

DEPARTMENT OF PEACEKEEPING  
OPERATIONS

DISARMAMENT, DEMOBILISATION AND  
REINTEGRATION OF EX-COMBATANTS IN A  
PEACEKEEPING ENVIRONMENT

REVISED

PRINCIPLES AND GUIDELINES  
FOR THE COLLECTION AND DESTRUCTION  
OF AMMUNITION

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# Department of Peacekeeping Operations

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Secretariat Building  
United Nations Headquarters  
New York, New York, 10017 USA

These Revised Principles and Guidelines are concerned with the safe collection and destruction of ammunition<sup>1</sup> in peacekeeping missions, particularly during Disarmament, Demobilisation and Reintegration programmes.

I commend this important work to the attention of all colleagues involved in these activities.

Jean-Marie Guehenno  
Under-Secretary-General  
Department of Peacekeeping Operations

September 2002

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<sup>1</sup> Throughout these guidelines, the term “ammunition” is taken to include: ammunition, explosive ordnance, explosives, including demolition explosives and practice ammunition – see “Acronyms and Definitions Used in These revised principles and guidelines” on page 11. Note, ammunition” may include depleted uranium and some chemical ammunition.

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## CHANGE RECORD

Amendment/Revision Number	Date Amended/Revised	Signature of Person Amending/Revising

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## **PREFACE**

The primary object of these Revised Principles and Guidelines is to issue revised safety principles for the collection and destruction of ammunition during DDR programmes in peacekeeping missions.

The safety principles herein are for all peacekeeping missions involved in planning and executing DDR programmes. The Revised Principles and Guidelines also allow missions to develop detailed mission Standing Operating Procedures (SOPs) and instructions relating to the collection and destruction of DDR ammunition.

These Revised Principles and Guidelines are issued separately to the “*Department of Peacekeeping Operations Disarmament, Demobilisation and Reintegration of Ex-combatants in a Peacekeeping Environment – Principles and Guidelines, Lessons Learned Unit, Department of Peacekeeping Operations, United Nations, December 1999*”.

Disarmament Site SOPs and Instructions, and resolute Command and Control (C<sup>2</sup>) systems and procedures, and the application of accepted safety criteria are critical to manage and reduce the hazard risks associated with the collection and destruction of ammunition.

Additionally, EOD personnel undertaking EOD tasks must be familiar with and qualified to conduct render safe procedures (RSP) and/or to destroy the various natures and types of collected ammunition. Whenever ammunition cannot be positively identified, or its composition is not generally encountered (e.g., ammunition containing liquid propellants), missions should review the appropriate Technical Note for Mine Action (TNMA)<sup>2</sup> or seek the advice of DPKO/Mine Action Service (MAS).

These Revised Principles and Guidelines, replace the ammunition collection and destruction (disposal) related content in:

- Department of Peacekeeping Operations Disarmament, Demobilisation and Reintegration of Ex-combatants in a Peacekeeping Environment – Principles and Guidelines, Lessons Learned Unit, Department of Peacekeeping Operations, United Nations, December 1999, including:
  - “Executive Summary”, page 8, second dot-point “After the collection . . . . for the circumstances”;
  - Section 4 II. “Assembly and Disarmament”, paragraph 82; and
  - Annex C “Guide to Weapons Destruction Methodologies”, paragraph 17 and Section B “Ammunition and Explosives”, paragraphs 20 - 25.

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<sup>2</sup> TNMAs are found on the website: <http://www.mineactionstandards.org/>.

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## **REVISED PRINCIPLES AND GUIDELINES**

### **FOR THE COLLECTION AND DESTRUCTION OF AMMUNITION**

#### **References:**

- A. Department of Disarmament Affairs. A Destruction Handbook – small arms, light weapons, ammunition and explosives. United Nations. July 2001.
- B. Safe and Efficient Small Arms Collection and Destruction Programmes: A Proposal for Practical Technical Measures. United Nations Development Programme. July 2001.
- C. Department of Peacekeeping Operations Disarmament, Demobilisation and Reintegration of Ex-combatants in a Peacekeeping Environment – Principles and Guidelines, Lessons Learned Unit, Department of Peacekeeping Operations, United Nations, December 1999.
- D. Medical Support Manual for United Nations Peacekeeping Operations, as amended.

**The primary principle is that safe destruction should be the overriding objective in operations designed to reduce or eliminate ammunition collected or rendered surplus for whatever reason – Reference A, paragraph 1.4, page 4.**

#### **ACRONYMS AND DEFINITIONS**

Acronyms and definitions used for DDR ammunition collection and destruction programmes are those contained in Reference A. Additional acronyms and definitions used throughout these Revised Principles and Guidelines are at Annex A.

#### **INTRODUCTION**

These Revised Principles and Guidelines address only matters relating to ammunition collected under DDR programmes<sup>3</sup>. Associated DDR activities, such as security of the DDR participants, the overall DDR process, and administration and logistic requirements are not addressed unless they directly impinge on safe ammunition collection and destruction.

Additionally, detailed guidance for unserviceable contingent and UNOE ammunition that must be destroyed for safety reasons and ammunition collected or reported to UN Forces outside DDR programmes are not addressed in these Revised Principles and

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<sup>3</sup> These Revised Principles and Guidelines for the collection and destruction of ammunition, apply equally to similar programmes in Peacekeeping Missions, such as Community Arms Collection and Destruction Programs.

Guidelines. Procedures to manage this ammunition are generally contained in the Draft UN Ammunition and Explosives Regulations Manual 1998 and the Operational Support Manual (Provisional) 1996.

By necessity, some of the content of these Revised Principles and Guidelines are specialised in nature, particularly relating to the siting and operation of ammunition disposal areas. This specialised/technical content is aimed primarily at ATOs/ATs responsible for the technical aspects of siting ammunition disposal areas and the ammunition safety aspects of Disarmament Sites; whose duties also concern the provision of related technical advice to their respective Commanders, and, in DDR programmes, to EOD Teams, EOD specialists and the OIC Disarmament Site.

## **EXCLUSIONS**

### **Stockpile Destruction**

The destruction of large stockpiles of ammunition, including stockpiles of landmines, is not addressed in these Revised Principles and Guidelines.

Guidelines that establish principles and provide guidance for effective national planning and management of stockpile destruction operations are contained in International Mine Action Standard<sup>4</sup> (IMAS) 11.30 “National planning guidelines for stockpile destruction”, as amended<sup>5</sup>. Guidelines for the implementation of a system for the monitoring of stockpile destruction programmes are contained in IMAS 07.42 “Monitoring of stockpile destruction programmes”, as amended<sup>6</sup>. Similarly, guidelines for the destruction of national stockpiles of anti-personnel mines are contained in IMAS 11.10 “Guide for the destruction of stockpiled anti-personnel mines”, as amended<sup>7</sup>.

### **Dumping at Sea**

In consultation with the Office for the London Convention, which is the Secretariat of the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters (London Convention 1972) and the United Nations organisation with the competence regarding matters relating to dumping of wastes at sea, the Division for Ocean Affairs and the Law of the Sea (DOALOS), Office of Legal Affairs (OLA), advises:

- “That dumping at sea of ammunition should not be pursued, given the United Nations role in promoting the protection of the marine environment”.

According to OLA, this approach is substantiated by the legal regime governing the prevention, reduction and control of pollution of the marine environment by dumping set forth in the United Nations Convention on the Law of the Sea and by the detailed

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<sup>4</sup> IMAS are found on the website: <http://www.mineactionstandards.org>

<sup>5</sup> Current version is First Edition (2001-10-01).

<sup>6</sup> Current version is First Edition (2001-10-01).

<sup>7</sup> Current version is First Edition (2001-10-01).



global rules and standards for the prevention, reduction and control of such pollution contained in the London Convention 1972 and its 1996 Protocol.

Accordingly, the dumping of ammunition at sea is not allowed.

### **GENERAL**

Budgetary, political and operational considerations and demands may require divergence from the safety principles outlined in these Revised Principles and Guidelines. Any divergence can only be acceptable if a waiver is issued at the highest levels in the mission – the Head of Mission or Force Commander<sup>8</sup> - after consideration of all relevant factors, including pertinent ammunition safety and technical advice.

Ideally, issuing of a waiver should be delegated to the lowest command level possible, i.e., The OIC Disarmament Site or Sector Commander. However, given the:

- Sensitive nature of any DDR programme;
- Potential hazard risk to mission staff, host State nationals and associated property; and
- Possible requirement for additional resources, such as personnel and equipment, to obviate the need for any waiver means that it is incumbent upon the appointment/person at the appropriate level who controls those resources to grant the waiver.

Accordingly, either the Head of Mission or Force Commander shall be appointed the waiver authority.

Annex B “WAIVERS TO MANDATORY SAFETY REQUIREMENTS on page 16, details the waiver process.

### **General Safety Concerns**

No ammunition safety-procedure or precaution, specialist or soldier training, or any other process or procedure, can give an assurance of absolute safety. The best that can be achieved is to reduce the likelihood of an accidental explosion or fire by applying effective C<sup>2</sup> systems and procedures; and, in the event there is an accidental fire or explosion, previously applied criteria<sup>9</sup> to reduce the likely consequences. Effective C<sup>2</sup> systems and procedures means:

- Effective and resolute Disarmament Site C<sup>2</sup>;
- Controlling access to the demolition ground so that crowding together of persons carrying/placing ammunition in the demolition pits does not occur;
- Applying established EOD and demolition procedures;
- On-site ATO/AT and EOD Team(s);

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<sup>8</sup> Force Commander, means the officer, appointed under the authority of the Secretary-General, responsible for all military operations within the mission (COE Manual Definitions).

<sup>9</sup> This means enforcing horizontal and vertical safety distances between the demolition ground and the Disarmament Site, personnel, property and aircraft/air space.

- Suitably-sized and available containers of water for the complete immersion of any leaking WP ammunition;
- Strict adherence to all safety requirements;
- Informed and aware Disarmament Site participants;
- Effective and practiced emergency procedures and actions in the event of a fire or accident, including readily available first aid;
- Enforcing the “NO SMOKING” rule; and
- The application of common sense by all Disarmament Site participants.

Collection of ammunition under DDR presents a high hazard risk to participants and combatants and may place at risk other persons and property. Inevitably, ammunition collected under DDR will be a mix of all natures and types of ammunition; including high explosive; chemical, WP, smoke and gas (e.g., CS Grenades); serviceable, misfired, UXO, ammunition of known or unknown origin, with or without its integral safety devices (e.g., safety pins) and, usually in a variety of indeterminable conditions. Some ammunition will be in a highly dangerous condition and therefore require special handling and disposal consideration by ATOs/ATs and EOD personnel.

While accepting that DDR ammunition collection carries a high hazard risk to participants, property and others, it is still incumbent on the organisation and Missions in particular, to recognise and manage all the associated hazard risks and to take sensible steps to reduce them as far as is practicable. Accordingly, the allocation of sufficient resources, such as ammunition technical specialists – ATO/AT and equipped EOD Teams; first aid support; ammunition safety training, preparation of Disarmament Site SOPs and instructions; resolute C<sup>2</sup> systems and procedures, and the application of accepted safety criteria are critical to manage and reduce the hazard risks.

The nominated Disarmament Site ATO/AT, or, in the absence of the Disarmament Site ATO/AT, the senior EOD Team member, is the sole authority to determine whether any item of ammunition is “safe” or “unsafe”.

### **Department of Disarmament Affairs - A Destruction Handbook (Reference A)**

Reference A is aimed primarily at post-conflict situations and is a handy field reference guide to the various methods that may be employed in the destruction of small arms and light weapons and their associated ammunition natures.

Reference A suggests that SAA can be disposed of by firing, a choice that may be the safest and most cost effective option. However, the:

- Uncertainty of the SAA’s serviceability and hence its safety;
- High resource costs, especially manpower required to execute this method;
- Management and control of a firing area with its requisite safety templates; and
- Necessary post-firing clean-up, may
- Render this as an unattractive option.

An alternative method for the destruction of SAA, developed by UNAMSIL during their DDR program, rather than the large-scale burning destruction method for SAA as detailed in Reference A<sup>10</sup> is available from DPKO/MAS.

**United Nations Development Programme - Safe and Efficient Small Arms Collection and Destruction Programmes: A Proposal for Practical Technical Measures (Reference B)**

Reference B is a study that “attempts to analyze small arms collection and disposal programmes, from conception to execution, to ensure maximum effectiveness and safety”<sup>11</sup>. The study suggests that a formal risk assessment should be conducted prior to micro-disarmament in order to ensure the safest possible working environment<sup>12</sup> and provides useful information and suggestions on “The Media Awareness Dichotomy”<sup>13</sup>, “Explosives Safety”<sup>14</sup>, “Re-active Measures Performance Indicators”<sup>15</sup>, “Information Gathering” “The Collection Plan”<sup>16</sup> and a practical section on “Quality Policy”<sup>17</sup>.

Reference B further addresses ammunition and explosives safety measures and recommends an operationally proven and safe technical methodology for use on all future micro-disarmament operations. The methodology proposed for the collection and eventual destruction of ammunition and explosives is “a proper demolition ground should be sited near every weapons/ammunition collection point [i.e. Disarmament Site] to enable the immediate destruction of any unsafe or unstable ammunition or explosives that are handed in by the local population”<sup>18</sup>. **This safety-oriented methodology for the collection and destruction of ammunition is to be applied in Missions.** However, the study infers that “safe” and “stable” ammunition and explosives are transported to storage areas for eventual disposal. Regardless of the available level of ammunition technical expertise, not all “unsafe” or “unstable”

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<sup>10</sup> Department of Disarmament Affairs. A Destruction Handbook – small arms, light weapons, ammunition and explosives. United Nations. July 2001. Procedure 3, paragraph 3.2.3, page 30.

<sup>11</sup> Safe and Efficient Small Arms Collection and Destruction Programmes: A Proposal for Practical Technical Measures. United Nations Development Programme. July 2001. Letter from Omar Bakhet, UNDP Emergency Response Division, New York, 1 July 2002, page 3.

<sup>12</sup> Ibid. Page 17 “Risks and Hazards”.

<sup>13</sup> Ibid. Page 17.

<sup>14</sup> Ibid. Page 18.

<sup>15</sup> Ibid. Page 25.

<sup>16</sup> Ibid. Page 31.

<sup>17</sup> Ibid. Page 34.

<sup>18</sup> Ibid Page 20.

ammunition may be recognised as such and hence, “unsafe” and/or “unstable” ammunition and explosives may inadvertently be subjected to transport and storage.

Nevertheless, the transport of ammunition requires the application of International standards, as defined in *Transport of Dangerous Goods Manual for United Nations Peacekeeping Operations* dated 25 June 2001, including the classification of the ammunition (UN Serial Number and Hazard Classification Codes – HCC). For storage, explosion danger-separation areas for all magazines must be applied.

Given the likely condition of collected ammunition, identifying, then classifying it for transportation is not practicable and establishing the required danger-separation distances from magazines to nearby magazines and other exposed sites may be cost-prohibitive. Apart from the inherent safety-concerns with DDR-collected ammunition, the requisite transport and storage requirements are likely to exacerbate a Mission’s budget and resource requirements.

To reduce the transport and storage requirements, collected ammunition should be destroyed as close to the collection site(s) as soon as possible.

### **Urban Ammunition Disposal Areas**

Reference C states, in part: “Accessible, well-protected weapons collection sites should be established in rural as well as urban areas in an effort to reach as much of the armed public as possible”<sup>19</sup>.

If ammunition is also returned to “weapons collection” [i.e., Disarmament] sites, which is likely to occur in future DDR ammunition collection programmes, weapons collection sites in urban areas are likely to cause problems in siting close by demolition grounds. Accordingly, where the requisite safety distances for demolition grounds cannot be met in urban areas, including consideration of using parks and open spaces, there is no option to transporting collected ammunition to a nearby demolition ground.

Missions need to carefully consider the siting of Disarmament Sites in urban areas and the consequential difficulty of safely siting ammunition disposal (demolition grounds) areas.

### **Destruction of Ammunition in Situ**

A guiding EOD principle is that all ammunition that is considered “unsafe” should be destroyed or rendered safe using RSP, *in situ*, particularly when in not all “DDR” ammunition may necessarily be recognised as being “unsafe”.

In a DDR setting, while the guiding principle of destroying or rendering safe *in situ*, should be applied, politically unacceptable delays in the DDR programme may occur and the number of EOD Teams, their required mobility, specialist tools and equipment will increase, perhaps dramatically. Unacceptable delays could result from the time taken by EOD Teams to visit each UXO location, perhaps in a combatant’s remote village or camp location, and perform RSP or destruction techniques. Combatants may quickly learn that rather than carry [heavy] ammunition to the Disarmament Site,

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<sup>19</sup> Disarmament, Demobilisation and Reintegration of Ex-Combatants in a Peacekeeping Environment – Principles and Guidelines. Lessons Learned Unit, United Nations Department of Peacekeeping Operations. December 1999. Paragraph 140, “Location of Sites”, page 69.

they only need to advise of “unsafe” ammunition, for an EOD Team to visit and deal with the problem.

Whenever RSP/EOD of “unsafe” ammunition is required, previously determined RSP/EOD for the “unsafe” ammunition shall apply. Where RSP/EOD techniques cannot be determined, the advice of DPKO/MAS is to be sought.

### **Depleted Uranium (DU) Ammunition**

Wherever DU ammunition is likely to be encountered, special disposal methods are to be implemented. These measures should include the employment of specialist consultants to undertake DU disposal and site remediation. Any clean up of DU fragments is to be according to Technical Note for Mine Action (TNMA) 09.30/02 “Clearance of Depleted Uranium (DU) hazards”<sup>20</sup>.

DU ammunition cores and fragments are stored awaiting removal by a specialist hazardous and radiological waste disposal company, according to TNMA 09.30 /02<sup>20</sup>.

## **DDR AMMUNITION COLLECTION AND DESTRUCTION (DISPOSAL) OPERATIONS**

### **IN-MISSION PLANNING PHASE**

A technical assessment is to be undertaken by the Mission and participation by qualified ATOs/ATs, or commercial companies specialising in the disposal of ammunition, is essential.

Identification lists of all ammunition and explosives likely to be encountered, including their EOD and RSP techniques, are to be prepared and promulgated to Mission DDR participants (ATO/AT, EOD and DDR Teams) and trainers. DPKO/MAS has access to data, such as “ORDATA II – Enhanced International Deminers’ Guide to UXO Identification, Recovery and Disposal” to assist in ammunition identification and RSP/EOD techniques, which can be made available to Missions for their use when preparing ammunition identification lists.

Other considerations aside, the technical assessment is important to determine the level of required resources and the necessary expertise of ammunition specialist personnel – ATOs/ATs and EOD personnel (EOD personnel undertaking EOD tasks must be familiar with and qualified to conduct RSP and/or destroy the various natures and types of collected ammunition).

Sufficient correctly equipped EOD Teams, either military or civilian, should deploy to the mission for the duration of the DDR programme, arriving during the planning phase and repatriating on its completion. However, sufficient EOD Teams should remain in mission for any follow-on Community Arms Collection and Destruction (CACD) programme or similar. EOD Teams should have the capability (qualifications,

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<sup>20</sup> Current version is Version 1.0. Other TNMAs are found on the website:  
<http://www.mineactionstandards.org>.

tools, protective clothing and equipment) and mobility to go to any location and undertake *in situ* RSP/EOD, when required.

Each DDR programme must address how “unsafe” ammunition will be dealt with. The choices are to conduct RSP or destroy *in situ*; have combatants carry the ammunition, regardless of its condition to the Disarmament Site and then, under control, to the ammunition disposal (demolition ground) area, or a combination or partial combination of these.

Awareness training for MILOBs and others in the safe handling of ammunition should be conducted by certified ammunition specialists and coordinated by the Mission Training Cell (MTC).

Missions are to prepare and issue Standing Operating Procedures (SOPs), including Safety Instructions for the collection and disposal of ammunition and explosives at Disarmament Sites, first aid and medical and fire fighting/fire precautions.

### **EXECUTION PHASE**

Based on data gathered throughout the DDR programme, the ammunition identification list should be updated and frequently promulgated to all ATO/AT, EOD and DDR Teams.

ATO/AT and two-person EOD Teams, or representatives from contracted commercial companies specialising in the disposal of ammunition, are required to deploy as an integral element of each Disarmament Site.

As a guiding principle, all non-SAA ammunition should be taken to a licensed ammunition disposal area by combatants before they enter the Disarmament Site and destroyed as soon as possible, ideally daily, without transporting and storing the collected ammunition awaiting its disposal. Where it is not possible to destroy non-SAA daily, then a suitable guard needs to be placed at the non-SAA site until the ammunition is destroyed.

SAA may be collected and transported to storage to await disposal by burning.

Note that DU ammunition requires separate disposal considerations.

Ideally, Disarmament Sites should be sited and operated to allow the destruction each day by demolition, of all non-small arms ammunition (SAA). **All unsafe ammunition should also be destroyed each day, regardless of protocol.** Daily destruction of non-SAA collected ammunition dramatically reduces the hazard risk to personnel and property by eliminating the transport of collected ammunition and explosives and its subsequent “double-handling” and storage, while awaiting eventual disposal. Whenever the collected ammunition (non-SAA) cannot be destroyed the same day, a guard force must secure the demolition site overnight, or until demolition activities recommence.

To reduce the hazard risk to personnel, ammunition disposal areas are to be sited and operated according to the criteria in Annex C “Ammunition disposal areas” on page 20. Only in the most extraordinary and exceptional circumstances, **and then only when waived prior by the Force Commander or CMO as appropriate**, should collected ammunition, other than SAA, be transported by any vehicle to either storage sites to await disposal, or to a more remote demolition ground.

SAA and only SAA are to be transported from the Disarmament Site(s) to suitable storage sites to await subsequent disposal by burning.

Those who bring the ammunition and explosives to the Disarmament Site, before their processing, should carry non-SAA to the previously prepared demolition site, under the supervision of DDR personnel. Further, to reduce the risk to personnel:

- More than one demolition pit should be prepared to reduce the quantity of ammunition and explosives in each pit - EOD Teams will require assistance in digging pits, filling sandbags, etc.
- Combatants with ammunition should be intercepted before entering the actual Disarmament Site and their progress strictly controlled until the ammunition is placed in a nominated demolition pit at the ammunition disposal area.

A schematic layout of a Disarmament Site is at Annex E.

### **Environmental Concerns**

General guidance and advice for sound environmental management is contained in TNMA 10.10/01 “Environmental management during mine and UXO clearance operations”, as amended<sup>21</sup>.

### **USER HANDBOOK**

PBPU, as the DPKO focal point for DDR and DDR related issues, shall develop and promulgate a user handbook at a later stage, when they have the resources to do so, consistent with the content of these guidelines.

Pending the issuance of the user handbook, PBPU is preparing a pocket-sized card, which provides a safety guide for ammunition and explosives safety for all peacekeeping personnel: United Nations staff, UN Volunteers, Military Observers, Contingent members, and others, who may be involved in the operation of a disarmament site.

### **IN MISSION TRAINING**

MD DPKO shall facilitate awareness training for MILOBs and others in the safe handling of ammunition, which should be conducted by certified ammunition specialists and coordinated by the Mission Training Cell (MTC).

### **FIRST AID AND MEDICAL**

Annex F “First Aid and Medical”, on page 29, contains relevant information on first aid and medical, including the treatment of WP burns.

### **FIRE PROTECTION AND SUPPRESSION**

Consideration must be given to the prevailing climate and weather conditions and resultant fire risk, including the amount of available natural fuel (trees, shrub, undergrowth) that may feed any fire emanating from disposal operations.

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<sup>21</sup> Current version is Version 1.0.

Missions shall expand their Mission Fire Orders to address fire safety during DDR ammunition collection and destruction.

### **PERSONAL PROTECTIVE EQUIPMENT**

Minimum requirements for personal protective equipment, including protective clothing shall be according to IMAS 10.30 “Personal protective equipment”, as amended<sup>22</sup>.

### **ANNEXES AND ATTACHMENTS:**

- A. Acronyms and Definitions
- B. Waivers To Mandatory Safety Requirements  
Attachment: 1. Register of Approved Waivers
- C. Ammunition Disposal Areas  
Attachment: 1. Ammunition Disposal Area - Explosives Limit Licence
- D. First Aid and Medical
- E. Schematic Layout –Disarmament Site

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<sup>22</sup> Current version is First Edition (2001-10-01).



ANNEX A TO  
DDR AMMUNITION COLLECTION AND DESTRUCTION  
REVISED PRINCIPLES AND GUIDELINES

**ACRONYMS AND DEFINITIONS USED IN THESE REVISED PRINCIPLES  
AND GUIDELINES**

**Ammunition.** A complete device charged with explosives, propellants, pyrotechnics, initiating composition, or chemical material for use in military, police, mining, EOD, and IED operations, including demolitions.

- **Note:** The term “ammunition” is used in these Revised Principles and Guidelines rather than “Explosive Ordnance” or other similar terms, to remain consistent with accepted UN terminology, such as that used in IMAS and the COE Manual<sup>23</sup>, which uses either “ammunition” or “ammunition and explosives”.
- Ammunition includes all munitions containing explosives and chemical agents: this includes bombs and warheads; guided and ballistic missiles; artillery, mortar, rocket, grenades and small arms ammunition. All sea-mines, torpedoes, and depth charges; land mines; demolition charges; pyrotechnics; clusters and dispensers; cartridge and propellant actuated devices; electro-explosive devices; clandestine and improvised explosive devices; and all similar or related items or components explosive in nature. Ammunition includes all explosives.

**Ammunition Disposal Area.** An area authorised for the destruction of ammunition and explosives by detonation and burning.

See “Burning Ground” and “Demolition Ground”.

**AT (Ammunition Technician).** A non-commissioned officer who has qualified at a specialist long-term technical ammunition course of at least six months duration.

**ATO (Ammunition Technical Officer).** A commissioned officer, qualified at a specialist long-term technical ammunition course of at least six months duration.

**AUW (ALL UP Weight).** All up weight of the ammunition being destroyed plus the demolition charge(s).

**Burning Ground.** An area authorised for the destruction of ammunition and explosives by burning.

An element of an ammunition disposal area. A burning ground is a delineated area used for the disposal of ammunition by fire. Fires may be in the open, in burning pits or in specially constructed incinerators. All burning grounds are to be licensed for that purpose.

**C<sup>2</sup>.** Command and Control. The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement

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<sup>23</sup> Manual on Policies and Procedures Concerning Reimbursement and Control of Contingent Owned Equipment of Troop-Contributors Participating in Peacekeeping Operations – (COE Manual), as amended.

of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission.

**CACD.** Community Arms Collection and Destruction Programme.

**CMO.** Chief Military Observer.

**CO.** Commanding Officer.

**Compatibility Group (CG).** Ammunition is assigned to one of the thirteen compatibility groups (CGs) based on their characteristics and associated hazards to regulate the conditions under which they are handled, stored and transported.

**DDR.** Disarmament, Demobilisation and Reintegration.

**DDR Principles and Guidelines.** Disarmament, Demobilisation and Reintegration of Ex-Combatants in a Peacekeeping Environment – Principles and Guidelines. Lessons Learned Unit, United Nations Department of Peacekeeping Operations. December 1999.

**Demolition Ground.** An area authorised for the destruction of ammunition and explosives by detonation.

An element of an ammunition disposal area. A demolition ground is a well-delineated area used for the disposal of ammunition by explosive detonation. Demolitions may be on an open surface, behind screening traverses, in pits, or buried. All demolition grounds are to be licensed for that purpose.

**Depleted Uranium (DU) Ammunition.** Ammunition containing depleted uranium (DU) has been developed as an improved armour-piercing weapon, mainly for anti-tank warfare. A round of DU ammunition may consist of a DU penetrator made of DU metal (or of a DU alloy), a tracer element and a propellant charge that may be integral with the penetrator or loaded into the gun separately. The use of DU in armour piercing ammunition exploits the high density of the metal which, when propelled at high velocity, results in the delivery of sufficient kinetic energy to effect hydrodynamic penetration. The penetration is accompanied by disintegration of the projectile and a violent combustion of the fragments thus formed. DU is slightly radioactive and, if ingested or inhaled, has a similar chemical toxicity to lead. DU is not a fissile material and cannot be used in the absence of fissile material to construct a nuclear weapon. Therefore, DU ammunition is in no sense, and cannot be described as, a nuclear weapon, a radiological weapon, a chemical weapon or a weapon of mass destruction.

**Destroy (Destruction) in Situ.** The destruction of any item of ammunition by explosives without moving the item from where it was found, normally by placing an explosive charge alongside.

**Disarmament Site/Disarmament Reception Centre.** A transit location where weapon registration and weapon and ammunition collection is conducted. A suggested schematic layout is at Attachment 1 to these Revised Principles and Guidelines.

**Explosive Ordnance.** See “Ammunition”.

**EOD (Explosive Ordnance Disposal).** For DDR programmes, EOD is defined as:

- The detection, identification, [on-site] evaluation, render-safe, recovery, and final disposal of all ammunition, including serviceable, unserviceable, “unsafe”, unexploded ammunition (UXO) and ammunition that has become hazardous by damage or deterioration. EOD is undertaken as a routine part of DDR programmes.

**EOD Team.** A two-person team, either military or civilian, that undertakes EOD, qualified to Level 2 EOD Standard, ideally Level 3, according to IMAS 09.30 “Explosive ordnance disposal”, as amended<sup>24</sup>.

**ES.** See Exposed Site.

**Exposed Site (ES).** An exposed site is any location, facility or vehicle which is exposed to the possible effects of an explosion, or fire, at the ammunition disposal area under consideration, and which requires protection from the effects of that explosion or fire. Examples of an exposed site are a magazine, cell, stack, truck or trailer loaded with ammunition, inhabited building (such as, offices, accommodation buildings, dining facilities, including Host-state inhabited buildings, such as houses, schools, work places, offices, etc), places where people assemble, such as a sports oval, or public traffic route (footpath, road, rail, canal, river, etc).

**Form 001.** NCDDR Ex-Combatant Disarmament Form prepared according to Annex B1 to the DDR Principles and Guidelines (Reference C) - a three-page self-carbon Form.

**Form 002.** NCDDR Ex-Combatant Demobilisation Form prepared according to Annex B2 to the DDR Principles and Guidelines (Reference C) - a two-page self-carbon Form.

**Hazard Classification Code (HCC).** An alphanumeric code, formed from the Hazard Division (HD) and Compatibility Group (CG) of a certain type of ammunition to form a three-character code (E.g. 1.4C, 1.1D).

**Hazard Division (HD).** In accord with the UN “Recommendations on the Transport of Dangerous Goods”, ammunition, **that is deemed not too dangerous to be accepted for transport**, is categorised as Dangerous Goods Class 1. This class is divided into six hazard divisions according to the type of hazard they present. The four hazard divisions likely to be encountered in Missions and their primary hazard are as follows:

- **Hazard Division (HD) 1.1.** Ammunition that has a mass explosion hazard, e.g., demolition explosives, aircraft bombs. The explosion will produce severe structural damage to surrounding buildings in the immediate neighbourhood, the severity being determined by the amount of explosives involved and the distance of the buildings from the explosion site. Blast and high-speed fragments are the major hazards although there may be a danger from heavy debris propelled from the structure in which the explosion occurs.
- **Hazard Division (HD) 1.2.** Ammunition, which has a projection hazard, but not a mass explosion hazard, e.g., some artillery rounds. The explosion will result in items burning and exploding progressively a few at a time. Fragments, firebrands and unexploded items may be projected in considerable numbers; some of these may

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<sup>24</sup>

Current version is First Edition (2001-10-01).

explode on impact and propagate fire or explosion. Blast effects will be limited to the immediate vicinity of the explosion site.

- **Hazard Division (HD) 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, e.g., some pyrotechnics.
- **Hazard Division (HD) 1.4.** Ammunition that presents no significant hazard, e.g., SAA. Ammunition included in this division is primarily a moderate fire hazard. It will not contribute excessively to the fire. The effects are largely confined to the package; however, the external fire may cause a package to be degraded such that it cannot contain the effects of the ammunition. No fragments of appreciable size or range are to be expected. An external fire will not cause a mass explosion of the total contents of the package when there are a number of items in the package.

**IMAS.** International Mine Action Standard, available from <http://www.mineactionstandards.org>

**MILOBs.** Military Observers.

**NEC (Net Explosive Content)/Net Explosive Quantity (NEQ).** Net explosive content is the content, in kilograms, of the explosive substances present in ammunition, unless it has been determined that the effective content is significantly different from the actual content. The net explosive content does not include such substances as white phosphorous, gases, smoke or incendiary compositions, unless these substances contribute significantly to the dominant hazard of the Hazard Division concerned.

**NCDDR.** National Committee on Disarmament, Demobilisation and Reintegration.

**OC.** Officer Commanding.

**OIC.** Officer-in-charge.

**ORDATA.** A publication prepared by the United States Department of Defence, available in CD-ROM that provides guidance on the identification, recovery and disposal of UXO.

**PKO.** Peacekeeping Operations.

**RSP (Render safe procedure).** The application of special EOD methods and tools to provide for the interruption of functions or separation of essential components to prevent an unacceptable detonation.

**SAA (Small Arms Ammunition).** All ammunition for small arms, up to and including 20 mm calibre.

**SOP.** See Standing Operating Procedure.

**Standing Operating Procedure.** Also called SOP.

Usually a direct communication from supervisor to subordinates and whose application is strictly limited to the immediate task, or series of tasks to be performed exactly the same way regardless of location or circumstance.

A set of instructions covering those features of operations and processes that lends themselves to a definite or standardised procedure without loss of effectiveness. The procedure remains applicable unless ordered otherwise.

An SOP:

- Provides people with all the safety, health, and environmental and operational information necessary to perform a job properly;
- Ensures that no failures occur that would harm anyone in the surrounding community;
- Ensures that approved procedures are followed in compliance with the Organisation's rules, regulations, principles, guidelines, directives and instructions;
- Is a basis for teaching users about the operation and process for which the SOP was written.

**TNMA.** Technical Note for Mine Action, available from <http://www.mineactionstandards.org>

**UNMOs.** United Nations Military Observers.

**Unsafe Ammunition.** Unsafe ammunition includes all:

- UXOs;
- Misfires;
- Fired or unfired ammunition with missing or inoperative safety devices, such as safety pins;
- Heavily corroded ammunition;
- Ammunition that is:
  - Damaged, or has damaged fuses or other components;
  - Leaking any liquid, particularly WP ammunition;
  - Of indeterminable or unknown condition;
  - Unable to be positively identified;
  - "Unstable" for whatever reason; and
  - Considered unsafe by an ATO/AT.

**UXO (Unexploded Ordnance).** Explosive ordnance, i.e., ammunition, that has been primed, fused, armed or otherwise prepared for use or used. It may have been fired, dropped, launched or projected yet remains unexploded either through malfunction or design or for any other reason.

**WP.** White Phosphorous.

ANNEX B TO  
DDR AMMUNITION COLLECTION AND DESTRUCTION  
REVISED PRINCIPLES AND GUIDELINES

## **WAIVERS TO MANDATORY SAFETY REQUIREMENTS**

### **GENERAL**

Occasions may arise, when an Officer Commanding, Commanding Officer, Officer-in-charge, Contingent Commander, DOA/CAO, Police Commissioner, Force Commander; or the nominated Disarmament Site ATO/AT, or the senior EOD Team Member may decide that circumstances warrant the waiver of specific safety principles and guidelines in respect of ammunition storage, transport or handling. A waiver must be authorised because people and property may be exposed to risks greater than those inherent in these Revised Principles and Guidelines. See “APPROVING AUTHORITIES” on page 17 for who can authorise a waiver.

A waiver is an authorisation for the performance of an activity that does not comply, in terms of safety, or risk to people or property, with the safety principles for the transport, storage or handling of ammunition as prescribed. In this regard, non-compliance with fire protection requirements may result in the requirement for a waiver. However, failure to meet any required security requirements because of operational reasons, as determined by the Force Commander/UN Chief Security Officer, does not constitute a requirement for a waiver.

The Force ATO is the technical adviser on all waiver applications and provides recommendations, based on technical considerations, for the acceptance or rejection of any waiver.

DPKO/MAS - OMS/LSD can provide advice on the interpretation of these Revised Principles and Guidelines and technical advice on the need for waivers.

### **CATEGORIES OF WAIVER**

There are two categories of waiver:

- Mission risk waiver (MRW); and
- Non-mission risk waiver (NMRW).

#### **Mission Risk Waiver - MRW**

A MRW is an authorised departure from ammunition safety principles and guidance, which results in a risk to Mission property, and/or to persons employed by the United Nations, including contractors, greater than the risk inherent in applying these safety principles and/or guidance.

#### **Non-mission Risk Waiver - NMRW**

A NMRW is an authorised departure from DPKO ammunition safety principles and guidance, which results in a risk to non-United Nations property and/or persons, other than those employed by the United Nations, greater than the risk inherent in applying these safety principles and/or guidance.

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## **APPROVING AUTHORITIES**

### **MRW**

The Force Commander, or the Chief Military Observer (CMO) if the CMO is the head of the military component, as advised by the Force ATO, is the approving authority for MRW.

Delegation of this authority is not permitted.

### **NMRW**

The Head of Mission, as advised by the Force Commander, is the approving authority for NMRW.

Delegation of this authority is not permitted.

### **Waiver Applications**

MRW and NMRW applications are to be raised and submitted to the approving delegate only after the need for the non-compliant activity has been confirmed. Other options must be considered and investigated beforehand. The actual waiver application must demonstrate that:

- There are no feasible alternatives to seeking a waiver approval,
- Hazards and the scope of the waiver have been reduced as far as practicable, and
- All reasonable future options to remedy the need for a waiver have been identified.

In considering options and alternatives, the application must address the following factors:

- Alternatives that were considered but rejected;
- The consequences of the waiver application not being approved;
- An assessment of the increased hazard involved and likely consequences, including a full disclosure of the aggregate net explosives content (NEC) involved;
- An explanation, including costs and timings, of the measures that are being adopted, or are being considered, to negate the need for the waiver; and
- The duration of the waiver.

### **Application Process**

Applications for MRW are to be submitted direct to the Force Commander, or CMO where appropriate, copy to DOA/CAO; applications for NMRW applications are to be submitted to the Head of Mission through the Force Commander, copy to the DOA/CAO.

### **Operationally Essential Non-Compliant Activities**

Where possible, operationally essential non-compliant activities, as determined by the Force Commander or CMO as appropriate, are to be approved before being undertaken.

### **DURATION OF WAIVERS**

MRW may be approved for a maximum of two months initially. If after two months the non-compliant activity has not been rectified a new waiver application, complete with the full history of the waiver, including the reasons why the problem has not been resolved, must be submitted.

NMRW will normally be sought only for the period assessed as necessary to remedy the non-compliant activity or activities.

### **REPORTING REQUIREMENTS**

The DOA/CAO is to provide to DPKO/LSD (For attention SSS/Supply Section), a return of the status of all DDR related -MRW and -NMRW each month. The return, in the format of attachment 1, is to be submitted by the 10<sup>th</sup> day of the following month.

**Attachment 1:** Register of Approved Waivers



## **REGISTER OF APPROVED WAIVERS**

### **Status of Waivers for the Period Ending:<sup>25</sup>**

**(To Be Completed For Every Waiver That Was Current during the Reporting Period)**

[Expand the form and use additional pages as necessary]

<b>Type of waiver:</b> <b>NMRW/MRW<sup>26</sup></b>		<b>Mission:</b>	<b>Date:</b>
Unit/Contingent and Location:			
Approved by:		Approved until:	
Date last renewed:			
Renewed until:			
Date cancelled:			
Activity authorised:			
Reason for the waiver:			
Proposed remedy:			
Cost to remedy (USD):	\$		
Remedial progress to date:			
Remarks (if any):			
Estimated remedial date:			

<sup>25</sup> Insert DATE.

<sup>26</sup> Delete as appropriate.

ANNEX C TO  
DDR AMMUNITION COLLECTION AND DESTRUCTION  
REVISED PRINCIPLES AND GUIDELINES

## **AMMUNITION DISPOSAL AREAS**

The operation of all ammunition disposal areas must accord to these Revised Principles and Guidelines.

### **BURNING GROUNDS AND DEMOLITION GROUNDS**

This annex contains technical safety requirements for ammunition disposal areas, i.e. burning grounds and demolition grounds.

### **APPLICATION OF INTERNATIONAL MINE ACTION STANDARDS (IMAS) AND TECHNICAL NOTES FOR MINE ACTION (TNMA)**

The content of the following IMAS shall apply to all ammunition disposal area operations:

- IMAS 11.20 “Principles and procedures for open burning and open detonation (OBOD) operations”, as amended<sup>27</sup>.

The estimation of explosion danger areas from all ammunition disposal areas is to be calculated according to:

- TNMA 10.20/01 “Estimation of Explosion Danger Areas”, as amended<sup>28</sup>.

### **ADDITIONAL REQUIREMENTS**

Additional, to the requirements of IMAS 11.20, as amended, and TNMA 10.20/01, as amended, the principles and guidelines contained in the following paragraphs shall apply.

#### **Burning Grounds**

In the selection of burning grounds, areas without ground cover with a hard flat surface, free from rocks and debris, should be chosen. Trees and shrubs should be cleared to at least 30 metres from the site. The burning ground should not be sited below steep cliffs as these may modify air currents causing acceleration in the burn rate. The burning ground is to be of sufficient area to:

- Contain the required safety distances; and
- Where specifically constructed hearths or ovens are not being used, the ammunition that is being burnt must be laid on different ground for each successive burn on any one day.

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<sup>27</sup> Current version is First Edition (2001-10-01).

<sup>28</sup> Current version is Version 2.0.

## **Demolition Grounds**

The area chosen for surface or below-surface demolition of ammunition should be level with deep soil relatively free from rocks and stones and free from undergrowth and trees. These conditions reduce the fire and fragmentation hazards arising from an explosion and enable the easy digging of pits, postholes and undercuts in which to set up demolitions. If below-surface demolitions are used, the use of sandy soil is to be avoided due to the difficulty in digging undercuts.

Demolition grounds must:

- Contain the required safety distances; and
- Be sited, where possible, on high ground to limit blast reflection effects.

**Note a demolition ground may also be required to contain a burning ground (or vice versa). Consequently, the selection criteria for each ground should not be considered in isolation.**

## **ENVIRONMENTAL CONSIDERATIONS**

Particular attention is to be paid to:

- Environmental problems, including the effects of the products of combustion on the food cycle and drinking water;
- The effects of noise and shock;
- The dispersal of toxic or hazardous gases and residue;
- The effect of residue on personnel, nearby facilities, locals and local utilities;
- Subsequent clean-up activities before surrendering the disposal site(s) to host nation authorities.
- Recovery of scrap metals resulting from SAA burns, which should be disposed of according to host nation requirements. Note that the disposal of these recovered scrap metals may require specialist assistance, particularly with regard to lead and other toxic substances.
- Similarly, demolition sites should be cleared to host nation requirements.

General guidance and advice for sound environmental management is contained in TNMA 10.10/01 “Environmental management during mine and UXO clearance operations”, as amended<sup>29</sup>.

## **CONTROL AND COORDINATION OF BURNING GROUNDS AND DEMOLITION GROUNDS – APPOINTMENT OF SAFETY OFFICER**

The Force Commander, or CMO as appropriate, is to appoint the Disarmament Site ATO/AT or EOD Team Leader, in the absence of an ATO/AT, as the Disarmament Site Safety Officer. The Disarmament Site Safety Officer is responsible for all ammunition safety related matters and is to control the burning ground and demolition ground and coordinate their use.

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<sup>29</sup>

Current version is Version 1.0.

## **SITING OF BURNING GROUNDS AND DEMOLITION GROUNDS**

All burning grounds and demolition grounds are to be sited by the Force ATO, who shall include and specify in the Disarmament Site SOPs:

- The disposal procedures approved for use, e.g. surface and pit burning, furnaces, below ground demolitions, and any operational restrictions;
- The maximum allowable net explosives content (NEC) for each authorised disposal procedure;
- Any restrictions applicable to other classes of dangerous goods, such as depleted uranium; and
- Man and equipment limits and/or other restrictions.
- Outcome of consultations with host nation authorities.

## **BURNING OF SAA – AN EFFECTIVE METHOD**

While different methods may be used to destroy SAA by burning, an effective method that can quickly be prepared in Missions, without the need for expensive and static ovens and incinerators<sup>30</sup> is the open pit method. Details on this method are available from DPKO MAS.

## **LICENSING**

All burning and demolition grounds are to be licensed by the Force ATO. The Ammunition Disposal Area - Explosives Limit Licence form, which must be used, is at Appendix 1 to this Annex. The licence is to include and specify:

- The disposal procedures approved for use, e.g. surface burning, furnaces, below ground demolitions, and any operational or other restrictions;
- The maximum allowable net explosives content (NEC) in Kgs, for each authorised disposal procedure and hazard division (HD);
- Any restrictions applicable to other classes of dangerous goods; and
- Man and equipment limits and/or other restrictions.

## **SECURITY**

Burning and demolition grounds are to be sited or constructed so that access can be controlled effectively, ensuring that unauthorised personnel do not enter the designated area during ammunition collection and disposal operations. Controls may include posted sentries, or other approved methods of control. Where burning and demolition grounds are not located within a security fence, the minimum requirement is access-control during ammunition collection and disposal activities.

Locals must be informed of all burning and demolition activities to avoid panic and dangers emanating from the burning/disposal activities.

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<sup>30</sup> Missions should proceed cautiously when considering static purpose-built ovens and incinerators, as the changing circumstances of a DDR programme in a peacekeeping mission may mean that the location of Disarmament Sites change, perhaps placing them at unacceptable distances from any purpose-built oven or incineration.

DDR collected ammunition that is not destroyed on any one day, must be guarded overnight, or until demolition-activities recommence.

### **PROHIBITED/CONTROLLED ARTICLES**

In particular, admission of the following is to be prohibited or strictly controlled:

- Oil or gas filled lighting, heating or burning appliances and all flame spark or fire producing appliances;
- Matches and other portable means of producing spark or flame;
- Radio transmitters and receivers, including mobile telephones and pagers;
- Cigarettes, tobacco in any form, and any article used for the purpose of smoking or carrying tobacco; any beers, wines and alcoholic liquor;
- Motor spirit, flammable oils and solvents not contained in the fuel tank of a vehicle or in a sealed container;
- Drugs and medicines;
- Food and drink;
- Battery operated equipment; and
- Radioactive material, other than DU ammunition when authorised.

The consumption of food and drink is to be strictly controlled inside ammunition disposal areas, and generally should not be permitted except in situations where it is operationally difficult for personnel to leave the area. In these circumstances, the appointed OIC of the demolition and/or burning ground may authorise the consumption of food and non-alcoholic drinks at designated places within the area.

Strict attention is to be paid to personal hygiene. The preparation of food and drink in, or the introduction of alcoholic beverages into any ammunition disposal area is forbidden.

### **Control of vehicles**

Only authorised United Nations and contingent vehicles are normally to be permitted to enter burning grounds and demolition grounds. However, the OIC of the Disarmament Site may exceptionally authorise private or commercial vehicles to enter on a specifically as required basis. Vehicles powered by or carrying liquefied petroleum gas, or with defective exhaust or electrical systems, or with hydraulic, oil or fuel leaks are not to be permitted entry without specific approval.

### **CONDUCT OF DISPOSAL OPERATIONS**

Force Commanders shall ensure that written instructions are prepared and authorised which outline:

- Specific disposal procedures for both burning and demolition operations, including procedures for the disposal of waste materials arising from the operation;

- Control procedures for the conduct of firings, including the need for coordination with the Mission's Air Safety Officer and the Chief Aviation Officer;
- Disposal activity reports, which should be submitted to Force HQ each day at the completion of disposal activities;
- Emergency procedures, including first aid requirements and casualty evacuation procedures;
- Accident/incident reporting;
- Fire precautions and fire fighting procedures;
- Appropriate activity notification procedures, e.g. facility warning procedures, warnings to police, fire stations, neighbours, and the like;
- Area access control, sentry responsibilities and control;
- Communications procedures;
- Vehicle transport procedures and limitations;
- Misfire procedures;
- Safety distance requirements; and
- Area decontamination procedures.

### **CALCULATION OF HAZARD SAFETY DISTANCE ENVELOPES - DISPOSAL OF SAA BY BURNING**

#### **Disposal of SAA by burning in pits**<sup>31</sup>

The following safety criteria and safety distances are to apply:

- Personnel and private property are not to be exposed to a heat radiation intensity exceeding 1.6 kW/m<sup>2</sup>. For SAA, the appropriate safety distance is 200m minimum, with a NEC not to exceed 100 kg. At the safety distance of 200m, the heat radiation is less than 1.6 kW/m<sup>2</sup>.
- Personnel are to be protected by a distance of 200 m minimum.

#### **Disposal by burning of SAA in approved ovens/incinerators:**

- A minimum safety distance of 200 m is to apply, and
- The maximum NEC of the ammunition for disposal by this method is dependent on the capacity of the oven/incinerator, but shall not exceed 100 kg at any one time.

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<sup>31</sup> Unless exceptional circumstances exist, the use of pits, rather than ovens or incinerators is encouraged.

## **CALCULATION OF HAZARD SAFETY DISTANCE ENVELOPES - DISPOSAL OF AMMUNITION BY DEMOLITION ACTIVITIES**<sup>32</sup>

### **Fragmentation Hazard Zone**

#### **Multi-item Demolition Danger Area Estimation**

The calculation of the fragmentation-zone safety-distances for the disposal of multi-items by demolition is according to TNMA 10.20, as amended.

#### **Single-item Demolition Danger Area Estimation**<sup>32</sup>

The calculation of the fragmentation-zone safety-distance for the disposal of single-items of ammunition by demolition is according to the following formula:

- $R = 370 \times (AUW)^{1/5}$ 
  - Where, R = Range (metres); and
  - $AUW^{33}$  = All up weight of demolition (Kgs).

### **Blast Hazard Danger Area**

The safety distance for blast hazards is according to TNMA 10.20, as amended.

### **Thermal radiation safety distance**

These distances do not exceed those required for blast or fragmentation effects.

### **AIR SAFETY**

Whenever burning or demolition activities are planned, the Mission's Air Safety Officer and the Chief Aviation Officer shall be informed and all burning and demolition activities coordinated with both.

### **Vertical safety distances**

Vertical safety distances are to be calculated as follows:

- Vertical distance safety (fragmentation) (VDS (F)):
  - $VDS (F) \text{ single item of ammunition} = 314 \times (AUW)^{1/5}$ , (units m and kg) where AUW is the total weight (ammunition being destroyed plus charge(s)) of the item of ammunition; and
  - $VDS (F) \text{ stacked ammunition} = 470 \times (AUW)^{1/5}$ , (units m and kg) where AUW is the total weight (ammunition being destroyed plus charge(s)) of the largest single item of ammunition in the stack;
- Vertical distance safety (blast) (VDS (B)):
  - $VDS (B) \text{ no buffeting to aircraft} = 140 \times NEC^{1/3}$ , (units m and kg).

**VDS (B) buffeting tolerable distance is not to be used.**

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<sup>32</sup> All warnings and cautions contained in TNMA 10.20 "Estimation of Explosion Danger Areas", as amended, shall apply.

<sup>33</sup> The All Up Weight (AUW) includes the Net Explosive Content (NEC) of the munition, the weight of their casings and fusing systems and the weight of the donor explosive charge(s).

## **Application of procedures**

Both VDS (F) and VDS (B) are to be calculated and the larger distance selected. The distance is converted to feet, then rounded up to the next 100 feet and 500 feet then added. (For example, a distance of 420 m calculated from the formulae would be converted to 1,378 feet, rounded up to 1,400 feet; 500 feet would then be added, giving a vertical safety distance of 1,900 feet.)

## **ELECTRICAL HAZARDS**

Electrical energy can cause the accidental initiation of an explosive device or composition. The most common form of this is the discharge of static electricity, which may range from a lightning discharge ( $10^{12}$  Joule or 300kA of current), to that generated by a person of up to 0.02 Joule. Between these extremes are static charge releases from moving machinery, high voltage electrical apparatus and from granular explosives themselves, where friction between the grains on handling and pouring may build up a potential difference within the material.<sup>34</sup>

In the open, any use of explosives where an electro-explosive initiator, such as an electric detonator, is being employed is vulnerable to lightning. Disposal operations should be suspended if electrical storms approach within 10 kilometres of the ammunition disposal area.

Although static electricity accumulations and subsequent discharges are usually impossible if the relative humidity is above 60 per cent, use should be made of a grounding rod to enable all personnel working at the site to discharge any accumulated static electricity charges when working with ammunition or explosive natures that may be sensitive to static discharge.<sup>35</sup> If this is not possible, then all personnel should ensure they touch the ground with their bare hands at regular intervals.

## **OTHER CONSIDERATIONS**

The effects of noise, pollution, and atmospheric conditions must also be taken into account in deciding whether a demolition activity is to proceed. For example, a low cloud base can magnify the noise from a demolition and project it over a wide area than on a clear day, or a day with a higher cloud base.

**Attachment:**            **1.**        Ammunition Disposal Area - Explosives Limit Licence

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<sup>34</sup>        A. Bailey & S.G. Murray, Explosives, propellants & Pyrotechnics. Brassey's (UK), 1989, pages 71-72.

<sup>35</sup>        Generally, primer, initiator, detonator/blasting cap, igniter, tracer, incendiary, and pyrotechnic mixtures. Some explosives can be ignited by a static electricity spark discharged from a person, these include, black powder; igniter compositions; detonator/cap blasting compositions; aluminium, magnesium, titanium, uranium, or zirconium powder exposed in layers; mercury fulminate; mixtures of flammable vapours; potassium chlorate mixed with flammable dusts; pyrotechnic mixtures; smokeless powder dust when present; and tetrazene.



**AMMUNITION DISPOSAL AREA – LICENCE FORM**

Insert Licence Form here



**ANNEX D TO  
DDR AMMUNITION COLLECTION AND DESTRUCTION  
REVISED PRINCIPLES AND GUIDELINES**

**FIRST AID AND MEDICAL**

**GENERAL**

The treatment of casualties and their evacuation is according to the *Medical Support Manual for United Nations Peacekeeping Operations, as amended* (Reference D) and additionally, for ammunition related activities, the information contained in the following paragraphs.

**DEMOLITION AND BURNING GROUND OPERATIONS**

Every demolition and burning ground operation must have a qualified nominated First Aid person in attendance throughout the operations and a designated Safety vehicle. The First Aid person must remain outside the danger area with the designated safety vehicle and be in constant communications with the demolition/burning site. Additionally, the First Aid person must have a *Standard Trauma Kit* and bicarbonate solution for eye irrigation: see “Treatment” paragraph, on page 30.

Personnel working on the disposal of white phosphorous ammunition must wear protective glasses.

**Disposal of Depleted Uranium Ammunition**

Medical aspects and associated precautions associated with the disposal of DU ammunition are contained in TNMA 09.30/02 “Clearance of Depleted Uranium (DU) Hazards”, as amended<sup>36</sup>.

**Plants and Grazing Cattle**

Heavy deposition of uranium dust, i.e. of the order of g/m<sup>2</sup>, may have a toxic effect on plants and on grazing cattle. In addition, humans could eventually ingest DU so deposited, if the contamination enters the food chain. The fractional absorption of DU oxides in the human gut is less than one per cent of that ingested and therefore the likelihood of persons sustaining a significant radiation or toxicity effect by this route is extremely low, particularly as the sale and consumption of the small quantity of produce likely to be contaminated could easily be prevented.

**TREATMENT OF WP BURNS**

Ammunition-quality white phosphorus commonly is found in solid form. When exposed to air, it spontaneously ignites and oxidises rapidly to phosphorus pentoxide. Such heat is produced by this reaction that the element bursts into a yellow flame and produces a dense white smoke. This chemical reaction

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<sup>36</sup>

Current version is Version 1.0.

continues until either all the material is consumed or the element is deprived of oxygen. Phosphorus also becomes luminous in the dark.

Most injuries associated with white phosphorus are the result of accidents due to either human or mechanical error.

Incandescent particles of WP may produce extensive burns. The burns usually are multiple, deep, and variable in size. The particles continue to burn unless deprived of atmospheric oxygen. The smoke irritates the eyes and the nose in moderate concentrations.

### **Mortality/Morbidity**

Morbidity and mortality are related directly to trauma and burns sustained from exposure.

Burns usually are limited to areas of exposed skin (upper extremities, face). Burns frequently are second and third degree because of the rapid ignition and highly lipophilic properties of white phosphorus.

Trauma usually is a combination of blunt and penetrating. Blunt trauma results from the percussion and force of the blast, and penetrating trauma results from projectiles produced from the explosion.

### **Exposure Hazard to Health Care Providers**

Be aware of unconscious individuals with a history of percussion injuries from white phosphorus ammunition, who may pose an exposure hazard to the health care provider.

### **Self-Aid**

If burning particles of WP strike and stick to the clothing, take off the contaminated clothing quickly before the WP burns through to the skin.

If burning WP strikes the skin, smother the flame with water, a wet cloth, or mud. Keep the WP covered with the wet material to exclude air until the particles can be removed.

Try to remove the WP particles with a knife, bayonet, stick, or other available object. It may be possible to remove some particles by rubbing with a wet cloth.

Seek treatment as soon as the situation permits.

### **Treatment**

Since WP will ignite spontaneously and continue to burn when exposed to air, oxygen must be excluded until the agent is removed from the burn or the wound.

At the earliest opportunity, all WP particles must be removed from the skin.

Initially, the affected area is bathed in a bicarbonate solution to neutralize phosphoric acid, which will then allow removal of visible WP. Particles often can be located by their emission of smoke when air strikes them, or by their phosphorescence in the dark. In dark surroundings, fragments are seen as luminescent spots.

Promptly debride the burn if the patient's condition will permit removal of bits of WP that might be absorbed later and possibly produce systemic poisoning.

**DO NOT apply oily-based ointments until it is certain that all WP has been removed.** Following complete removal of the particles, treat the lesions as thermal burns.

Once the particles have been removed, they must be placed in a container of water to prevent injury to others in the surrounding area.

**If the eyes are affected, treatment must be initiated immediately.** The most effective treatment is to neutralize any phosphoric acid present by irrigating with 5 percent bicarbonate solution (5/6 cup (200 grams/7 ounces) of bicarbonate dissolved in a gallon (3.8 litres) of water). Continue irrigation for 10 to 15 minutes using copious amounts of normal saline or room temperature water. Upon completion of irrigation, a wet dressing/cloth or mud should be applied to stop the WP burning by depriving it of oxygen. All WP particles that are readily accessible must be removed promptly. Since WP is readily soluble in oil and certain other solutions, oily dressings or eye ointments must not be used. White phosphorus fumes are also irritating to the eyes and the respiratory tract. The lids must be separated and a local anaesthetic instilled to aid in the removal of all embedded particles. Once all particles have been removed from eyes, atropine ophthalmic ointment should be instilled. Transfer the patient to the care of an ophthalmologist as soon as possible.

**NOTE:**

**Cupric (copper) Sulphate (sulfate) has been used in the past and is still being used by some nations. However, copper sulphate (sulfate) is toxic and its use in the peacekeeping operations for the treatment of WP burns is discouraged. Copper sulphate (sulfate) may produce kidney and cerebral toxicity as well as intra-vascular haemolysis (hemolysis.)**



### **DISARMAMENT SITE – SCHEMATIC LAYOUT**

Insert layout here