Safeguarding of explosive facilities
Warning

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Foreword

Ageing, unstable and excess ammunition stockpiles pose the dual hazards of illicit proliferation and accidental explosion, which have caused destabilization and humanitarian disaster in all regions of the world.

Crucial for adequate stockpile management is the identification of surpluses – that is, the portion of weapons and ammunition that does not constitute an operational need. When surpluses are not recognized, the entirety of the stockpile may continue to be seen as of operational value. Although not used, weapons and ammunition surpluses thus continue to fill warehouses and can thus pose a significant risk to safety and security.

Defective stockpile management has been assessed as the norm rather than the exception in many countries. Often it is not only surplus stocks that should be the focus of attention, but the lack of appropriate policy for stockpile management. Governments remain unaware of surpluses; their national stockpiles remain a risk to public safety; and diversion from warehouses feed into crime and armed violence.

In 2011, the United Nations developed the International Ammunition Technical Guidelines (IATG) to ensure that the United Nations as a whole consistently delivers high-quality advice and support in ammunition management. Many stakeholders, including international organizations, non-governmental entities and national authorities, use these guidelines.

The IATG, along with other conventional ammunition issues, are managed through the United Nations SaferGuard programme.

Taking into account the diversity in capacity of States, three levels of ascending comprehensiveness are offered in the IATG, referred to as “risk-reduction process levels” (RRPLs). These are indicated within each IATG as either LEVEL 1 (basic), LEVEL 2 (intermediate) or LEVEL 3 (advanced).

The aim of implementing partners should be to maintain stockpile management processes at RRPL 1 as a minimum. This will often reduce risk significantly. Ongoing and gradual improvements could then be made to the stockpile management infrastructure and processes as staff development improves and further resources become available. These additional actions would equate to RRPLs 2 and 3.

The RRPLs are determined by calculating a weighted score of questions about a particular ammunition stockpile. A checklist is available at: https://www.un.org/disarmament/un-saferguard/risk-reduction-process-levels/.

The IATG are reviewed on a regular basis to reflect developing ammunition stockpile management norms and practices, and to incorporate changes due to changing international regulations and requirements. The IATG are also available in multiple languages.

The latest version of each guideline, together with practical IATG implementation support tools, can be found at https://www.un.org/disarmament/un-saferguard/.
Introduction

The storage, handling and transportation of military explosives are operations that present inherent risks to persons and property. A national authority shall therefore have a legal responsibility to ensure that during storage their explosives present risks to the general public that are both tolerable and as low as reasonably practicable (ALARP) should an explosive event occur.

One of the most efficient means of protecting the public from the effects of an explosive event is by the use of separation distances, which ensure that they are always at a tolerably safe distance from the explosives during storage and handling. These separation distances frequently extend beyond the boundary of the explosive facility. Past experience has shown that without a system of safeguarding the land outside the facility boundary the civilian population may build dwellings or commercial installations thereby negating the effective separation distance. If this occurs there should only be two options available to the ammunition storage facility: 1) the explosive quantity permitted for storage shall be reduced within the facility; or 2) the increased risk to the civilian population shall be formally accepted, even if it is above the tolerable risk level. Either option is undesirable. The alternative options of: 1) moving the civilian population from the area; or 2) moving the ammunition storage area are political decisions outside the scope of these guidelines.

Therefore to ensure that explosive facilities are not compromised by civil encroachment of private or public land development within the explosion danger area of the facility a system of safeguarding should be established.
Safeguarding of explosive facilities

1 Scope

This IATG introduces and explains the concept of safeguarding for explosive facilities. A safeguarding system is designed to prevent encroachment into the explosion danger area by the civilian population and hence ensure that appropriate separation and quantity distances are maintained.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

A list of normative references is given in Annex A. Normative references are important documents to which reference is made in this guide and which form part of the provisions of this guide.

A further list of informative references is given at Annex B in the form of a bibliography, which lists additional documents that contain other useful information on the safeguarding of explosive facilities.

3 Terms and definitions

For the purposes of this guideline the following terms and definitions, as well as the more comprehensive list given in IATG 01.40:2015(E) Terms, definitions and abbreviations, shall apply.

The term ‘explosion danger area’ refers to the area surrounding an explosive facility determined by the distances any blast or fragments may be expected to travel due to the detonation of ammunition.

The term ‘exposed site’ (ES) refers to 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 (PES) under consideration.

The term ‘inhabited building distance’ (IBD) refers to the separation between potential explosive sites (PES) and non-associated exposed sites (ES) requiring a high degree of protection from an accidental explosion.

NOTE 1 The IBD is a form of Outside Quantity Distance (OQD).

The term ‘outside quantity distance’ (OQD) refers to the minimum permissible distance between a potential explosion site (PES) and an exposed site (ES) outside the explosives area.

The term ‘potential explosion site’ (PES) refers to the location of a quantity of explosives that will create a blast, fragment, thermal or debris hazard in the event of an accidental explosion of its content.

The term ‘purple line’ refers to a continuous line drawn on a map or plan of an explosives storage location, which encompasses the explosives area and defines the minimum permissible distance between a potential explosion site and inhabited buildings which are by definition of vulnerable construction. It is usually at twice the yellow line or normal inhabited building distance determined by blast considerations.

NOTE 1 The construction of new inhabited buildings of curtain-wall construction or high rise buildings is restricted.

NOTE 2 The area within the Purple Line is known as the Purple Zone.
The term ‘quantity distance’ (QD) refers to the designated safe distance between a potential explosion site (PES) and an exposed site (ES).

The term ‘safeguarding’ refers to a consultative procedure with the appropriate local authority whereby safeguarded areas outside boundary fences are established for each explosives establishment.

NOTE 1 Explosives Safeguarding maps for each establishment are produced depicting a Yellow Line based on inhabited building distance (IBD) and a Purple Line, usually but not always, based on 2 x IBD.

NOTE 2 Copies are provided to the appropriate local authority. It is the aim to restrict the construction of any inhabited building, caravan site, or public traffic routes within the yellow line and the construction of curtain-wall and high rise buildings with large glazed areas, between the yellow and purple lines.

NOTE 3 All new applications for development within safeguarded areas should be notified to the national technical authority by the appropriate local authority in order that any necessary objections may be lodged.

The term ‘separation distance’ refers to a generic term for the safe distance between a potential explosion site (PES) and an exposed site (ES).

NOTE 1 Separation distances may or may not involve the use of the quantity distance system. They can be developed through the use of explosion consequence analysis.

The term ‘yellow line’ refers to a continuous line drawn on the map or plan of an explosives area which encompasses the explosives area and defines the minimum permissible distance between a potential explosion site and inhabited buildings, caravan sites or assembly places.

Alternatively it may refer to a line at the inhabited building distance within which the construction of new inhabited buildings, caravan sights and public traffic routes are restricted.

NOTE 1 The area within the Yellow Line is known as the Yellow Zone.

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

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

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

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

d) ‘can’ indicates possibility and capability: It is used for statements of possibility and capability, whether material, physical or casual.
4  Explosives safeguarding system

4.1  Rationale

A system of explosives safeguarding\(^1\) may not be required if the legal owners of the explosives facility also own all the surrounding land out to the appropriate separation distance for vulnerable buildings. In many cases this is unlikely to be the case, and therefore the State should ensure that it maintains a degree of control over the activities that may take place on that land. Certain activities that result in a low density of civilian presence, such as agriculture, should be permitted. Conversely, the building of civilian dwellings should not be permitted within the explosion danger area.

A formal system of safeguarding that permits the ammunition storage organisation to influence what activities are permitted within the explosion danger area should be developed and implemented.

4.2  System requirements (LEVEL 2)

The development and implementation of an explosives safeguarding system shall require the following:

a) the development of an appropriate national technical authority, which shall represent the State on behalf of all owners of explosives facilities nationwide. This authority should be actively involved in the implementation of an explosive safeguarding system;

b) the development of appropriate legislation that enables the owners of the explosives facility (usually the State) to influence future development within the explosion danger area (see Clause 4.3). The legislation may be used to establish the national technical authority (Clause 4.2(a)). The legislation should not allow the owners of the explosive facility to have a statutory right to unilaterally impose restrictions on development, although it may allow an appropriate Minister to impose such restrictions after all consultation has taken place;

c) the development of a consultative process between the national technical authority, local authority responsible for authorising building planning permission and the owners of the explosives facility;

d) the development of an appeals process should planning permission be granted for development within the explosion danger area despite the safety requirements of the owners of the explosives facility; and

e) the development of appropriate procedures to be followed by all parties prior to any planning permission being granted for development of land within the explosion danger area.

4.3  System components (LEVEL 2)

Once established a safeguarding system should consist of the following components, which are designed to support effective implementation of the safeguarding system:

a) safeguarding direction order (SDO). This should be signed at the appropriate level determined by legislation and should require that the local planning authority consult with the owners of the explosive facility before any planning permission is granted for development. A copy of an explosives safeguarding map should form part of the SDO; and

b) explosives safeguarding map (ESM). This should contain the information at Table 1.

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\(^1\) Referred to as safeguarding for the remainder of this guide.
<table>
<thead>
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<th>ESM Requirement</th>
<th>Explanatory Notes</th>
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<tr>
<td>ESM Map Scale</td>
<td>• At least 1:10,000, although 1:2,500m is preferable.</td>
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<tr>
<td>Aerial Photography</td>
<td>• Aerial photographs may be used as an alternative to maps.</td>
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<tr>
<td>Identification of Yellow Zone</td>
<td>• The Yellow Zone should be indicated by a Yellow Line around the explosives facility.</td>
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<tr>
<td></td>
<td>• The Yellow Line distance should be at the Inhabited Building Distance (IBD), see IATG 02.30 Licensing of explosive facilities.</td>
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<tr>
<td></td>
<td>• If the safeguarding is approved then no inhabited buildings should be developed within the Yellow Zone without the consultation process (Clause 4.2) being followed.</td>
</tr>
<tr>
<td>Identification of the Purple Zone</td>
<td>• The Purple Zone should be indicated by a Purple Line around the explosives facility.</td>
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<td></td>
<td>• The Purple Line distance should be at the Vulnerable Building Distance (IBD), see IATG 02.30 Licensing of explosive facilities.</td>
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<tr>
<td></td>
<td>• If the safeguarding is approved then no vulnerable buildings should be developed within the Purple Zone without the consultation process (Clause 4.2) being followed.</td>
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<td></td>
<td>• Such buildings would be high rise buildings, or buildings with curtain walls or glass facades.</td>
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<tr>
<td>Identification of the Red Zone</td>
<td>• The Red Zone is that area owned by the explosives facility.</td>
</tr>
<tr>
<td>Potential Explosive Limits</td>
<td>• The Yellow and Purple Lines may be developed based on the Potential Explosive Limits of the Potential Explosion Sites (PES) within the explosives facility rather than the Authorised Limits (Clause 7.1, IATG 02.30 Licensing of explosive facilities). This allows for more flexibility in storage within the explosives facility.</td>
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Table 1: ESM requirements

5 Maintenance of the safeguarded area (LEVEL 2)

5.1 General

The safeguarding of explosive facilities is crucial to the continued operational effectiveness of a site. Although a statutory system of consultation may ensure that the majority of intended land developments come to the notice of the owners of the explosive facility, the mechanism may not be foolproof. The reasons for this are essentially fourfold:

a) local authorities may occasionally, through error, omit to acquaint the owner of the explosive facility about local planning applications;  

b) the local authority maps may not be amended quickly enough in order to reflect any changes made to the safeguarded areas brought about by major changes in explosives licences through extensions to explosives facilities;  

c) landowners within the safeguarded area may develop land without first seeking planning permission from the local authority; and  

d) a national technical authority may not be in place to coordinate activities at sub-clauses a) and b) above.

2 Colours are used to define the zones within IATG. Other identification systems are permitted.
5.2 ESM review and inspection

Regular reviews and physical inspections of the safeguarded area should be conducted to maintain the integrity of explosives facilities and to identify any actual or potential encroachment into the safeguarded area.

The ESM should be formally reviewed, and the land within the safeguarded area physically inspected, on a quarterly basis to ensure that there has been no unauthorised land development (encroachment).

5.3 Action on potential encroachments

If an actual, or potential, encroachment is discovered, it is essential that its full nature is determined quickly, but with the utmost discretion. When trying to fully identify the infringement, the following rules should be observed:

a) the parent ministry of the explosives facility should be contacted without delay so that a formal consultative process with the relevant government ministry or local planning authority may be instigated;

b) no member of the explosive facility staff should take unilateral action by contacting the local authorities, as this may compromise any future legal processes; and

c) orders to stop work may only be given by the national technical authority or local authority to personnel working on a building or building site.5

Immediate action within the explosives facility, such as stock relocation, may be necessary to ensure that any risk to members of the public is maintained as tolerable and as low as reasonably practicable. This could affect quantity and separation distances and may not be an option, so suspension of work should be the priority option for the explosives facility to legally pursue.

Explosives facilities should be aware that landowners may legally carry out certain changes on their property without necessarily seeking planning permission from the local authority. All such changes, which come to the notice of the explosives facility, are to be notified to the appropriate national authority responsible for explosives licensing who shall determine the appropriate course of action.

3 For example new buildings are identified.
4 For example building activities have just commenced.
5 If an immediate order to stop work is not given, not necessarily by the owner of the explosives facility but essentially by the local or legal authority, the work on the building or building site may develop so much that it becomes very difficult to dissuade the landowners later legally. As both owner of the explosives facility and landowners have to comply with the law of the land, a temporary suspension of work may be imposed by the local authority pending settlement of the dispute either through consultative process or through legal means.
Annex A
(normative)

References

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

a) IATG 01.40:2015[E] Terms, glossary and definitions. UNODA. 2015;

b) IATG 02.20:2015[E] Quantity and separation distances. UNODA. 2015; and

c) IATG 02.30:2015[E] Licensing of explosive facilities. UNODA. 2015.

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

References

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

a) AASTP-1, Edition 1 (Change 3). Manual of NATO Safety Principles for the Storage of Military Ammunition and Explosives. NATO. 04 May 2010; and


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

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7 Data from many of these publications has been used to develop this IATG.
8 Where copyright permits.
Amendment record

Management of IATG amendments

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

As amendments are made to this IATG they will be given a number, and the date and general details of the amendment shown in the table below. The amendment will also be shown on the cover page of the IATG by the inclusion under the edition date of the phrase 'incorporating amendment number(s) 1 etc.'

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

The most recently amended, and thus extant, IATG will be the versions that are posted on the UN SaferGuard IATG website at www.un.org/disarmament/un-saferguard/.

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<td>01 Feb 15</td>
<td>Release of Edition 2 of IATG.</td>
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