry out the following types of inspection in the units:

- Annual Routine Inspection as per a circulated program;
- The SATO or another ATO shall accompany the COE team to the Operational Readiness Inspection for each unit;
- An inspection carried out on units upon arrival and repatriation;
- Any other inspection as appeared/requested by the concerned unit;
- The SATO shall have the authority to conduct impromptu inspections at any time.
- The SATO may be unable to attend all inspections for all T/PCCs. Each unit shall be inspected at a minimum of once a year.

1.15.2.2 An internal inspection shall be carried out by the T/PCC person in charge of ammunition storage (or a nominated and qualified representative), normally from the military/police unit occupying the camp, to ensure that:

- There is a continuous recording/logging and monitoring regime to ascertain the condition of each PES, the stockpile contained within and the overall ammunition storage area;
- There is a PES log book with temperature and humidity records;
- The firefighting equipment is working, and drills are conducted;
- The security alarm is working.

The results of the inspection shall be recorded on an inspection record sheet. A copy of these inspection records shall be sent to the SATO.

1.15.3 Inspection Criteria/Evaluation System

IATG 06.70 will be adhered to during inspection for consultation. A standard Inspection Criteria/Evaluation Template is attached to this manual at Annex C.

1.15.4 Responsibility of Inspection and Evaluation

The SATO or his/her appropriate representative is authorized to carry out inspection of ammunition and evaluation of units as per this manual. Details regarding the competency and responsibility of SATO are given at Annex D.

1.15.5 Concurrence of Inspection & Evaluation Report

After the inspection is carried out, the SATO shall furnish an inspection and evaluation report on the ammunition storage conditions of the concerned unit. The reports shall be shared with all members of the WAAB and approved during the next WAAB meeting. The chair of the WAAB shall be informed without delay when the minimum standards cannot be met. Copies of the approved report shall be disseminated to all concerned for appropriate action.

CHAPTER 2

Levels of Operational Ammunition

2.1 Introduction

This section of the manual provides guidance on the levels of operational ammunition, bringing uniformity to the levels of ammunition in field missions. This standardization will ensure similar storage facilities and management standards, improving the ability of the ATO Cell/COE Unit in field missions to evaluate the status of ammunition and storage facilities. This includes minimum and maximum levels of ammunition to be deployed in the mission area by T/PCCs.

2.2 Factors Considered

The level of operational ammunition required in UNPOs depends upon several factors including: the mandate; the mission; the threat; the tempo of likely operations; the results and assessment of the mission technical survey; the strength, organization, concept of maneuver, method of operation and tactics of T/PCC units; the safety level of supplies; the replenishment lead times (considered during planning and for replenishment/requisitioning approvals) and the order and shipping time (national supply, response time, distance, mode of transport, in-mission receipt, customs clearance and internal in mission movement).

2.3 Guiding Documents

2.3.1 T/PCC Guiding Documents

The T/PCCs have their national doctrine that describe required stockage of operational ammunition as basic a load/first line for all weapons. National standards shall not be standard documents to calculate uniform scale for United Nations field missions.

2.3.2 United Nations Guiding Documents

The current COE Manual (the last applicable) provides information on the transportation and reimbursement costs for ammunition used during training, special training beyond accepted United Nations readiness standards and operations, as well as guidance on ammunition that becomes unserviceable while in the mission area.

2.4 Calculation of Levels of Operational Ammunition

2.4.1 Calculation of the levels of operational ammunition shall be done by DPO considering the mission mandate, the threat within the mission and tempo of likely operations. Safety levels of affect the quantity and types of operational ammunition required in the mission and are described in this manual.

Depending on the likelihood of troops engaging or being engaged (consuming ammunition), three levels of "likelihood of consumption of ammunition" are defined: LOW, MEDIUM and HIGH[5]. These levels are based on two benchmarks included in the hostile action or forced abandonment factor,[6] as per the following calculation process. They describe the complete stockpile to be stored:

3B: Potential for hostile engagement of the United Nations forces by identified factions or combatants participating in the peace process.

3D: Potential for hostile engagement of the United Nations forces by unidentified factions or by individuals or groups other than participants in the peace process.

X^7 = Sum (3B+3D).

If X < 10: Level is LOW.

If X >=10 but < 20: Level is MEDIUM.

If X >= 20: Level is HIGH.

For each level of "likelihood of consumption of ammunition" there is a corresponding level of ammunition to be deployed (LOW/MEDIUM/HIGH). These levels shall be communicated to T/PCCs during MOU negotiations.

Replenishment of ammunition will be triggered when the levels of stocks have reached 50% for any one type of ammunition.

2.4.2 Guidelines on the levels and types of ammunition that meet field mission requirements are:

2.4.2.1 The Calculation of Ammunition for Infantry/Infantry Type Weapons is shown at Annex E.
2.4.2.2 The Calculation of Ammunition for Armor Weapons is shown at Annex F.
2.4.2.3 The Calculation of Ammunition for Artillery Weapons is shown at Annex G.
2.4.2.4 The Calculation of Ammunition for Aviation/Aircraft is shown at Annex H.
2.4.2.5 Calculation of Ammunition for EOD is shown at Annex I.
2.4.2.6 The Calculation of Ammunition for UNPOL International Civilians (FPUs / Individual Police) is shown at Annex J.

2.5 Mission-Specific Requirements for Operational Ammunition

2.5.1 Necessity of Determining Mission-Specific Requirements

Mission-specific guidelines shall detail the ammunition stock levels in terms of days of supply, which T/PCC missions translate into the holdings of specific types of ammunition. It is to be noted that the mission mandate, the threat within the mission, the tempo of likely operations and safety levels of supply affect the quantity and types of operational ammunition required in the mission.

[5] During MOU negotiations, OMA/PD will provide the TCC/PCC with the classification of the mission in which the unit is to be deployed. For missions that do not have Mission Factors defined, the level will be determined by OMA/PD on a case by case basis. OMA/PD will guarantee that the levels of the different missions are aligned with the current mission factors (revised on a 3-years basis).

[6] The hostile action or forced abandonment factor is part of the Mission Factors as defined in the Manual on Policies and Procedures concerning the Reimbursement and Control of Contingent-Owned Equipment of Troop/Police Contributors Participating in Peacekeeping Missions (2017).

[7] To be defined for each mission.

2.5.2 Including the Logistic Planning, Movement and Transport Staffs

The ATO Cell, COE Unit, Mission Support Centre, Chief Military/Police Operations Officer, Movement Control Section, Engineering Section and Transport Section should all be included when developing mission-specific guidelines.

2.6 Confirmation of the Type and Level of Ammunition During the Pre-deployment Visit (PDV)

Prior to deployment and based on this manual, T/PCCs must provide the list of ammunition planned for deployment, along with the date of manufacture, the remaining shelf life, hazard division, compatibility group and the United Nations number. The Force Generation Service (FGS)/OMA/DPO and the Police Division/DPO, as applicable, will verify the ammunition list and share with the MCS/LD/DOS for verification against the load list. Appropriate types, remaining shelf life and levels of ammunition for specific types of military/police contingents must be confirmed during the Pre-Deployment Visit (PDV) to avoid unnecessary holdings and the subsequent disposal of ammunition. The SUR should include instructions regarding ammunition for T/PCCs by referring to this manual. T/PCCs should provide the list of ammunition required during the MOU negotiation process for review by OMA/PD and DOS.

CHAPTER 3

Shelf Life of Ammunition

3.1 Introduction

Ammunition shelf life is the manufacturer's recommended maximum time that ammunition can be stored, and during which the defined quality remains acceptable under expected (or specified) conditions of storage. Ammunition shelf life depends on the degradation mechanism and can be influenced by several factors which include physical, climatic and chemical conditions. This chapter describes the conditions that contribute to ammunition degradation, reduction of shelf life depending on temperature, surveillance and in-service proof (the testing for the degradation of the stabilizer in double or triple based propellants, giving test results through field-test kits on the stability and safety of the ammunition). The chapter also sets the upper age limit of ammunition to be deployed in UNPO.

3.2 Purpose of Determining Shelf Life

Ammunition contains high energy material and is designed to be as lethal as possible during its use. It is also designed to be as safe as any other equipment during its transportation, handling and operation. Ammunition has an assigned shelf life which depends on its design, the chemistry of the propellants/explosives used and is prone to deterioration/ decomposition even under normal storage conditions. The quality of ammunition deteriorates with age due to environmental factors, including changes in safety, reliability and effectiveness. Accordingly, ammunition has an assigned shelf life, defined as the life of its subsystem with the lowest shelf life under normal conditions of storage. However, the operational exposure of ammunition varies, hence functional life may be different. It is imperative for mission leadership to understand the shelf life of ammunition in their camps to allow for an overall assessment of risk and replenishment requirements.

3.3 Age and Degradation of Ammunition

3.3.1 Physical

For most ammunition, one or two of the degradation mechanisms will limit its available life. Some of the more common failure mechanisms include:

- Energetic materials: De-bonding between the material and inert surfaces; stabilizer depletion within the energetic material; migration of compounds within the energetic material; cracking of brittle materials; and/or compatibility problems.
- Electronics: Component ageing; and/or component shock damage.
- Structure: O-ring failure; Mechanical damage (impact, corrosion); and/or vibration.

3.3.2 Chemical

In addition to the physical damage caused by shock and vibration, ammunition also degrades chemically. The energetic items that cause the explosive effect are invariably of organic chemical composition and, in common with all other chemical compositions' breakdown, migrate or change over time. This change is normally accelerated with increased temperature. Degradation is be hastened by: large variations in temperature (i.e., cycling from hot to cold); low temperatures; high or low humidity; vibration; shock; and/or pressure. The conditions under which ammunition is stored, maintained and transported during its normal in-service life will eventually have an impact on the ammunition and a critical failure mode will be reached, which will be the service-life limiting factor.

3.3.3 Climatic Impact

3.3.3.1 The effects of weather, hot temperatures, direct solar radiation, daily temperature changes (diurnal cycling) and high humidity may rapidly degrade the performance and safety of explosives. Ammunition is designed for use under stated climatic conditions, and its service life will be significantly reduced if it is stored under climatic conditions for which it was not designed. In cases of severe climatic change, ammunition may rapidly become unserviceable and dangerous to use.

3.3.3.2 During prolonged periods of storage, the rate of propellant chemical deterioration is approximately tripled for every 10°C rise in temperature above 30°C. Most propellants, dependent on design, have a shelf life of at least 15 to 40 years when stored at a constant 30°C, and will last much longer in temperate climates. In high heat environments the stabilizer is depleted far quicker and the probability of spontaneous combustion due to autocatalytic ignition becomes much higher. If a T/PCC is unable to provide constant storage conditions below 30°C or provide specific in-service proof and surveillance details, the mission SATO can reduce the accepted shelf life according to IATG 7.20 Para 7.3. Necessary early replenishment of ammunition is a national responsibility.

3.4 Determining Shelf Life

3.4.1 Surveillance and In-Service Proof

3.4.1.1 Purpose of Surveillance and In-Service Proof

The safety and stability of ammunition in storage can only be established by a comprehensive 'Ammunition Surveillance' system that uses a methodology of both physical inspection by trained personnel and chemical analysis. The surveillance is carried out systematically by evaluating the characteristics and properties the ammunition type possesses and measuring how the ammunition performs throughout its entire life cycle to allow assessment of the safety, reliability and operational effectiveness of the ammunition. The major reasons to conduct surveillance and in-service proof are:

- To ensure the safety and stability of ammunition in storage;
- To ensure the safety, reliability and performance of ammunition during use;
- To predict and therefore prevent ammunition failures that are inherent in their design or the result of aging;
- To monitor the environmental conditions under which the ammunition has been stored;

- To ensure that the first point of detection of catastrophic failures is not the user;
- To predict failure and degraded performance in support of effective ammunition procurement cycles;
- To predict future performance, service life and limitations;
- To extend the in-service life of ammunition beyond that which it would normally have without such a system; and
- To identify and monitor critical characteristics of the ammunition that change with age and exposure to the environment.

Surveillance and in-service proof can be used to extend the shelf life of ammunition if appropriate.

3.4.1.2 Requirements for Effective Surveillance and In-Service Proof

An effective system of surveillance and in-service proof requires an integrated range of capabilities and mechanisms to ensure overall system efficiency and effectiveness. These are:

- An effective ammunition management plan;
- A trained and experienced technical staff;
- A capable explosives laboratory;
- An effective sampling mechanism; and
- An efficient ammunition accounting system.

An explosives laboratory and the ability to conduct sample tests are not available in-mission, the T/PCCs shall conduct these tests, preferably on ammunition from the same batch and stored in similar conditions, in their home countries and provide certificates of balance of shelf life for the deployed ammunition. Based on the results of the surveillance and in-service proof, decisions may be taken on the extension of the in-service life of an ammunition, or the need for its destruction. To simplify and reduce these difficult procedures as much as possible, no ammunition will be accepted for deployment which has crossed its ½ of the original shelf life as described under 3.5.2. This can only be waivered by the Head of Mission, based on the WAAB recommendation.

3.4.1.3 Responsibilities for In-Service Proof and Surveillance

The contingent ammunition technical officer or a technical expert should be responsible for:

- The development and promulgation of an in-service proof and surveillance plan for each ammunition type in the national inventory;
- Ensuring that the plan is carried out;
- Coordination with their respective national authorities on the requirement of tests, provision of certificates and delivery of ammunition that has NOT crossed ½ of its original shelf life.
- Ensuring that ammunition is allocated the appropriate condition code;
- Rapid identification of stocks that are unsafe to either use or store; and,
- Ensuring that the disposal of expired stocks takes place within an expedient time period following in-service proof and surveillance.

3.4.1.4 Surveillance and Monitoring of Ammunition in Field Missions

In field missions, regular ammunition surveillance is the responsibility of T/PCCs. It requires the deployment of at least one ATO or a technical expert with each contingent as part of the prescribed troop strength. Technical support, if needed, shall be provided by the SATO. The SATO shall monitor the surveillance of T/PCCs and confirm such during periodic inspections, or as required. T/PCCs shall regularly conduct surveillance to confirm or assess:

- The environmental conditions to which ammunition systems have been exposed during their storage and deployment to date. This information can be used to confirm either ammunition stock records or data from environmental data logs;
- Any physical degradation of the condition of the ammunition;
- Any degradation of ammunition and component performance, which is possible through:
  - Recording and monitoring reliability and defect reports concerning in-service usage of the ammunition system;
  - Carrying out functional proof (performance) firing if facilities are available; and/or,
  - Gathering performance data during training use, if ranges are available.
- Changes in the physical and chemical characteristics of energetic materials and non-energetic materials judged to affect the life of the ammunition, when a laboratory is available, or a field test is possible

The design of the ammunition surveillance program should be determined by the complexity of the ammunition and the likely failure mechanisms. Analysis of these factors should then determine the types and frequency of inspections and tests that are required to make assessments of future in-service /shelf life.

Reference to IATG 07.20

3.4.2 Responsibility for Extension of Shelf Life

In-service proof and surveillance is the responsibility of the T/PCCs, including the responsibility for extension of ammunition shelf life. The national technical authority may extend the service life of an ammunition when test results indicate that ammunition still falls within acceptable performance parameters as per IATG 07.20. Each extension of ammunition used in the mission must be reported to the mission SATO.

3.4.3 Ammunition Shelf Life

The shelf life of ammunition is provided by the manufacturer. T/PCCs shall provide the date of manufacture to ascertain the balance of ammunition shelf life. This should be provided during the PDV and on deployment**.** The shelf life of the ammunition stored under ideal conditions (specified by the manufacturer) shall be considered the shelf life as stated by its manufacturer. The T/PCCs are to make every effort to provide the ammunition containers with adequate temperature and humidity control to avoid reduction in shelf life due to climatic conditions. When such measures are not provided, the T/PCC must conduct regular tests of their ammunition and provide shelf life certificates. When the T/PCC fails to provide shelf life certificates before the ammunition's expiration, the mission SATO can declare the

ammunition unserviceable. The SATO may declare any ammunition unserviceable based on the physical deterioration signs.

3.5 Upper Age Limit of Ammunition

3.5.1 Purpose

T/PCCs are supposed to deploy to the mission with ammunition with an expected life in excess of the anticipated length of deployment as per COE Manual A/72/288, Chapter 3, Annex A, paragraph 31. It is necessary to fix the upper age limit of ammunition being deployed in the mission area assuming that the ammunition was stored under ideal conditions by the T/PCCs or the conditions otherwise specified by the T/PCC to avoid the untimely disposal of shelf life expired ammunition. Under ideal conditions, ammunition with the shortest shelf life will be consumed as training ammunition for standard training and be replenished with new operational ammunition.

3.5.2 Fixing the Upper Age Limit of Ammunition Being Deployed

No ammunition will be accepted for deployment which has crossed **½ of** its **original shelf life** as stated by manufacturer. T/PCCs shall produce a manufacturer's certificate stating the production year and estimated shelf life of the ammunition being deployed in the mission area. T/PCCs shall certify that all ammunition deployed in support of national contingents is "safe to deploy" and is subject to a surveillance and proof program fully in compliance with the requirements of IATG 07.20 Surveillance and Proof as per IATG 04.20. Form at Annex C which shall be completed and distributed as indicated on the form.

3.5.3 Redeployment/Emergency Deployment

In case of redeployment from one mission to another, and emergency deployment where T/PCCs might have ammunition which does not meet the above criteria, exceptions may be provided to deploy it on a case-by-case basis. In these cases, T/PCCs may be allowed to deploy with existing ammunition on the condition that they replace it as soon as possible. The replenishment plan for such ammunition will be monitored by the SATO during the COE operational readiness inspections.

3.5.4 Confirmation of Age/Condition of Ammunition During the PDV

Prior to deployment, T/PCCs must provide a list of ammunition planned for deployment along with the date of manufacture and remaining shelf life. The PDV Team shall confirm the remaining shelf life and condition of ammunition in accordance with these guidelines. T/PCCs are to provide 'safe to deploy' certificates as per Form IATG 04.20, Annex C during PDV.

References: IATG 04.20
IATG 07.20

CHAPTER 4

Expiration, Replenishment and Disposal of Ammunition

4.1 Introduction

As described in Chapter 3, the Mission **S**ATO or appropriate representatives will confirm the expiration of ammunition shelf life during the inspection and can declare it unserviceable based on its physical condition, the expiration dates, reduced shelf life based on storage conditions or when T/PCCs fail to provide the certificate of extended or balance of shelf life. T/PCCs are responsible to plan and process for the replenishment of ammunition nearing expiration well in advance.

4.2 Identification of Expired Ammunition

4.2.1 Early Warning of Expired Ammunition During Inspections

As per mission-specific guidelines (based on this manual) the shelf life of ammunition will be determined by the mission SATO. Accordingly, when at least 18 months are left before expiration of any type of ammunition, as identified during inspection or otherwise reported, T/PCCs will be notified about the state of the expiring ammunition through their contingent commanders or the contingent ATOs/technical experts. If no action is taken by the T/PCC for the replenishment of such ammunition, or provision of extension of shelf life certificate within six months, the mission will request UNHQ to raise this issue with the respective Permanent Mission in New York.

4.2.2 Processing Replenishment of Expiring Ammunition Before its Declaration as Unserviceable, or Production of the Shelf Life Extension Certificate

Upon receiving the warning of ammunition proceeding towards expiration, T/PCCs may request a shelf life extension certificate from their national technical authority following the process described in IATG 07.20 or may request the replenishment of said ammunition. This process of shelf life extension or replenishment must be completed before the expiration of the ammunition and its subsequent disposal.

4.2.3 Declaration of Expired Ammunition as Unserviceable Ammunition

If the T/PCCs are unable to provide the shelf life extension certificate for the ammunition which has expired (as specified by the manufacturer, this manual or as otherwise instructed by appropriate authority, the SATO or his/her appropriate representative will declare the ammunition unserviceable according to COE procedures regardless of its physical condition. Weapons without serviceable ammunition will also be declared unserviceable until the replenishment is completed.

4.2.4 Replenishment of Unserviceable Ammunition

Upon confirmation of expiring ammunition, T/PCCs will obtain clearance from the mission SATO/COE Unit for processing its replenishment. In this case, the SATO/COE Unit will check the records for its initial deployment and confirm that the ammunition was deployed in the mission with considerable shelf life remaining as specified in these guidelines and has lost its shelf life being deployed in the mission area. Thereafter, the Force/Police HQ will recommend the ammunition for replenishment.

4.3 Disposal of Unserviceable Ammunition

4.3.1 Necessity of Disposal of Unserviceable Ammunition

Unserviceable ammunition poses a serious threat to the safety of United Nations personnel and the local population, as well as to the environment of the host country. Hence, unserviceable ammunition must be disposed of in the mission area as it is in most cases unsafe for transportation back to the home country. The contingent commander will obtain the authorization for disposal from the national authorities.

4.3.2 Responsibility for Disposal of Unserviceable Ammunition

Force EOD units are responsible for the disposal of unserviceable ammunition, limited to the technical execution of the disposal as declared by the SATO. However, if there are no EOD units in the mission, then the Force/Police HQ may request that UNMAS dispose of the unserviceable ammunition. T/PCC explosives used for demolition of unserviceable ammunition are reimbursable, as per the COE Manual. The mission will generate an operational ammunition expenditure certificate for such used explosives.

4.3.3 Certificate of Disposal of Unserviceable Ammunition

After disposal of unserviceable ammunition by the Force EOD units/UNMAS, a certificate of destruction will be rendered by the Force EOD units/UNMAS to the military/police unit with a copy to the SATO and COE Unit. The SATO will preserve it for future reference.

4.4 Processing Operational Ammunition Expenditure

The procedures for producing operational ammunition expenditure certificates and reimbursements, when applicable, will be in line with the COE Manual and the COE Field Verification and Control Guidelines. The OAEC should be verified by the SATO.

CHAPTER 5

Serviceability Checks and Training for Small Arms Training

5.1 Introduction

The serviceability check of weapons must be confirmed by sighting and calibration of weapons prior to deployment, after any change of user and during periodic test firing training as permitted in the mission area. According to the COE Manual A/72/288, Chapter 3, Annex A, paragraph 31, such normal training ammunition is a national responsibility unless the Force Commander/Police Commissioner specifically authorizes and directs special training beyond accepted T/PCCs readiness standards. This chapter provides guidance on the calculation of normal training ammunition, and the requirement for and conduct of small arms training.

5.2 Requirement of Training/ Practice Firing Ranges

5.2.1 Provision of Firing Ranges

The UN is responsible for providing firing ranges. Field missions shall liaise with their host governments to utilize host government existing firing ranges, if any and if suitable. In the absence of firing ranges offered by the host nation, the mission shall request for formal clearance for the construction of firing ranges and shall liaise with the host government to find suitable sites for firing ranges. An environmental impact assessment should be carried out prior to site selection in accordance with Standard Operating Procedure (2019.09). The UN is responsible to ensure access to a firing range for any operational unit, especially at the beginning of each rotation to ensure that every small weapon is sighted and calibrated properly.

5.2.2 Construction and Closure of Firing Ranges

Upon receiving clearance from the host government, field missions shall construct firing ranges in compliance with all safety requirements. Prior to construction, field missions are to establish a Range Siting Board to assess and approve the proposed location and to approve the firing range's proposed design for the weapons authorized to be used and for the range practices authorized to be conducted. Further details are at Annex L. Similarly, when a firing range is to be closed, usually during the drawdown and liquidation phase of the mission, the site will be remediated to ensure all lead shot is removed from the site (in coordination with the host government).

5.2.3 Use of Firing Ranges

Field missions will establish a Range Safety Board when using firing ranges either host government provided, or mission constructed. For mission-constructed ranges, the Range Safety Board is to provide certified assessments to the Range Siting Board on safety issues associated with the range siting and

construction design. The Range Safety Board is to assess safety issues for each range being used, either host government provided, or mission constructed, and ensure their inclusion in Range Safety Orders. Prior to any range use, the Range Safety Board is to ensure Range Safety Orders and Range Standing Orders are drafted and, after review, are to recommend their approval by the DMS/CMS, the Force Commander and the Police Commissioner. Further details are at Annex L. Missions may consider having the SRSG approve these orders on the recommendation of the Force Commander and DMS/CMS. The Range Safety Board is to inspect each range and review each range's safety and standing orders at least once annually.

5.3 Frequency of Practice/ Firing Training

5.3.1 Determination of Force Firing Standards

DPO/Integrated Training Service (ITS)/OMA/PD may set parameters for training during pre-deployment, induction and in-mission phases in consultation with member states to determine force firing standards. Ongoing training, such as live firing maintains firing standards and provides remedial training. Mission-specific operational firing training guidance should address possible training gaps and shall be scenario-based.

5.3.2 Determination of Firing Frequency During Deployment

Soldiers/police shall undergo firing training at least once every 6 months during their United Nations tour of duty (TOD). T/PCCs shall follow their own national SOPs regarding the level/standard of firing and must conduct firing tests to confirm the serviceability of weapons. Military aviation units shall have their own regular training requirements, as approved by national SOPs and based on the availability of suitable ranges.

5.4 Determination of Scale

Training ammunition (**for machine guns, rifles and pistol**), for both routine and beyond United Nations readiness standards, referred to in COE Manual, chapter 3, Annex A, shall be part of the regular operational ammunition deployed in the mission. On an annual basis, Military/Police units can use up to 10% of their overall authorized ammunition quantity for training purposes. Refer to Annex K of this manual for military aviation unit scales of training ammunition. Tank and artillery training ammunition is not included in this manual.

5.5 Conduct of Firing

5.5.1 Safety Arrangements Before Firing

All safety measures specified in the Range SOPs shall be taken before firing and certified by the firing range officer. The local police shall be informed well in advance and a representative of the local police may be present during the firing practice, if possible.

5.5.2 Confirmation of Safe Range After Firing

After the firing training, a certificate from the responsible authority, which could be the land-owner or the local police or administration, shall be obtained by the field mission (concerned contingent), confirming that the range is safe (cleared from all unexploded ordnance and hazardous materials) and that there is no harm to local population and property.

5.5.3 Disposal of Fired Cartridge Cases (FCC)

For environmentally compliant disposal in line with the DPKO/DFS Environmental Policy for United Nations Field missions (2009.06), military/police units are to deposit the FCC with the Mission Property Disposal Unit (PDU), for subsequent disposal. Units must be given the necessary receipt voucher documenting the deposited FCC. Similarly, the EOD Unit/UNMAS will hand over to the Mission PDU the FCC of any ammunition they obtain. The mission SATO, EOD Unit or UNMAS, shall render a certificate to the PDU stating that the FCCs are free from explosives and safe for disposal as metal waste. The depositing unit shall report to the SATO (by means of a certificate from the Commanding Officer) stating whether or not there are any lost FCC.

5.5.4 Removal of Lead Shots Following Firing Range Closure

Removal of used lead shot from a firing range after its closure is a key action to ensure mitigation of environmental and public health hazards once the area is reviewed for alternative land use. Remediation of the firing range should be conducted by the field mission (Engineering Section) and will require the careful excavation of materials and soil from the range impact zone, and extraction of spent lead bullets, usually through a sieving process, to remove all lead shot and fragments. Once the soil is deemed remediated as indicated by soil analysis that show that safe lead content thresholds have been reached, the soil may be replaced or disposed of as landfill with the removed lead shot sold or provided to a scrap metal vendor for recycling.

ANNEX A

Ammunition Container Specifications

Due to the temporary nature of any United Nations mission, it is not always feasible to construct a purpose-built ammunition storehouse. Troop/Police Contributing Countries (T/PCCs) are thus required to deploy ammunition containers as part of the Memorandum of Understanding (MOU)/ Statement of Unit Requirements (SUR).

An Ammunition Container must:

- Be no larger than 20-foot containers. Ammunition containers larger than 20 feet pose transportation problems that restrict their deployment.
- Be in good condition to meet international shipping standards, free from damage and corrosion and have all locks and hinges serviceable.
- Have adequate humidity and temperature control measures (air conditioner) (see IATG 05.40 clause 5.3.1).
- Have a thermometer / temperature reader.
- Be in compliance with the safety standards for electrical fixtures, fittings and installations (IATG 05.40, Chapter 5). All electrical installations that exceed the energy limits of electro-explosive device (EED) test equipment should be contained by a compliant enclosure with a minimum of IP44 or national equivalent protection.
- Possess grounding equipment and have prepared grounding connection points.

Desirable specifications which T/PCCs may like to include for improved safety:

- Internal light.
- Fire / smoke detectors.
- Internal fire-retardant wall.
- Concealed wiring.
- Sophisticated lock system with collapsible gate.
- Water Sprinkler/Hydrant System.
- Vertical lashing points and lashing straps.
- Humidity gauge.

- Data logger for temperature, humidity and shock.

In-mission safety requirements include:

- Electrical fixtures and fittings must comply with IATG 05.40.
- Magazine must not contain additional combustible material not part of the stockpile.
- Containers should be raised on solid foundations, not directly contacting the ground, with a minimum foundation height of 12 inches/30 centimeters.
- A sunshade (roof) of sufficient size should be constructed to reduce the temperature fluctuations (container walls must be shaded during the day).
- Containers must be grounded and equipped with a lightning protection system.
- Firefighting point must be located close-by.
- Intruder Detection System (recommended).
- Access Control System.
- Overhead protection for reduction of explosion effects and protection against enemy fire (artillery attack), depending on the threat.
- All around protection of container walls against enemy fire and to contain blast effects, either by digging in the container or by the use of sand bags, HESCO barriers, etc. according to the standards of IATG 04.20.

ANNEX B

Fire and Emergency Plan (FEP) Responsibilities and Organization

- The contingent commander is responsible for the protection of ammunition from fire, as well as for the protection of personnel from fire hazards involving ammunition. The contingent commander, along with his designated specialists (e.g.: SATO and Fire Protection Officer (FPO)) will develop the necessary plans as described below. All personnel working at the ammunition area must be aware of their responsibilities and expected actions in the event of an emergency.
- A Fire and Emergency Plan (FEP) should be developed for each compound. Emergency response and evacuation provisions must be developed for each PES located in the Ammunition Area. An exercise of the FEP should occur at least once during each rotation of the operational commander or a minimum of once every six calendar months.
- The FEP shall require that the fire department response for response knows the hazards associated with each ammunition Fire Division Symbol. In addition, the fire department must know what Fire Division is associated with every PES (see below). The fire department should be notified each time a Fire Division symbol is changed.
- Have a Layout plan for the Ammunition Area, including content/type/Fire Division plans and evacuation plans, are always to be prepared and kept accessible outside the Ammunition Area.
- Emergency Withdrawal Distance (EWD) for non-essential personnel (those not directly involved in firefighting) are intended for use in emergency situations only and are not to be used for facility siting purposes. In the event of a fire, no personnel other than those directly involved in firefighting shall be permitted entrance to the Ammunition Area.
- The same EWD applies to the local population, in the event that the facility is located close to civilian population.
- The EWD is governed by the Hazard Division (HD) involved in the fire. The EWD for essential personnel at accidents shall be determined by on-site emergency authorities. Emergency authorities shall also determine who are considered essential personnel.

At a minimum, the FEP shall address:

- Specific sections and guidance that address emergency preparedness, contingency planning and safety. For safety, limit access to trained and authorized personnel only. Identify the number and

location of specific locations (i.e., protective structure(s), or other safe location(s)), for personnel to take shelter.

- Procedures to minimize the possibility of an unintentional detonation, release, discharge or migration of military munitions or explosives out of any storage unit when such release, discharge or migration may endanger human health or the environment.
- Provisions for prompt notification to emergency response and environmental agencies and the potentially affected public for an actual or potential detonation or uncontrolled release, discharge or migration (that may endanger human health or the environment).
- First aid instruction and use of firefighting equipment.
- Emergency map.

ANNEX C

Inspection Template

The purpose of scheduled or unscheduled explosives safety inspections is to detect hazards to life, materiel and facilities. Inspections will provide positive accident prevention measures by:

- Detecting unsafe conditions and personnel operating errors.
- Highlighting the need for specific safeguards for personnel, materiel and facilities.
- Encouraging individuals to increase their overall explosives safety awareness within their own operating or training areas and to cultivate improvement.

The lines below address some important points (see also IATG 06.70). The key document is the ammunition storage SOP in the camp, approved by the SATO, that serves as the guide for inspection documentation.

Verification

- Are SOPs written and updated?
- Do SOPs contain the required elements?
- Are magazine inspections updated.
- Are deficiencies properly reported?
- Are corrective actions completed in a timely manner?
- Are corrective actions verified?
- When was last inspection by a SATO?

Storage Situation

- Is the Net Explosive Quantity (NEQ) limit to each Potential Explosive Site (PES) verified and documented (licensed)?
- Are inhibited building distance (IBD)/public traffic route distance (PTRD) fixed and respected according to IATG 04.20?
- Are calculated IQD from PES to Exposed Site (ES)/accommodations/facilities in the field camp respected?
- Are there any deviations from the current storage regulations?
- Are barricades in good condition?
- Can people in the ammunition storage area be verified at all time?
- Are workers authorized within a properly described working area?
- Are ammunition workers well trained to handle the ammunition?
- Are ammunition workers properly following the correct procedures?

- Are equipment and tools in good condition and safe?
- Is electrical installation correct and permissible for use near explosives?
- Is non-standard ammunition separated from standard ammunition?
- Is the storage area restricted to authorized?
- Do the physical security infrastructure, procedures and installation meet requirements?
- Is the Climate Control log maintained?
- Is unsafe ammunition stored according to these guidelines?
- Is a standard ammunition container used as prescribed in these guidelines?

Ammunition Stacks

- Are the stacks in good condition?
- Are the stacks protected from weather?
- Is the allowed quantity in the stack?
- Is ammunition stored by compatibility groups?
- Is the packaging correct?
- Is the area clean?
- Are correct inventory and stack tally cards present for each ammunition batch/LOT?

Lightning Protection/Grounding

- Are the containers grounded?
- Is the Lightning Protection System (LPS) effective?
- Are checks of the LPS documented?

Fire Protection

- Are fire protection rules established?
- Are there any open fires near the storage areas?
- Is vegetation near the storage area appropriately trimmed?
- Are fire breaks adequate?
- Do alarm systems exist and are their signals understood?
- Is an ATO notified if ammunition is involved in a fire?
- Is/are the assembly point/s planned and known?
- Are fire hazard symbols used?
- Is the firefighting equipment in place?

- Is there cooperation between the SATO and the Fire Protection Officer (FPO).
- Are the firefighting procedures understood between the FPO and rescue forces?
- Are all people in the camp informed of their correct reaction in case of an ammunition fire?

Ammunition Loaded Vehicles

- Are safety distances to accommodation and buildings maintained?
- Are parking areas a minimum of 25m away from ammunition stacks?
- Are parking places barricaded?

Drivers

- Do drivers know the standard hazard distances of their load in case of a fire?
- Do drivers know the basic emergency and alert actions?
- Have drivers received training for transport of dangerous goods?

Shelf Life-Expired Ammunition

- Is there have shelf life expired ammunition present?
- Is shelf life expired ammunition kept separated from serviceable ammunition?
- What is the plan for to shelf life expired ammunition?
- Is there ammunition which is approaching expiration (ammunition that has crossed ¾ of its rated shelf life)?
- If so, what action has been taken?
- Is there a "safe to deploy" certificate for ammunition which has been brought into the mission area?

Expenditure of Ammunition

- Was any ammunition expended on operations or training?
- Was any ammunition disposed of by the mission EOD unit/UNMAS?
- Are there have appropriate documents accounting for ammunition expended/disposed of (i.e., OAEC/destruction certificate by the EOD unit/UNMAS)?
- Did they request replenishment as per OAEC?

A standard format for the SATO to conduct ammunition inspections at the contingent is attached as Enclosure 1 to this Annex.

APPENDIX 1 TO

ANNEX C

Ammunition Inspection Report

Name of Unit: Location:

Date of Inspection:

PART A **VERIFICATION**		**REMARKS**
1.	Are the SOPs written and updated?	
2.	Do the SOPs contain required elements?	
3.	Are magazine inspections current?	
4.	Are deficiencies properly reported?	
5.	When was last inspection carried out by SATO?	
6.	Are corrective actions completed in a timely manner?	
7.	Are corrective actions verified?	
8.	Are ammunition transactions properly documented?	

PART B **AMMUNITION STORAGE AREA**		
1.	Number and type of magazine(s)	
2.	Does the unit have standard ammunition containers/magazines as prescribed in the guidelines?	
3.	Are magazines properly maintained?	
4.	Is the storage area kept clean?	
5.	Are warning signs posted?	
6.	Is ammunition stored by compatibility groups?	
7.	Are barricades, barriers and blast walls available?	
8.	Are barricades, barriers and blast walls in good condition?	

9.	Is ammunition limited to the permitted quantities and explosive limits?	
10.	Is the quantity limit for each PES verified and documented (licensed)?	
11.	Are inhibited building distance (IBD)/public traffic route distance (PTRD) fixed and respected?	
12.	Are calculated origin distances from PES to ES/accommodations/facilities in the field camp respected?	
13.	Are there any deviations from the current storage regulations?	
14.	If so, are the deviations acknowledged and approved by mission leadership?	
15.	Can persons in the ammunition area, be verified at all times?	
16.	Are workers authorized within a properly described working area?	
17.	Are ammunition workers well instructed to handle the ammunition?	
18.	Are ammunition workers properly following procedures?	
19.	Are equipment and the tools in good condition and safe?	
20.	Is electrical installation correct and permissible for use near explosives?	
21.	Is non-standard ammunition separated from standard ammunition?	
22.	Is the storage area restricted to regular traffic?	
23.	Is the Climate Control log maintained	
24.	Replacement or exchange ammunition for operational or training?	
25.	Are ammunition packages marked?	
26.	Is a dehumidifier present and working?	
27.	Is unserviceable ammunition accumulating?	
28.	Is FFE discipline enforced?	
29.	Is overall maintenance of ammunition acceptable?	

PART C **AMMUNITION STACKS**		
1.	Are the stacks in good condition?	
2.	Are the stacks protected from the weather?	
3.	Is there dunnage under the stacks?	
4.	Are the stacks stable?	
5.	Is there sufficient clearance between the stacks and walls?	
6.	Is the correct limitation on stacking heights observed?	
7.	Is the correct limitation on quantities in the stack observed?	
8.	Are items stacked by type and lot number?	
9.	Is ammunition correctly stored by compatibility group?	
10.	Is there sufficient ventilation?	
11.	Are there open packages or loose ammunition in the stacks?	
12.	Is the inventory correct?	
13.	Does the general condition of ammunition meet requirements?	

PART D **EXPIRATION AND DISPOSAL**		
1.	Do they have shelf life expired ammunition?	
2.	Is shelf life expired ammunition kept separated from serviceable ammunition?	
3.	What action is taken with respect to shelf life expired ammunition?	
4.	Does the unit have ammunition approaching expiration (ammunition that has crossed ¾ of its shelf life)?	
5.	If so, what action is taken in this regard?	
6.	Does the unit have a “safe to deploy” certificate for ammunition which has been brought into the mission area?	
7.	Did the unit expend any ammunition during operations or training?	
8.	Was any unit ammunition disposed of by the mission EOD unit/UNMAS?	

9.	Does the unit have the appropriate documentation for ammunition expended/disposed of OAEC/destruction certificate by EOD unit/UNMAS)?	
10.	Did the unit submit a claim for replenishment as per OAEC?	

PART E **SAFETY, SECURITY AND FIRE PROTECTION**		
1.	Are storage containers grounded?	
2.	Is the Lightning Protection System (LPS) effective?	
3.	Are checks of the LPS documented?	
4.	Do the physical security infrastructure, procedures and installation meet requirements?	
5.	What is the type and condition of fences?	
6.	Is there an effecting guard system?	
7.	Are the names and photographs of responsible personnel (authenticated by the unit commander) available at the entrance of the magazine?	
8.	Is temperature chart maintained daily and action taken in case the temperature above exceeds 30˚C?	
9.	Are fire protection rules established?	
10.	Is firefighting equipment in place?	
11.	Are fire hazard symbols displayed correctly?	
12.	Are combustible items, waste material precautions and vegetation control practiced?	
13.	Are fire breaks adequate?	
14.	Do alarm systems exist and are the signals understood?	
15.	Is an ATO notified if ammunition is involved in a fire?	
16.	Is/are the assembly point/-s planned and known?	
17.	Are fire-fighting procedures clarified with the FPO and rescue forces?	

18.	Are all people in the camp informed of the correct reaction in case of an ammunition fire?	
19.	Is fire-fighting practice regularly held and documented?	
20.	Are white phosphorus precautions in place?	

PART F **MISCELLANEOUS**		
1.	Are parking areas a minimum of 25m away from ammunition stacks?	
2.	Are the parking lots barricaded?	
3.	Do drivers know the standard hazard distances of their load in case of a fire?	
4.	Do drivers know the basic emergency and alert responses?	
5.	Have drivers received training for the safe transport of dangerous goods?	
6.	Have ammunition storage personnel responsible for the maintenance and handling of ammunition received adequate training?	

PART – G

INSPECTING OFFICER'S COMMENTS

PART – H

COMMANDING OFFICER'S OPINION

PART – J

SECTOR/BRIGADE COMMANDER'S OPINION

PART – K

FORCE COMMANDER'S REMARKS

ANNEX D

SATO's Competences & Responsibility

Competences

1. The SATO must be qualified through a national Ammunition Technical Officer's Course according to IATG 01.90, Annex L.

2. He/she should:

- Have the knowledge and understanding of DPO Ammunition Management Guidelines for Peacekeeping Operations, as well as IATG and IATG-recommended ammunition management standards and guidelines.
- Have solid knowledge of Risk Management and practical knowledge of risk mitigation measures concerning ammunition management and storage.
- Be able to identify Inside Quantity Distance (IQD) and Outside Quantity Distance (OQD) applied from Potential Explosive Site (PES) to PES and to an Explosive Site (ES).
- Be able to plan an Ammunition Area (e.g., number of PES required, barricade requirements, appropriate Inside Quantity Distance (IQD) and Outside Quantity Distance (OQD).
- Be able to organize an ammunition field depot based on economical storage principles and procedures.
- Have the knowledge and understanding of lightning protection systems and fire prevention requirements.
- Be able to visually identify the explosive safety standards shortcomings during a survey of ammunition storage and maintenance operations.
- Be knowledgeable of the accident reporting procedures.
- Be able to develop an SOP.
- Be able to determine the risks and consequences of deviations from the regulations and communicate with the operational commander the mitigating efforts necessary to reduce or eliminate hazards.
- Be able to prepare draft explosives licences.

Responsibilities

3. The SATO in the field missions is responsible for the following duties:

- Provide technical assistance and advice in connection with the safety, storage and maintenance standards of ammunition and explosives held by the units of T/PCCs.

- Carry out periodic, operational and arrival/repatriation inspections of ammunition and explosives of T/PCC units along with the Contingent-Owned Equipment (COE) Unit team or separately. Report on all mission ammunition/explosives and their storage condition in the SATO Ammunition Inspection Report.
- Act as the senior ammunition specialist and safety officer and be responsible for advising the Force Commander on all ammunition and explosives safety matters.
- Provide direction and advice on all technical matters related to ammunition/explosives.
- Conduct special inspections of unserviceable, expired and segregated ammunition and explosives and recommend their disposal (in the mission area) to the concerned force EOD units/UNMAS.
- As and when required, conduct Dangerous Goods (DG)-Ammunition/Explosives inspections and provide a DG certificate prior to any bulk move of ammunition/explosives, particularly when moved by air.
- Coordinate risk assessments in connection with ammunition and explosives.
- Prepare/update all necessary Ammunition and Explosives Regulations and technical SOPs according to the United Nations ammunition/explosives safety criteria.
- Develop and operate of the ammunition storage licensing system in accordance with IATG Clause 2.30, “Licensing of Explosive Facilities”.
- Attend the COE and MOU Management Review Board (CMMRB)/and any meeting the matter related to ammunition and explosives.
- Assist the COE Team during Operational Readiness Inspections (ORI) with expert opinion on ammunition and, to a limited extent, armaments.
- Advise the PDV Team on matters related to T/PCC ammunition and explosives prior to the visit.
- Act as WAAB Manager.

ANNEX E

The Calculation of Ammunition for Infantry Weapons[8]

Weapon Type	**Accounting Unit**	**Low Level of Ammunition** to be initially deployed (number of rounds/weapon /person/*)	**Medium Level of Ammunition** to be initially deployed (number of rounds/ weapon/person/*)	**High Level of Ammunition** to be initially deployed (number of rounds/ weapon/person/*)	**Remarks**
Pistol/Revolver	Each	60	90	120	
Rifle/Carbine/ individual Machine Gun	Each	360	540	720	
Shot Gun	Each	50	75	100	
Sniper Rifle (up to 10mm)	Each	150	225	300	
Sniper Rifle (up to 15mm)	Each	150	225	300	
Anti-Tank Grenade Launcher (40 mm)	Each	6	9	12	
Anti-Tank Grenade Launcher (60–80 mm)	Each	6	9	12	
Crew-Served Machine Gun (up to 10 mm)	Each	2000	3000	4000	
Crew-Served Machine Gun (11–15 mm)	Each	4000	6000	8000	
Mortar (up to 60 mm) - HE	Each	72	108	144	
Mortar (up to 60 mm) – Illumination	Each	16	24	32	
Mortar (up to 60 mm) – Smoke	Each	12	18	24	
Mortar (61–82 mm) - HE	Each	150	225	300	
Mortar (61–82 mm) – Illumination	Each	24	36	48	

[8] The basic load must be determined at Mission level depending on the level and nature of threat and other operational criteria. T/PCCs are invited to deploy with all necessary serviceable magazines in a sufficient quantity for any individual and crew served weapon as per their national doctrine.

Weapon Type	**Accounting Unit**	**Low Level of Ammunition** to be initially deployed (number of rounds/weapon /person/*)	**Medium Level of Ammunition** to be initially deployed (number of rounds/ weapon/person/*)	**High Level of Ammunition** to be initially deployed (number of rounds/ weapon/person/*)	**Remarks**
Mortar (61–82 mm) – Smoke	Each	20	30	40	
Mortar (83–122 mm) - HE	Each	150	225	300	
Mortar (83–122 mm) – Illum	Each	24	36	48	
Mortar (83–122 mm) – Smoke	Each	20	30	40	
Recoilless Gun – HE	Each	16	24	32	
Recoilless Gun – HEAT	Each	24	36	48	
Recoilless Gun – Illumination	Each	0	0	0	
Recoilless Gun – Smoke	Each	0	0	0	
Grenade, Hand HE	Each	1	1.5	2	
Grenade, Hand, Smoke Coloured*	Soldier	0.5	0.75	1	
Flare, Trip*	Soldier	0.5	0.75	1	
Miniflare, Coloured	Soldier	1	1.5	2	
Signal Rocket, coloured*	Soldier	1	1.5	2	
Signal Pistol, coloured	Each	12	18	24	
Anti-Armour Missile Launcher	Each	8	12	16	
Anti-Air Missile Launcher, Portable	Each	15	22.5	30	
Anti-Air Missile Launcher Low Level	Each	10	15	20	
Anti-Air Missile Launcher Very Low Level	Each	10	15	20	

ANNEX F

The Calculation of Ammunition for Armor Weapons

Weapon Type	**Accounting Unit**	**Low Level of Ammunition** to be initially deployed (number of rounds/weapon)	**Medium Level of Ammunition** to be initially deployed (number of rounds/weapon)	**High Level of Ammunition** to be initially deployed (number of rounds/weapon)	**Remarks**
Main Battle Tank, Medium (up to 50 tons) - Main Armament	Each	75	112.5	150	
Main Battle Tank, Medium (up to 50 tons) - Mounted Machine Gun	Each	1400	2100	2800	
Main Battle Tank, Medium (up to 50 tons) - Smoke Discharger	Each	6	9	12	
Main Battle Tank, Heavy (more than 50 tons) - Main Armament	Each	75	112.5	150	
Main Battle Tank, Heavy (more than 50 tons) - Mounted Machine Gun	Each	1400	2100	2800	
Main Battle Tank, Heavy (more than 50 tons) - Smoke Discharger	Each	6	9	12	
Infantry Carrier, Armed (Tracked or Wheeled/Mounted machine gun)	Each	1400	2100	2800	
Reconnaissance Vehicle, Wheeled/ Mounted machine gun, up to 25 mm	Each	500	750	1000	
Reconnaissance Vehicle, Wheeled/Mounted machine gun, more than 25 mm	Each	500	750	1000	
Reconnaissance Vehicle Wheeled/ Mounted machine gun, more than 50 mm	Each	500	750	1000	
Reconnaissance Vehicle Wheeled/Mounted machine gun more than 100 mm	Each	500	750	1000	

ANNEX G

The Calculation of Ammunition for Artillery Weapons

CALCULATION OF OPERATIONAL AMMUNITION FOR TCC - ARTILLERY					
Weapon Type	**Accounting Unit**	**Low Level of Ammunition** to be initially deployed (number of rounds/weapon)	**Medium Level of Ammunition** to be initially deployed (number of rounds/weapon)	**High Level of Ammunition** to be initially deployed (number of rounds/weapon)	**Remarks**
Artillery Rockets					
Up to 90mm	Each	60	90	120	
91mm to 120mm	Each	360	540	720	
121m to 260mm	Each	50	75	100	
Over 260mm	Each	150	225	300	
Field Gun or Howitzer, Self-Propelled or Towed					
Light Howitzer (up to 105 mm) - HE	Each	75	112.5	150	
Light Howitzer (up to 105 mm) - Illumination	Each	15	22.5	30	
Light Howitzer (up to 105 mm) - Smoke	Each	10	15	20	
Medium Howitzer (106 mm - 154 mm) - HE	Each	75	112.5	150	
Medium Howitzer (106 mm-154 mm) - Illumination	Each	15	22.5	30	
Medium Howitzer (106 mm - 154 mm) - Smoke	Each	10	15	20	
Light Howitzer (more than 155 mm) - HE	Each	50	75	100	
Light Howitzer (more than 155 mm) - Illumination	Each	10	15	20	
Light Howitzer (more than 155 mm) - Smoke	Each	5	7.5	10	

ANNEX H

The Calculation of Ammunition for Military Aviation/Aircraft (Per Pilot Per Year).

CALCULATION OF OPERATIONAL AMMUNITION FOR TCC - AIRCRAFT					
Weapon Type	**Accounting Unit**	**Low Level of Ammunition** to be initially deployed (number of rounds)	**Medium Level of Ammunition** to be initially deployed (number of rounds)	**High Level of Ammunition** to be initially deployed (number of rounds)	**Remarks**
Armament Pod, Fixed Wing					
Up to 7.62mm /.30 inch	Each	1000	1500	2000	
Above 7.62mm/ .30 inch	Each	1000	1500	2000	
Chaff	Each	1000	1500	2000	
Flares	Each	1000	1500	2000	
Armament Subsystem, Helicopter					
Up to 7.62mm /.30 inch	Each	1000	1800	2200	
Above 7.62mm/ .30 inch	Each	100	180	220	
Chaff	Each	1000	1500	2000	
Flares	Each	1000	1500	2000	
Rocket 2.75 inch					
HE	Each	60	90	120	
Grenade Launcher, Automatic					
Grenade Launcher, Automatic	Each	750	1125	1500	
Guided missile					
Guided missile	Each	4	6	8	

ANNEX I

The Calculation of Ammunition for Explosive Ordnance Devices

CALCULATION OF OPERATIONAL AMMUNITION FOR TCC - EOD[9]					
Ammunition Type	**Accounting Unit**	**Low Level of Ammunition** to be initially deployed (amount)	**Medium Level of Ammunition** to be initially deployed (amount)	**High Level of Ammunition** to be initially deployed (amount)	**Remarks**
EOD Self-Sustainment (Unit's Accommodation Area) - Demolition Kit – Per Unit					
Primer CE	Each	40	60	80	Only required when needed for TCC- specific explosives.
Slab TNT or Similar (500g)	Each	20	30	40	Can be replaced accordingly by an increased amount of plastic explosive.
Plastic Explosive	Kg	50	75	100	
Cord Detonating	Meter	200	300	400	
Fuze Safety	Meter	100	150	200	
Cap, Blasting, non-electric	Each	50	75	100	
Cap Blasting, electric	Each	100	150	200	
Igniter, Percussion	Each	20	40	60	

[9] The required amount of explosives and demolition stores depends on the Unexploded Ordnance (UXO)/Improvised Explosive Device (IED)/mine contamination level, other involved organizations (for example UNMAS) providing support (including explosives) and can differ from the calculated levels for other ammunition. Stock levels shall only be increased when continuous EOD or mine clearance operations allow specific prediction of operational ammunition expenditure for explosives.

CALCULATION OF OPERATIONAL AMMUNITION FOR TCC - EOD[9]					
Ammunition Type	**Accounting Unit**	**Low Level of Ammunition** to be initially deployed (amount)	**Medium Level of Ammunition** to be initially deployed (amount)	**High Level of Ammunition** to be initially deployed (amount)	**Remarks**
EOD- (Force-wide EOD/De-mining Tasks) - Demolition Kit – Per Unit					
Primer CE	Each	100	150	200	Only required when needed for T/PCC-specific explosives.
Slab TNT or Similar (500gm)	Each	50	75	100	Can be replaced accordingly by an increased amount of plastic explosive.
Plastic Explosive	Kg	400	600	800	
Cord, Detonating	Meter	500	800	1000	
Fuze, Safety	Meter	300	450	600	
Cap, Blasting, non-electric	Each	100	150	200	
Cap, Blasting, electric	Each	100	200	400	
Igniter, Percussion	Each	100	150	200	
Special charges and ignition systems (shaped charges, linear charges, shock tube, etc)		As required	As required	As required	

ANNEX J

The Calculation of Ammunition for UNPOL (FPUs / Individual Police Officers)

CALCULATION OF OPERATIONAL AMMUNITION FOR PCCs					
For Formed Police Units deployed under MOU, according to the COE Manual					
Number of Rounds per Weapon or Minimum Number of Rounds for Twelve Months Operations					
Weapon Type	**Accounting Unit**	**LOW** level of ammunition to be initially deployed (number of rounds/weapon/person)	**MEDIUM** level of ammunition to be initially deployed (number of rounds/weapon/person)	**HIGH** level of ammunition to be initially deployed (number of rounds/weapon/person)	**Remarks**
Individual Weapons:					
Sidearm-Pistol/Revolver	Each	75	150	250	
Rifle	Each	150	300	700	
Sniper Rifle	Each	150	250	350	
Sub Machine Gun	Each	200	350	600	
Launchers / Crew-Served Weapons:					
Crew-Served Gun	Each	250	500	1000	
Anti-Riot CS	Each	75	150	200	
Anti-Riot CS, Exploding	Each	20	40	60	
Smoke	Each	50	80	150	
SKPs (Kinetics)	Each	75	150	250	
Taser	Each	20	40	60	
Signal Pistol	Each	20	30	50	

CALCULATION OF OPERATIONAL AMMUNITION FOR PCCs					
Illumination flare	Each	20	30	50	
Weapons / Launchers, mounted on vehicles:					
Machine Guns	Each	250	500	1000	
Anti-riot CS	Each	75	150	200	
Anti-riot CS, Exploding	Each	25	50	100	
Smoke	Each	75	150	200	
Hand Throwing:					
Grenade, Anti-riot CS	Each	200	500	700	
Grenade, Anti-riot CS Exploding	Each	100	200	300	
Grenade, Stun	Each	50	80	100	
Grenade, Flashbang (Blinding)	Each	50	100	150	
Grenade, Smoke, Coloured	Each	50	100	150	
Signal Rocket, Coloured	Each	20	30	50	
Illuminating flares	Each	20	30	50	
For Specialized Formed Police Units for Any Special Operations in Any Mission					
Various types of ammunition as per authorized weapon	Each				To be decided during the negotiation as per this manual

For Individual Police Officers – UNPOLs					
Minimum Number of Rounds per Weapon for Twelve Months Operations					
Weapon /Type	**Accounting Unit**	**LOW** level of ammunition to be deployed	**MEDIUM** level of ammunition to be deployed	**HIGH** level of ammunition to be deployed	Remarks
Sidearm-Pistol/Revolver (*)	IPOs	75	150	250	Per individual

(*) Mandatory deployment of cleaning kit in support of deployed weapons

ANNEX K

The Calculation of Training Ammunition for Military Aviation Units

CALCULATION TRAINING AMMUNITION OF TCC – AIRCRAFTS (only deployed in field missions with a suitable firing range)		
Weapon Type	**Accounting Unit**	**Proficiency Ammunition** to be initially deployed (Number of rounds)
Armament Pod, Fixed Wing		
Up to 7.62mm /.30 inch	Each	1500
Above 7.62mm/ .30 inch	Each	1500
Chaff	Each	NA
Flares	Each	NA
Armament Subsystem, Helicopter		
Up to 7.62mm /.30 inch	Each	1800
Above 7.62mm/ .30 inch	Each	180
Chaff	Each	NA
Flares	Each	NA
Rocket, 2.75 inch		
HE	Each	15
Grenade Launcher, Automatic		
Grenade Launcher, Automatic	Each	60
Guided Missile		
Guided missile	Each	2

ANNEX L

Range Siting Boards and Range Safety Boards

Range Siting Board

1. Whenever a field mission is considering construction of a new weapons firing range, the mission shall establish a Range Siting Board. Its membership should comprise, at a minimum, when available:

- Senior military officer of rank Lieutenant Colonel (Lt Col) or above to act as chairman
- Senior civilian officer P5 or above
- Senior police official
- Military engineer
- Civilian engineer
- Ammunition technical officer
- Mission environmental officer

Note: The composition may be adjusted based on the mission's structure and experience of available personnel.

2. The DMS, Force Commander and Police Commissioner (if applicable) are to approve and issue the Siting Board's Terms of Reference. Missions may find it of benefit to refer to their TCCs for guidance on the Terms of Reference and procedures for siting board activity.

3. Prior to a Siting Board meeting, the weapons to be fired and the range practices to be conducted are to be finalized and approved.

4. Issues to be considered by the Siting Board are:

- The proposed range site, range orientation, topography, drainage and vegetation.
- Weapon firing templates and range danger zones for the weapons and ammunition approved for use.
- Local human and animal populations.
- Possible human and animal site encroachment.
- Environmental issues.
- Noise and noise attenuation if required.
- Other issues.

5. Upon conclusion of its considerations, the Range Siting Board will compile a report and forward its recommendations for approval/non-approval to the Force Commander, Police Commissioner (if applicable) and DMS/CMS.

6. If a site is approved, the Range Siting Board is to assess the range design proposed to ensure the design meets safety and operational criteria it has established. The Range Siting Board is responsible for recommending that the proposed range design be approved by the Force Commander, Police Commissioner (if applicable) and DMS/CMS as safe and fit for purpose for the weapons and range firing practices approved.

7. The mission Range Safety Board is to provide technical support to the Range Siting Board as required.

Range Safety Board

1. Whenever a mission is considering the use of a firing range offered by the host government or is considering construction of a firing range, it is to establish a Range Safety Board. The Range Safety Board is to remain extant whilst the mission has any firing range in use or under consideration. Its membership should comprise, at a minimum, when available:

- Senior military officer of rank Lt. Col. or above to act as chairman.
- Senior civilian officer P-5, or above.
- Senior police official.
- Ammunition technical officer.
- Contingent representative (x 2 if appropriate).

Note: The composition may be adjusted based on the mission's structure and experience of available personnel.

2. The DMS, Force Commander and Police Commissioner (if applicable) are to approve and issue the Safety Board's Terms of Reference. Missions may find it of benefit to refer to their TCCs for guidance on the Terms of Reference and procedures for Range Safety Board activity.

3. The Range Safety Board is responsible for:

- Providing certified assessments to the Range Siting Board on safety issues associated with any range siting and construction design and provide other technical advice in support of the Range Siting Board's activities;
- For each operational firing range, determining safety requirements including, for example:
  - Communication requirements.
  - Sentry locations and encroachment control.
  - Danger flag locations.
  - Range movement management and restrictions.
  - Other issues relevant to a specific range.
- Reviewing draft Range Safety Orders and Range Standing Orders and recommending their approval. The Range Safety Board may be directed to draft Range Safety Orders.
- Reviewing all safety issues, issuing any amendments and approving as necessary when a new weapon or new firing practice is proposed for a specific range.
- At a minimum, once per year, inspecting each firing range, reviewing the authorized weapons, reviewing the authorized practices, reviewing each Range Safety Orders and reviewing each Range Standing Orders and recommending revisions and amendments as necessary.

5. Range Safety Orders and Range Standing Orders may be issued in a single document.

ANNEX M

Acronyms

ATO	Ammunition Technical Officer
CE	Consolidating Epoxy
COE	Contingent-Owned Equipment
CMMRB	Contingent Owned Equipment and Memorandum of Understanding Management Review Board
CG	Compatibility Group
CMS	Chief of Mission Support
CS	Chlorobenzylidene Malononitrile
DDR	Disarmament, Demobilization and Reintegration
DG	Dangerous Goods
DMS	Director of Mission Support
DOS	Department of Operational Support
DSS	Department of Safety and Security
DPO	Department of Peace Operations
EOD	Explosive Ordnance Disposal
ELL	Explosive Limit Licenses
EM	Electro-Magnetic
ES	Exposed Sites
ESD	Electrostatic Discharge
ESH	Explosive Storehouse
FCC	Fired Cartridge Case
FD	Fire Division
FDS	Field Defense Stores
FFE	Free from Explosives
FGS	Force Generation Service
FPO	Fire Protection Officer
FPU	Formed Police Units
HD	Hazard Division
HE	High Explosives
IATG	International Ammunition Technical Guidelines
IBD	Inhibited Building Distance
IQD	Inside Quantity Distance
OQD	Outside Quantity Distance
ORI	Operational Readiness Inspections
IED	Improvised Explosive Device
ISO	International Standardization Organization
LD	Logistic Division
LOT	Identification or batch number
LMG	Light Machine Gun
LPS	Lightning Protection System
MMG	Medium Machine Gun
MOU	Memorandum of Understanding
MOSAIC	Modular Small-Arms-control Implementation Compendium
NEQ	Net Explosive Quantity
OAEC	Operational Ammunition Expenditure Certificate
OHP	Over Head Protection
OMA	Office of Military Affairs
PCC	Police Contributing Country

PD	Police Division
PDV	Pre-deployment Visit
PES	Potential Explosion Site
PTRD	Public Traffic Route Distance
QD	Quantity Distance
QRA	Quantitative Risk Analysis
SATO	Senior Ammunition Technical Officer
SKP	Soft Kinetic Projectiles
SOFA	Status of Forces Agreement
SOP	Standard Operating Procedures
SRA	Security Risk Assessment
SUR	Statement of Unit Requirements
TCC	Troop Contributing Country
TNT	Trinitrotoluene
TD	Temporary Distance
TOD	Tour of Duty
UCSD	Uniformed Capabilities Support Division
UNODA	United Nations Office of Disarmaments Affairs
UNMAS	United Nations Mine Action Service
UNPO	United Nations peace operations
UNPOL	United Nations Police
UXO	Unexploded Ordnance
WAAB	Weapons and Ammunition Advisory Board
WAM	Weapons and ammunition management
WP	White Phosphorus

ANNEX N

Terms and Definitions

Access Control
A system which enables an authority to control access to areas and resources in a given physical facility.

Accident
An undesired event which results in harm.

Accounting
Information management systems and associated operating procedures that are designed to record, numerically monitor, verify, issue and receive ammunition in organizations and stockpiles.

Ammunition
A complete device, (e.g.: missile, shell, mine, demolition, store, etc.) charged with explosives, propellants, pyrotechnics, initiating composition or nuclear, biological or chemical material for use in connection with offence, or defense, or training, or non-operational purposes, including those parts of weapons systems containing explosives.

Ammunition Accident
Any incident involving ammunition or explosives that results in, or has potential to result in, death or injury to a person(s) and/or damage to equipment and/or property, military or civilian.

Ammunition Container
An approved box, cylinder, metal liner or receptacle that is designed to contain explosive articles or explosives substances. It normally forms part of an ammunition container assembly.

Ammunition Store (unit)
An authorized building containing ammunition under unit control.

Barricade
A natural ground feature, artificial mound, barrier or wall which, for storage purposes, can prevent direct communication of explosion from one quantity of explosives to another, although it may be destroyed in the process.

Combat Load/Basic Load
The quantity of ammunition required to be on hand within, and which can be moved by, a unit or formation. It is expressed according to the wartime organization of the unit or formation and maintained at prescribed levels.

Compatibility
Absence of reactions between explosives and other components within a type of ammunition that could lead to unacceptable changes in physical properties, or sensitivity of explosives in the ammunition.

Compatibility Group (CG)
Grouping identified by a letter which, when referenced to a compatibility table, shows those explosives which may be stored or transported together without significantly increasing the probability of an accident or, for a given quantity, the magnitude of the effects of such an accident. Codes are used to indicate which explosives and compounds may be safely stored together.

Crew-Served Weapon
A weapon operated by more than one designated soldier.

Destruction
The process of final conversion of weapons, ammunition and explosives into an inert state so that the item can no longer function as designed.

Destruction (in situ)
The destruction of any item of explosive ordnance by explosives without moving the item from where it was found - normally by detonating an explosive charge placed alongside.

Evaluation
The analysis of a result or a series of results to establish the quantitative and qualitative effectiveness and worth of software, a component, equipment or system within the environment in which it will operate.

Explosion
Sudden release of energy producing a blast effect with the possible projection of fragments.
The term explosion encompasses fast combustion, deflagration and detonation.

Explosive
Solid or liquid substance or mixture of substances which, by intrinsic chemical reaction can produce an explosion. A substance or mixture of substances, which, under external influences, is capable of rapidly releasing energy in the form of gas and heat.

Explosive Ordnance Disposal (EOD)
The detection, identification, evaluation, rendering safe, recovery and final disposal of unexploded explosive ordnance. EOD may also include the rendering safe and/or disposal of explosive ordnance which has become hazardous by damage or deterioration, when the disposal of such explosive ordnance is beyond the capabilities of those personnel normally assigned the responsibility for routine disposal. The level of EOD response is dictated by the condition of the ammunition, its level of deterioration and the risk to the local community.

Explosives Storehouse
A building designed and erected for the sole purpose of storing explosives, or a building modified, adopted or appropriated for that purpose and approved by a competent authority.

Exposed Site (ES)
A magazine, cell, stack, truck or trailer loaded with ammunition, explosives workshop, inhabited building, assembly place or public traffic route which is exposed to the effects of an explosion (or fire) at the potential explosion site under consideration.

Hazard
Potential source of harm.

Hazard Class
The United Nations system of nine classes for identifying dangerous goods. Class 1 identifies explosives.

Heavy Machine Gun
A crew served machine gun that fires a cartridge larger than standard rifle cartridge (above 7.62mm/.30inch caliber).

High Explosive (HE)
Substance or mixture of substances that can undergo a fast-internal decomposition reaction leading to a detonation in its normal use. A substance or mixture of substances which, includes primer, booster or main charge in the ammunition.

Illumination Ammunition
Ammunition designed to produce a single source of intense light for illuminating an area. The term includes illumination cartridges, grenades and projectiles, as well as illuminating and target identification bombs.

Improvised Explosive Device (IED)
A device placed or fabricated in an improvised manner incorporating explosive material, destructive, lethal, noxious, incendiary, pyrotechnic materials or chemicals designed to destroy, disfigure, distract or harass. They may incorporate military stores but are normally devised from non-military components.

Incendiary Ammunition
Ammunition, containing an incendiary substance which may be a solid, liquid or gel, including white phosphorus.

Inhabited Building
A building or structure occupied in whole or in part by people (usually civilian). Used synonymously with occupied building.

Inhabited Building Distance (IBD)
The minimum permissible distance between potential explosive sites (PES) and non-associated exposed sites (ES) that requires a high degree of protection from an explosion.

Level of Supply
The quantity of supplies or materiel authorized or directed to be held in anticipation of future demands.

Light & Medium Machine Gun
A machine gun which fires a full-sized rifle cartridge. LMGs are normally fitted with a bipod to support the weapon during firing and may be operated by either one soldier or a crew. Medium Machine Gun (MMG) similar to LMG, but usually mounted on tripod and operated only as a crew-served weapon. Able to withstand extended periods of fully automatic firing.

Magazine
Any building, structure, or container approved for the storage of explosive materials. (see also explosive storehouse (ESH).

Net Explosive Quantity (NEQ)
The total explosive content present in a container, ammunition, building, etc., unless it has been determined that the effective quantity is significantly different from the actual quantity. It does not include such substances as white phosphorous, smoke or incendiary compositions unless these substances contribute significantly to the dominant hazard of the hazard division concerned.

Operating Level of Supply
The quantities of supplies and materiel required to sustain operations in the interval between replenishment and the arrival of shipments. It is based on a TCC/PCC's established replenishment period.

Potential Explosion Site (PES)

The location of a quantity of explosives that will create a blast, fragment, thermal or debris hazard in the event of an explosion of its content.

Propellant
Deflagrating (burning rapidly emitting intense heat and sparks) explosive used for propulsion.
A substance that is used to move an object by applying a motive force. This may or may not involve some form of chemical reaction. It may be a gas, liquid, or, before the chemical reaction, a solid. Chemical propellants are most usually used to project ammunition warheads. A substance on its own or in a mixture with other substances that can be used for the chemical generation of gases at the controlled rates required for propulsive purposes.

Pyrotechnic
A device or material that can be ignited to produce light, smoke or noise.

Risk
Combination of the probability of occurrence of harm and the severity of that harm.

Safeguarding
A consultative procedure with the appropriate local authority whereby safeguarded areas outside boundary fences are established for each explosive establishment.

Safety
The reduction of risk to a tolerable level. Degree of freedom from unacceptable risk.

Safety Level of Supply (Ammunition)
The quantity of ammunition, in addition to the operating level of supply, required to be on hand to permit continuous operations in the event of minor interruption of normal replenishment or unpredictable fluctuations in demand.

Security
The result of measures taken to prevent entry by unauthorized persons into explosive storage areas, theft of explosive ordnance and acts of malfeasance, such as sabotage.

Shelf Life / Service Life
Time period for which an explosive or device can be stored or maintained under specific conditions before use or disposal without becoming unsafe or failing to meet specified performance criteria.
The length of time an item of ammunition may be stored before the performance of that ammunition may degrade.

Small Arms
Any single-man-portable lethal weapon designed for individual use that expels or launches, is designed to expel or launch, or may be readily converted to expel or launch a shot, bullet or projectile by the action of an explosive. Includes, amongst other things, revolvers and self-loading pistols, rifles and carbines, submachine guns, assault rifles and light machine guns, as well as their parts, components and ammunition. Excludes antique small arms and their replicas.

Standard
A standard is a documented agreement containing technical specifications or other precise criteria to be used consistently as rules, guidelines, or definitions of characteristics to ensure that materials, products, processes and services are fit for their purpose.

Standing Operating Procedure (SOP)
Instruction that defines the required or currently established method of conducting an operational task or activity.

Surveillance
A systematic method of evaluating the properties, characteristics and performance capabilities of ammunition throughout its life cycle in order to assess the reliability, safety and operational effectiveness of stocks and to provide data in support of life reassessment. The constant review of accumulating test results to ensure that the overall quality remains acceptable. The term is also applied to the continuing examination of the stores themselves.

Weapon
Anything used, designed or intended for use in causing death or injury or for the purposes of threatening or intimidating any person.

ANNEX O

References

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- 01 – Introduction and Principles of Ammunition Management
- 02 – Risk Management
- 03 – Ammunition Accounting
- 04 – Explosive Facilities (Storage) (Field and Temporary Conditions)
- 05 – Explosives Facilities (Storage) (Infrastructure and Equipment)
- 06 – Explosive Facilities (Storage) (Operations)
- 07 – Ammunition Processing
- 08 – Transport of Ammunition
- 09 – Security of Ammunition
- 10 – Ammunition Demilitarization and Destruction
- 11 – Ammunition Accidents, Reporting and Investigation
- 12 – Ammunition Operational Support

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