Geneva International Centre for
Humanitarian Demining
Centre International de
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Explosive Remnants of War (ERW)
A “Quick Look” Threat Analysis

The **Geneva International Centre for Humanitarian Demining (GICHD)** supports the efforts of the international community in reducing the impact of mines and unexploded ordnance (UXO). The Centre is active in research, provides operational assistance and supports the implementation of the Mine Ban Treaty.

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Explosive Remnants of War (ERW)
Threat Analysis and Definitions

1 Introduction

The term "Explosive Remnants of War" (ERW) has been widely used in the CCW Review Conference preparatory discussions. While the term has not been specifically defined, it is understood by the ICRC to correspond to the term "unexploded ordnance" (UXO) which has been defined in several contexts. As discussions move towards the consideration of a mandate for further work on this subject, clarification of terms becomes increasingly important. ***(See accompanying Definitions Paper).***

It is not technically correct to gain agreement on a definition of ERW until the explosive threat in post-conflict environments has been examined. Once this threat has been determined, only then can agreement be reached on which elements of this wide-ranging threat are to be included under the concept of ERW.

The technical complexity, vulnerability, inherent risks, wide distribution and potential large volume of UXO, ammunition and explosives in the community in post conflict environments require that its destruction be efficiently and expertly managed and that appropriate risk analysis be conducted. There are often specific concerns regarding the render safe, disposal, safe storage, handling and transport of UXO, ammunition and explosives and these risks must be minimised in accordance with the operational environment. Sound technical advice and support at all levels is a prerequisite for the future success of peace support operations. The balance and emphasis of this advice will be dependent on the quantity of UXO, ammunition and explosives in the community, the perceived risk in theatre and the available resources.

2 Aim

The aim of this paper is to provide a “Quick Look” of the possible explosive threats in the post-conflict environment and make recommendations for adoption by the international community.

3 The explosive threat in post-conflict environments

3.1 General

The explosive threat in post-conflict environments can be divided into four major threat areas:

a) mine [1] and UXO [2] contamination of the ground;

b) abandoned Armoured Fighting Vehicles (AFV);

c) Small Arms and Light Weapons (SALW) [3] including limited ammunition and explosives in the possession of civilians and non-states actors; and

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[1] A **munition** designed to be placed under, on or near the ground or other surface area and to be exploded by the presence, proximity or contact of a person or a vehicle. [Mine Ban Treaty].

[2] **Explosive ordnance** that has been primed, fuzed, 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.

[3] There are a variety of definitions for SALW circulating and international consensus on a “correct” definition has yet to be agreed. For the purposes of this paper the following definition will be used, ***“All lethal conventional munitions that***

d) Former Warring Factions (FWF) stockpiles of ammunition [4] and explosives [5].

Although the definition of ERW has still to reach maturity, it has the potential to cut across all of these four threat areas, therefore consistency of definitions and an agreed threat analysis is essential. This paper does not attempt a full threat analysis, rather it highlights the major points of each threat area.

3.2 Mine and UXO ground contamination

The threat from mine and UXO ground contamination is well documented and will not be discussed in detail in this paper. Suffice it to say that there are a wide range of ammunition and explosive natures [6] available to combatants, all of which will have a certain failure rate. (Mines are, of course, different as they are waiting to be initiated). The major threat will be from the following generic groups (in ascending calibre or explosive content order). Those in ***bold italics*** contain ammunition types that are already the subject of ERW discussion;

a) small arms ammunition;

b) pyrotechnics

c) cannon ammunition;

d) ***sub munitions***;

e) ***anti-personnel mines***;

f) grenades;

g) mortar ammunition;

h) tank ammunition [7];

i) anti-tank ammunition;

j) field artillery ammunition;

k) anti-tank mines;

l) guided missiles;

m) air launched missiles;

n) aircraft bombs;

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can be carried by an individual combatant or a light vehicle, that also do not require a substantial logistic and maintenance capability"

[4] a complete device charged with **explosives**, propellants, pyrotechnics, initiating composition, or nuclear, biological or chemical material for use in military operations, including **demolitions**. [AAP-6].

[5] a substance or mixture of substances which, under external influences, is capable of rapidly releasing energy in the form of gases and heat. [AAP-6]

[6] Major source information is available from Jane's Air Launched Weapons; Jane's Ammunition Handbook; Jane's Infantry Weapons; Jane's Mines and Mine Clearance; Jane's Naval Weapon Systems; Jane's UAVs and Targets; US DoD Mine Facts; US DoD ORDATA; and NAMSA NATO Ammunition Database.

[7] Depleted Uranium (DU) rounds are not necessarily explosive, but do constitute a hazardous remnant of war. In definitional terms a DU fragment is non-explosive, but if it contains any unburnt tracer compound then it is explosive. Therefore a discussion point is the inclusion of DU ammunition in ERW. Further information can be found in Technical Note for Mine Action (TNMA) 0930 (02/2001) available on the GICHD website, (http://www.gichd.ch/standards/technical_notes.htm).

o) surface to air missiles[8] (SAM);

p) free flight rockets;

q) unmanned aerial vehicles and “cruise” missiles

Such a list is only intended to indicate the generic types of ordnance that would need to be considered in addressing the problems of explosive remnants of war. Further discussions are needed to determine to what extent it is necessary, in order to prevent or clear UXO, to define specific munitions that produce UXO.

When specific technical requirements aimed at prevention are being considered, such as increased reliability, self-destruct capabilities and detectability, it is clearly important to define the munitions to which such requirements would apply. When post-use clearance and information measures are being considered the general requirements that apply to all unexploded ordnance should be applied.

A more detailed Threat Analysis can assist in determining the risk, hazard and potential harm such UXO pose to the post-conflict community. The suggested methodology for such a study is at Annex A.

3.3 Abandoned AFV

The explosive ordnance disposal (EOD) clearance of armoured fighting vehicles (AFV) can be one of the most technically complex and demanding operations conducted by an EOD technician. It requires the development of render safe procedures (RSP) from first principles combined with a detailed understanding of the design and make-up of ammunition systems.

In post-conflict environments there could numerous reasons why the clearance of AFVs may be desirable in a post-conflict situation. These include:

a) to reduce risk to human life;

b) to permit the destruction of unserviceable or unstable ammunition;

c) to safeguard the environment;

d) exploitation to gain information on ammunition systems and other UXO faced by demining organisations;

e) to permit environmental clearance of the area, and the removal of AFVs;

f) to enable the recovery of corpses for war graves registration processes; and/or

g) to prevent the recovery of ammunition by others for improper purposes.

The threat posed by abandoned AFV can be complex, involving many components parts; 1) surrounding mines and UXO, 2) depleted uranium (DU) fragments; 3) explosive reactive armour (ERA); 4) unstable stocks of internally stowed ammunition and 5) access denial devices.

Therefore, it can be argued that abandoned AFVs are, in themselves, an Explosive Remnant of War (ERW) [9].

[8] Shoulder launched SAM will have lower calibre and explosive content.

[9] A more detailed threat analysis may be found in TNMA 09.30 (01/2001) EOD Clearance of AFV. Available on the GICHD website, (http://www.gichd.ch/standards/technical_notes.htm).

3.4 Small Arms and Light Weapons (SALW)

The overwhelming weapon of choice in the conflicts that have ravaged developing countries over the last decades has been the rifle or other small arms that can be easily purchased, easily concealed and carried, and easily used. These small arms kill over 200,000 people a year, injure many more, and drive millions of people from their homes and communities.

As a result, it has been recognised by a number of actors—among local communities, national governments, and the international community—that programmes to collect, manage and destroy small arms as part of a comprehensive approach to restore stability in affected areas are essential. Reducing the prevalence of small arms, while providing alternatives to violence through livelihood opportunities combined with an improved security and environment of obedience to human rights have yielded significant results. Yet small arms and ammunition are inherently dangerous, and mishandled or mismanaged, they represent grave dangers, not only for a small arms programme, but also for the entire peace-building effort. There are inherent dangers in dealing with unstable ammunition and explosives caused by, for example; 1) leaking explosive content; 2) degradation of fuze safety systems; or 3) degradation of propellant stabiliser leading to autocatalytic ignition and spontaneous combustion.

These micro-disarmament programmes inevitably lead to the return of unstable and inherently dangerous ammunition and explosives in parallel with the return of weapons. Not only does this create a physical threat to human life, but also it can be a threat to the whole disarmament, demobilisation and reintegration process. Any civilian casualties as a result of the instigation of such programmes can have a negative effect on the credibility of the organisation conducting the operation, leading to a lack of confidence in their abilities by the local community and the subsequent withdrawal of consensual support for the process. Without appropriate weapon and explosive safety measures, past experience has shown that such casualties are inevitable.

3.5 Former Warring Faction (FWF) stockpiles of ammunition and explosives

The age of the conventional ammunition stockpiles, when combined with inadequate storage conditions and limited danger areas, poses a significant threat during post conflict operations. The effect of an explosion within an ammunition depot is devastating, resulting in a requirement for a subsequent major EOD clearance operation. The threat to human life from blast and fragmentation is significant due to encroachment of habitation into explosion danger areas.

The inherent dangers are similar to those posed at paragraph 3.4; but more complex issues tend to appear in ammunition storage areas. One major threat, for example, is the hazard posed by the storage of liquid bi-propellants. If the two compounds leak, and are allowed to mix in vapour form, there is resultant spontaneous combustion.

4 Conclusions

This paper identifies the major explosive threat areas in post-conflict environments, for which a full threat analysis needs to be developed. These threat areas are represented by a large number of different munition types, which constitute ERW.

5 Recommendations

The international community should develop a full threat analysis of the major threat scenarios identified in this paper.

Annexes:

A. Threat Analysis Study Methodology

Annex A
Threat Analysis Study Methodology