



**LANDMINES, EXPLOSIVE
REMNANTS OF WAR AND IED
SAFETY HANDBOOK**



UNMAS

THE UNITED NATIONS AND CONTRIBUTING ORGANIZATIONS SHALL NOT BE HELD RESPONSIBLE FOR DEATHS OR INJURIES TO PERSONNEL AND/OR DAMAGE TO PROPERTY THAT MAY RESULT FROM THE USE OF THIS HANDBOOK.

Any comments or questions concerning this handbook may be addressed to:

United Nations Mine Action Service (UNMAS)
New York, NY 10017 USA

E-mail: mineaction@un.org

Website: www.mineaction.org

© United Nations 2015 (3rd Edition)

All rights reserved

COVER PHOTOS

Background, UN Photo / Iason Foonnten

Miner, UNMAS Photo / Marc Vaillant

MINE ICONS

Cover & Pages 8, 9, 36, 37, 56, 57, 76, 77, 88, 89, 96, 97

Critical Mass

EDITOR

Thomas Enke

DESIGN & LAYOUT

Mackenzie Crone



**UNITED NATIONS
LANDMINES, EXPLOSIVE REMNANTS of WAR
and IMPROVISED EXPLOSIVE DEVICES
SAFETY HANDBOOK**

United Nations

United Nations Mine Action Service (UNMAS)

New York, NY 10017 USA

E-mail: MineAction@un.org

Website: www.mineaction.org

**A manual for people working in environments contaminated
by landmines and other explosive hazards including
improvised explosive devices.**

TABLE OF CONTENTS

Acknowledgements	5
-------------------------	----------

Introduction	6
---------------------	----------

1 The threat **9**

1.1 Landmines	11
1.2 Unexploded ordnance	19
1.3 Abandoned ordnance	32
1.4 Improvised explosive devices and booby traps	33

2 Recognizing dangerous areas **37**

2.1 Warning signs	38
2.2 Warning clues	42
2.3 Signs of fighting or military activity	45
2.4 Signs in the environment, dead animals and unusual objects	49
2.5 Local behaviour	53

3 Basic safety advice **57**

3.1 Risk-taking behaviour	59
3.2 Common myths about mines and explosive remnants of war	62
3.3 Safety advice for organizations	64
3.4 Safety advice for individuals	66

4 Emergency procedures 77

- 4.1** Emergency procedures in an EO contaminated area or minefield **78**
- 4.2** Emergency procedures on in case of an IED attack **84**

5 Assisting a victim 89

- 5.1** Evacuation from a spot of an unknown explosion **91**
- 5.2** Administering first aid **92**

Annexes 97

- A1** Use of route cards **98**
- A2** Measures to provide additional protection to a vehicle **106**
- A3** 5/25 metre check **108**
- A4** Other threats **109**
 - A4.1 Depleted uranium
 - A4.2 Biological and chemical weapons threats
- A5** Evacuation distance guide **114**
- A6** Nine-liner **114**
- A7** Glossary **116**
- A8** Abbreviations **120**
- A9** For further information **120**

Emergency contacts 125

Notes 126

PICTURE 0.1

Keeping a safe distance, inhabitants of an Afghan village observe a demolition. UNMAS Photo/Thomas Enke



Acknowledgements

This handbook is the 3rd edition of the former Landmine and Unexploded Ordnance Safety Handbook produced by the United Nations in 2005, which was originally based on the Land Mine Safety Handbook developed and published by CARE in 1997. The handbook has been substantially revised, including its title, to reflect latest terminology. Also new developments in the field of Demining, Explosive Ordnance Disposal (EOD) and Improvised Explosive Device Disposal (IEDD) as well as emergency medical assistance were considered. The increasing threat by IEDs led to further additions in the present chapters.

The Landmines, Explosive Remnants of War and Improvised Explosive Devices Safety Handbook draws upon information found in International Guidelines for Landmine and Unexploded Ordnance Awareness Education developed by the United Nations Children's Fund (UNICEF) in 1999, and International Mine Action Standards published by the United Nations (www.mineactionstandards.org). The Landmine, Explosive Remnants of War and Improvised Explosive Devices Safety Handbook is part of the Landmine Safety Project of the United Nations Mine Action Service (UNMAS).

Introduction

Landmines and other explosive hazards, which include abandoned munitions and military equipment, unexploded ordnance and other explosive remnants of war (ERW), as well as improvised explosive devices (IEDs) pose a hazard all over the world.

This handbook is not an instruction manual for working with landmines and explosive hazards. It is not a guide for working with landmine, ERW and IED affected communities. Rather, its aim is to raise awareness and provide basic safety information concerning the threat of landmines, ERW and IEDs to organizations and individuals working in affected areas, and to help them:

- Establish appropriate safety procedures;
- Avoid contact with mines, ERW and IEDs and
- Take appropriate action in emergency situations.

Proximity to explosive devices is always dangerous and should be avoided. Only trained specialists should seek out or handle landmines, ERW and IEDs.

The information contained in this handbook is general in nature and some of it may not be applicable in all situations. Accordingly, it should be complemented by country-specific information, and an analysis of the nature and extent of local threat. In addition, this handbook is not designed as a stand-alone document, but should be used in support of a safety briefing about explosive devices by qualified instructors.

Did you know?

As of January 2015, 162 states parties signed and ratified the Anti-Personnel Mine-Ban Treaty (APMBT also known as the Ottawa Convention). One state signed, but not yet ratified the treaty. In doing so, the state parties have accepted to stop using, stockpiling, producing and transferring anti-personnel (AP) mines and also agree to their destruction. The Convention also has provisions for landmine victims to receive assistance.

Whenever possible, readers should seek the guidance and advice of specialists working in their area of operations.

The handbook is divided into five main sections and annexes.

SECTION 1

provides information on the nature of the threat from mines and other explosive hazards: ERW and IEDs;

SECTION 2

provides advice on recognizing the threat;

SECTION 3

provides general safety advice and information on avoiding the threat;

SECTION 4

explains what to do if you find yourself in an ammunition contaminated area and

SECTION 5

provides basic information on what to do in case of an accident.

The annexes provide examples of travel procedures, information on other threats, such as depleted uranium, chemical and biological ammunition and gives methods for creating a secure environment.

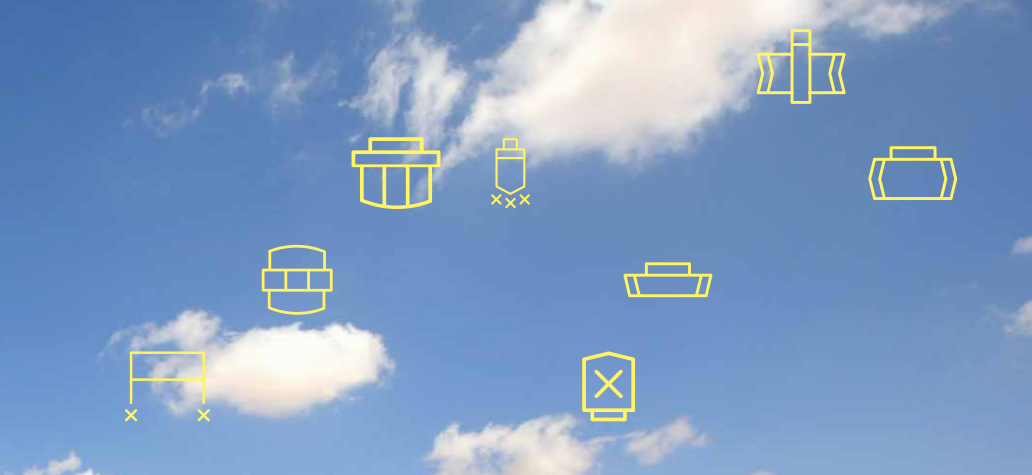
Since the Convention came into force in 1999, the use of anti-personnel mines has decreased. However, a few states (non-signatories to the treaty) continue to use and stockpile AP landmines, and 59 states and 4 other areas have some form of widespread landmine contamination from past and on-going conflicts.¹ AP mines represent some of the most serious threats to people working in post-conflict areas, even decades after a conflict.

¹ Landmine and Cluster munition Monitor, Jan 2015



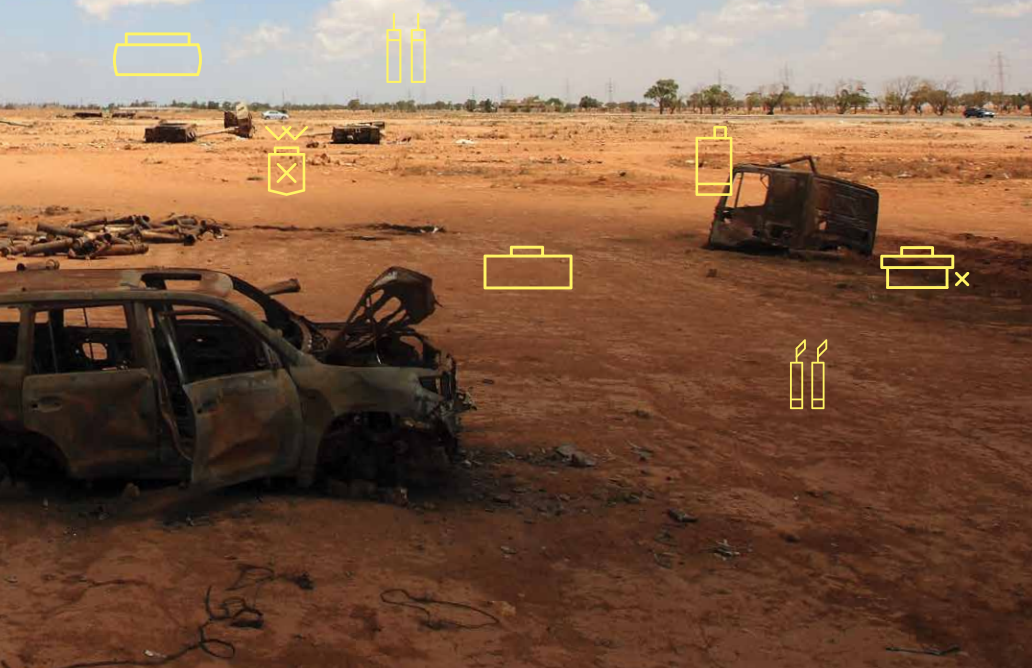
Libya

UNMAS Photo/Giovanni Diffidenti



SECTION 1

The threat



The threat

People who work in areas that have experienced armed conflict may be confronted with the threat posed by landmines and explosive hazards, which include unexploded or abandoned ordnance, abandoned military vehicles and equipment, as well as IEDs. (Note that the term ERW includes unexploded ordnance (UXO) and abandoned ordnance but excludes landmines, see definition in the glossary, Annex 6). Any kind of explosive device may block access to project sites or pose a direct threat to safety, even years after a conflict has ended. When working in such areas, organizations and individuals must be aware of the physical threats posed by a huge variety of armaments left during and after armed conflict.

To protect yourself, you need to be aware of the threat and take appropriate preventive action. This section aims to help identify mines, ERW and IEDs, and explains how they work and their effects. It is impossible to describe all types of mines, ERW and IEDs in this handbook, so common sense must be applied. As a general rule, always regard unusual objects with suspicion. A description of some of the more common threats follows.

Did you know?

The word “mine” is derived from the Latin word *mina*, which means “vein of ore” and was originally applied to the excavation of minerals from the earth. The term was then borrowed by military engineers whose job was to dig mines in the ground during sieges of forts and castles, often under walls to collapse them. Modern landmines are explosive traps, but they also trace their lineage from non-explosive predecessors such as spikes and stakes used by ancient armies as far back as 2,500 years ago.

Croll, M., History of Landmines. 1998

1.1 Landmines

A landmine is an explosive device designed to destroy or damage vehicles, or to wound, kill or otherwise restrict people's activities. Mines can be victim activated, that is, detonated by the action of their target by being stepped on or struck or can be triggered by direct pressure, tripwires, tilt rods, command detonation, or by some combination of these methods. They can also be booby trapped by using, for example, anti-handling devices, to make their removal more difficult. They may also detonate with the passage of time.

Mines are used as defensive weapons: they provide protection for important military positions or hinder the movement of troops by causing casualties to an enemy and destroying equipment. They are also used offensively: in particular during conflicts they are used to destroy or damage infrastructure and cause terror by denying civilian populations access to their homes, agricultural land, water, roads, schools, health care facilities and other resources. Landmines are often used as parts of an IED. The explosives of a landmine could be used for the main charge or the landmine itself as a trigger for a Victim Operated IED (VOIED).

Landmines are almost always hidden and camouflaged to match their surroundings, making them seldom seen and difficult to locate. They are usually buried or hidden in grass or buildings, fixed on stakes or to trees. During conventional warfare, landmines are usually laid in patterns to create consistent barriers, or along roads and around strategic points. In the case of new minefields, locations have to be recorded on maps², but this is not always reliable. More



PICTURE 1.1
Minefields, booby traps and ERW can be found all over the world, sometimes a long time after a conflict. UNMAS Photos/Thomas Enke

² Amended Protocol on Prohibitions or Restrictions on the use of Mines, Booby-Traps and Other Devices, GENEVA 03.NOV 1996

often than not, they are laid indiscriminately by armed parties that are constantly on the move; some landmines are even scattered by aircraft or artillery over a wide area with no obvious or discernible pattern.

There are currently more than 600 different types of landmines, as well as many improvised mines made by military (opposite) forces engaged in fighting. They are grouped into two broad categories: Anti-Personnel (AP) mines and Anti-Vehicle (AV) mines, also commonly referred to as Anti-Tank mines.

1.1.1 ANTI-PERSONNEL LANDMINES

An Anti-personnel (AP) landmine is designed to be detonated by the presence, proximity or contact of a person, and is intended to incapacitate, injure or kill one or more people. AP mines are usually detonated when they are stepped on or when a tripwire is touched, but they can also be set off by the passage of time or by controlled means.

AP mines can be found on the ground, buried or fixed above ground and are generally small devices that come in many different shapes. Often, they are camouflaged to help them blend into the surroundings and can be fabricated of wood, plastic or metal. Areas suspected of containing AP mines should be avoided.

Once triggered, AP mines cause death or serious injury by an explosive blast and/or flying fragments. They are grouped according to the manner in which they inflict injury: blast, fragmentation or a small shape charge³.

³ E.g. Canadian C3A2 AP-Mine

Command activated

A process where a second person detonates a mine by remote control. This person is named a Triggerman.

Victim activated

Triggered by a person when it is stepped on, driven over, struck, or by some similar action.

Anti-handling device

A device fitted to an anti-vehicle or anti-personnel mine that causes the mine to explode when it is handled or disturbed. Anti-handling devices are intended to prevent the clearing of mines. Anti-Handling Devices could also be fitted to ERW or IEDs.

1.1.1.1 Blast anti-personnel landmines

Blast AP mines are often very cheap and are among the most commonly found in the world. They are designed to be triggered by the pressure caused by physical contact with the mine, mostly by stepping on them. Most mines of this type are designed to cause serious injury, usually the amputation of one or more limbs, rather than death.

Blast AP mines are generally cylindrical in shape, and range in size from 7 to 16 cm in diameter and 5 to 10 cm in height. However, some blast AP mines are rectangular or “shoe box”-shaped. They then range in size from 10 cm x 18 cm to 15 cm x 30 cm. Most AP mines have a relatively small explosive charge, often less than 100 grams. The concentrated blast of the charge is what causes death or injury.

Case study

Landmine and other explosive hazards continue to maim and kill innocent people around the globe. To have an idea of the scope, just search on the Internet for “Landmine Accidents 2015”. Croll, M., History of Landmines. 1998

PICTURE 1.2

This small AP-mine can tear off a foot! It is about 10 cm in diameter and when buried is almost impossible to see (left). The same mine uncovered by deminers (right).

UNMAS Photos/Thomas Enke



While some blast AP mines are still made of metal or wood, most are manufactured of plastic. This makes them water resistant or waterproof, and dangerous even when submerged. Following heavy rains, it is not uncommon for some mines to wash out of minefields into previously mine-free areas, or into waterways where they can be swept kilometres downstream before washing ashore. Blast AP mines are usually tan, olive, green, black, brown, grey, or a combination of colours.

In addition to buried Blast AP mines, a common type of mine is the “butterfly” mine (or similar variants), which are scattered over the ground by aircraft or artillery fire (see also the chapter about cluster bombs). If recently delivered, these mines are usually found lying around in large numbers. Even after months or years, single mines may still be found in cleared areas. Butterfly mines have a combination of odd shapes and often bright colours that can make them unique and attractive to curious children and adults.

1.1.1.2 Fragmentation anti-personnel mines

Fragmentation Anti-personnel mines are typically designed to cause death, often to a large number of people, from fragments propelled by the mine’s explosive charge. Most of these mines have metal casings, or contain ball bearings or metal fragments that are turned into lethal projectiles by the detonation of the mine.

There are three basic types of fragmentation AP mines: stake mines, directional fragmentation mines and bounding fragmentation mines.



PICTURE 1.3

Box shaped AP mine. Similar mines can be found all over the world. UNMAS Photo/Thomas Enke

PICTURE 1.4

These air-delivered “butterfly mines” PFM-1 can explode when touched; Afghanistan. UNMAS Photo/Thomas Enke

PICTURE 1.5

War-Production of a Claymore-type AP-mine, found in the Balkans. UNMAS Photo/Thomas Enke

> 1.1.1.2.1 STAKE ANTI-PERSONNEL MINES

The most commonly found fragmentation AP mines are stake mines, which are designed to fit on wooden or metal stakes hammered into the ground until the mine is resting about 20 cm above the surface. They are also fixed to trees. Most look like a small club: a wooden stake, topped by a small metal cylinder and detonator projecting out of the top. They are often painted green, or they may be unpainted wood and metal. Rusty metal surfaces make it easy to overlook the mines, especially in areas with old vegetation.

Stake mines are fitted with one or more tripwires that set the mine off when pulled or cut. Tripwires are very hard to see, and may be strung across paths or doorways, and attached to a solid object such as a tree or to another mine.

Once set off, metal fragments are projected in a 360-degree radius, causing lethal injury to anyone within an unobstructed 4 metre radius and causing death and serious injury to people at much greater distances. One common mine – the Russian POMZ-2M – detonates and shatters to create fragments that are likely to be lethal within a 10 metre radius. Beyond this, the uneven size and distribution of the fragments makes the effect unpredictable; large fragments may injure or kill at a range of 100 metres or more.⁴

Over time stake mines may fall over, or the stake on which they rest may disintegrate. This does not make them less dangerous, and in some cases, when the tripwire is less visible, makes them more dangerous.

⁴ Source for ranges: Colin King, author of *Jane's Mines and Mine Clearance* and *Jane's Explosive Ordnance Disposal*.

Tripwire

A thin, non-reflective metal wire or string which can be used as a mechanism to trigger a mine, a Booby-trap or a VOIED. A tripwire is usually stretched low above the ground so that any passer-by will “trip” over it, setting off the explosive. When tripwires are used, they can run as far as 30 metres from the mines.



PICTURE 1.6

Ideal for the use of a stake mine with a tripwire: An abandoned weapon-cache at the end of a path with overgrown foliage.

UNMAS Photo/Thomas Enke

> 1.1.1.2 OMNIDIRECTIONAL FRAGMENTATION ANTI-PERSONNEL MINES

Omnidirectional (or “Claymore” type) fragmentation anti-personnel mines are designed to project a dense pattern of fragments in a specified direction. Most look like a curved rectangular or round box about the thickness of a paperback book. This box sits on two sets of legs or a stand, and is generally coloured olive, black or brown.

Directional Fragmentation AP mines are usually command detonated, but they can also be initiated by tripwire or pressure-plates. Once detonated, most mines of this type project their fragments within a 60-degree horizontal arc and to a height of about 2 metres. Most are designed to have an “effective range”, causing serious injury or death of around more than 50 metres.

Other versions of these mines are large and circular in shape and project shrapnel in a narrow cone, like a shotgun. They are capable of killing people, as well as disabling or destroying passenger soft-skinned vehicles.

> 1.1.1.2.3 BOUNDING FRAGMENTATION ANTI-PERSONNEL MINES

Bounding mines are normally buried and often linked to tripwires. Most bounding mines are cylindrical in shape, with a single tubular fuse or a number of prongs sticking out from the top. They are typically around 10 cm in diameter and 28 cm in height. Bounding mines are usually tan, olive green, black, brown, and green, or are left unpainted. After a couple of years the metal surface looks rusty so that the mines are hard to see.



PICTURE 1.7

Stake AP mine. You can see the tripwire.

UNMAS Photo

PHOTOS 1.8

Middle: “Claymore” type mine MON-50 shoots fragments in one direction—often at a road or path. Several mines may be interlinked; they may also be mounted in trees! Bottom: The Piezo-Pressure-Sensor of a Claymore-Mine.

UNMAS Photo

1.1

Landmines

1.1.2 ANTI-VEHICLE LANDMINES

Bounding AP mines are generally triggered by tripwires or direct pressure. Once triggered, an initial explosion lifts the mine out of the ground to about waist height before the main charge detonates. Upon detonation, the explosion shoots out metal fragments in a 360-degree horizontal radius. Design variations mean that the number, size and distribution of fragments vary widely, but a typical bounding mine is likely to be lethal within 25 metres and capable of inflicting serious injury at ranges up to 100 metres.

> 1.1.1.2.4 ANTI-PERSONNEL MINES WITH A SHAPE CHARGE

AP Mines with a shape charge are generally buried. They have a cylindrical shape with a conical tip for an easier push into the soil, and a round plate for firm positioning in the soil. With a diameter of about 5 cm and a height of about 12 cm they are painted in different colours, mostly ochre, green or black.

Stepping on the AP mine will trigger the fuse (Victim Operated). In general this kind of an Anti-Personnel mine is not designed to kill the victim. The small amount of explosives fires a shaped charge through the sole of the feet and ankle up into the knee causing damage to the lower leg. An amputation above the knee and long-term treatment can be the result.

1.1.2 ANTI-VEHICLE LANDMINES

Anti-Vehicle (AV) mines, often referred to as Anti-Tank mines, are designed to disable or destroy vehicles. Like Anti-Personnel mines, Anti-Vehicle mines can be detonated by pressure, though normally much greater weight is needed, by remote control, by magnetic influence or through the disturbance of a tilt rod (a sort of vertical



PICTURE 1.9

Bounding mines first “jump” to a height of about 1 metre when activated and then explode, which is very lethal. UNMAS Photo/Thomas Enke

Note: Never touch, approach or step over tripwires

tripwire – see box for definition). A Glass-Fibre-Cable, laid on the road, can also be used to trigger directed AV-Off road mines, firing small fin-stabilized Anti-Tank-Rockets. They can be positioned between 2 and 40 metres on either side of the road, mounted on a small tripod or attached to a tree. Because AV mines are made to destroy vehicles, they are generally found on roads, roadsides, paths, tracks and the verge of the road. Even roads that have been driven on for some time can contain AV mines.

AV mines are much larger than AP mines, and have a far heavier explosive charge. They are generally round or square in shape, and range in size from 40 cm in diameter and 16 cm in height to 23 cm in diameter and 10 cm in height. They can be made of wood, plastic, or metal and come in a range of colours. AV mines charges are about 6 kg HE, but they can also have a shaped charge.

Additionally AV mines are often used as a main charge of an IED. The fuse can be hidden under or built inside the mine. This means the lifting of supposedly unfused mines can be dangerous.

It normally takes considerable pressure to detonate a standard AV mine, around 120 kg to 150 kg. This does not necessarily mean that people weighing less can safely step on an AV mine. Fuse systems may deteriorate or be deliberately adjusted, resulting in a reduction in pressure required to detonate AV mines. Sometimes AV mines are booby trapped to be detonated when they are disturbed. In some cases AP mines have been laid on top of AV mines which, when initiated, will generally cause the AV mine to detonate as well. Be aware also that AP mines are often used to prevent AV mines from being removed, and the technique of laying AP mines and AV mines together in clusters is common.



PICTURE 1.10
Canadian AP Mine C3A2
with Shaped Charge
Effect. UNMAS Photo/
Thomas Enke

Note: Never approach, touch or tamper with UXO! Ordnance may have penetrated the ground without detonating and can still be dangerous.

1.2 Unexploded Ordnance

As AV mines are often designed to disable large military vehicles like tanks, their impact on smaller civilian vehicles is usually catastrophic and results in the destruction of the vehicle, and death or serious injury to the occupants.

1.2 Unexploded ordnance

UXOs are explosive munitions that have been fired, thrown, dropped or launched but have failed to detonate as intended. UXO include artillery and tank rounds, mortar rounds, fuses, grenades, and large and small bombs including cluster-munitions, submunitions, rockets and missiles.

Tilt rod

A thin pole attached to the fuse mechanism on the upper surface of a mine. Pressure exerted on the tilt rod sets off the mine.

PICTURE 1.11

Albanian Anti-vehicle mines MKT Mod.72, found in a cache; Kosovo 2009. UNMAS Photo/Thomas Enke



1.2 Unexploded ordnance

Ordnance fails for many reasons: fuses and time-delay igniters may be defective, incorrectly calibrated, or soft soil may absorb the impact required for detonation. Whatever the reasons, UXOs remain a serious danger to life and health. Some countries have been affected by UXOs for more than 150 years.

In areas that have experienced bombing or protracted battles, large quantities of UXOs may contaminate the land. In the case of cluster munitions for example, as many as 30 per cent may have failed to explode on impact, and remain a serious hazard for years after conflict. In many countries, UXOs are more common than landmines and may be more widely dispersed. Note too, that UXOs and their threat can be found in areas previously thought to be cleared, especially in countries that have suffered protracted conflict.

UXOs are often extremely unstable and can detonate at the slightest touch. Injuries can often occur when people are farming or undertaking construction work in a contaminated area and touch, move or tamper with them. Some UXOs may contain motion-sensitive fuses or magnetic sensors; other UXO may have a timed self-destruct feature that may not have functioned properly. Because the state or condition of UXOs cannot easily be determined, they must all be considered extremely dangerous and should never be touched or disturbed by anyone except explosive ordnance disposal professionals. UXO accidents are often more lethal than landmines due to their higher explosive and fragmentation content.

UXOs are usually found in areas where fighting has taken place or at military firing ranges. UXOs can be discovered inside and outside of buildings. They can be buried beneath the ground or hidden



PICTURE 1.12
77 mm x 229 Cartridge
Krupp, Essen/Germany
1906 - built for the
Turkish forces; Kosovo.
UNMAS Photo/Thomas Enke

PICTURE 1.13
Unexploded ordnance;
Air to Surface Rockets
S-24, Afghanistan. UNMAS
Photo/Thomas Enke

PICTURE 1.14
Only an old helmet?
Don't pick it up! UNMAS
Photo/Thomas Enke

1.2 Unexploded ordnance

1.2.1 GRENADES

beneath rubble or collapsed walls. UXOs can even be found lodged in trees or hanging from branches, hedges and fences as well as a souvenir inside homes.

UXOs come in various “military colours”— khaki, green, brown, tan, grey – or can be unpainted. They are usually made of metal, but can also be made of plastic. If they have been in the open terrain for a long time, UXOs may be rusted and discoloured, partially hidden, obscured by dirt and mud and difficult to recognize. Despite looking like harmless scrap, they remain extremely dangerous.

1.2.1 GRENADES

Grenades are explosive devices usually thrown by hand or projected from rifles or grenade launchers. Grenades detonate either on impact or through a time–delay mechanism; both mechanisms may fail. “Defensive” fragmentation grenades are the most common, but there are also “offensive” blast grenades, incendiary grenades, chemical or gas grenades, and smoke grenades. A typical fragmentation hand or rifle grenade is likely to be lethal within 10 metres, with a danger area extending to 50 metres or more.

Hand grenades have a pineapple shape, cylindrical or round bodies about the size of an adult fist and up to 10 cm long. Grenades come in various colours. Stick grenades are hand grenades placed on a short stick, which increases the throwing distance. Metal was the most common material used for making grenades but gas and chemical (smoke) grenades may be made from plastic as well.

Case study

Cambodia is one of the most mine-affected countries in the world, but UXOs now kill and injure more Cambodians each year than landmines. Children are particularly vulnerable often due to their natural curiosity and tendency to touch. Accidents involving adults are also usually a result of tampering or handling UXOs.

Note
If there are AV mines assume there are also AP mines.

Rifle grenades have a cylindrical body, mostly with a round nose and are fin-stabilized. They contain no propellant in the tail, but if it hasn't been fired, the tail could be clipped inside with a special cartridge (which is loaded into the rifle for firing). All fillers are possible, e.g. screening smoke, illuminating, tear gas and high explosives. Due to the slow velocity of the rifle grenade, the fuses are very sensitive and the approach to a rifle grenade should be avoided.

With a special adapter it is possible to fire hand grenades from a rifle. This has to be considered in the assessment of battlefield clearing.

Rocket assisted grenades like the PG-7 anti-tank grenades have an additional rocket motor to enhance the range. This type of ammunition is multipurpose and widespread, found in large numbers and comes in several types. The grenade can be built with High Explosives (HE)-, Fragmentation (FRAG)-, High Explosive Anti Tank (HEAT- or Fuel Air Explosives (FAE)- functions. The light AT-ammunition has a very sensitive fuse. A fast change of temperature can trigger the fuse. Also abandoned or dud ammunition can contain propellant from the rocket motor.

1.2.2 MORTAR ROUNDS

Mortar rounds are projectiles that are launched mostly from tubes of metal about 90 cm to 170 cm in length, known as mortars. In the last years complex mortar-systems were developed so that the difference between a howitzer and a mortar cannot be easily decided. Modern mortars are able to fire directly and indirectly and can be loaded like normal guns. One important characteristic should



PICTURE 1.15

A 40 mm x 46 M430A1 HEDP grenade, found on a training range in Afghanistan – Troops from stabilization or peacekeeping forces have the responsibility to remove their Explosive Remnants after any training or exercise. UNMAS Photo/ Thomas Enke

PICTURE 1.16 & 1.17 >

(Next page, bottom right) Hand grenades, new and old, can be unstable, regardless of how long they have been lying on the ground. Here a Russian F1 and a former Yugoslavian M-50 Hand grenade. UNMAS Photos/Thomas Enke

1.2 Unexploded ordnance

1.2.2 MORTAR ROUNDS

be that a mortar round uses less propellant charge as a projectile of a gun or howitzer. Mortar rounds are loaded into the tube from the front or the rear (depending on the system) and launched by their own propellant charge. Mortar rounds often have a tapered nose at the front and fins at the rear. The metal bodies can range from 45 mm to current 240 mm diameter in width and from around 30 cm to over one metre in length.⁵ Due to their ease of use, relatively low cost and portability, mortars are an extremely widespread weapon of war.

Mortar bombs are usually made of metal and when found may be rusted and discoloured with age. On impact they make craters, and the site of a detonation is usually obvious. On paved roads they create what looks like “splash marks” in the concrete or tarmac road surface.

⁵ The smallest mortar system should be the Italian BRIXIA-Mortar M35 with a calibre of 45 mm, the largest the German KARL with a calibre of 600 mm. Both systems are no longer in use, but current ERW can be found in Europe.



PICTURE 1.18

Watch your steps: A large rifle grenade that failed to detonate. A Yugoslavian M-60P1 HEAT-Rifle Grenade is sticking out the ground. UNMAS Photo/ Thomas Enke



The lethal and hazardous ranges of mortar bombs vary widely depending upon the calibre of the weapon. A small mortar bomb with a high explosive charge can destroy a car, while larger mortar bombs can destroy small to medium-sized buildings. Other fillers like smoke screening and illumination are possible, as well as leaflets or bomblets. Modern Mortar rounds can be fitted with electronic proximity or very quick mechanical fuses. Also Anti-Tank-Guided Mortar-Rounds are in use.⁶

Unexploded mortar rounds may still contain propellant charge as well as the content described above. Mortar rounds must never be approached. Mortars are mostly indirect fire weapons, in that the people firing the weapon often cannot see their target, and it is fired at a high trajectory. As a result firing patterns can be indiscriminate and unexploded mortar rounds are found strewn across many battle areas. Unexploded or abandoned mortar rounds can also be used as the main charge of IEDs.

1.2.3 CLUSTER MUNITIONS, SUBMUNITIONS AND BOMBLETS

According to the Diplomatic Conference for the Adoption of a Convention on Cluster Munitions⁷, Cluster munition means a conventional munition that is designed to disperse or release explosive submunitions each weighing less than 20 kilograms, and includes those explosive submunitions. It does not mean the following:

- A munition or submunition designed to dispense flares,

⁶ e.g. 120 mm HEAT Mortar-Round "Bussard"

⁷ Diplomatic Conference for the Adoption of a Convention on Cluster Munitions DUBLIN 19 – 30 MAY 2008



PICTURE 1.19

Two 82 mm HE O-832D Mortar Rounds laying in an abandoned Armoured Fighting Vehicle. UNMAS Photo/Thomas Enke

PICTURE 1.20

Cluster bomb unit CBU-87. Some types can contain up to 800 individual submunitions. UNMAS Photo/Thomas Enke

smoke, pyrotechnics or chaff;

- A munition designed exclusively for an air defence role;
- A munition or submunition designed to produce electrical or electronic effects;
- A munition that, in order to avoid indiscriminate area effects and the risks posed by unexploded submunitions, has all of the following characteristics:
 - Each munition contains fewer than ten explosive submunitions;
 - Each explosive submunition weighs more than four kilograms;
 - Each explosive submunition is designed to detect and engage a single target object;
 - Each explosive submunition is equipped with an electronic self-destruction mechanism;
 - Each explosive submunition is equipped with an electronic self-deactivating feature.

Submunitions and bomblets are carried to the target area in cluster bombs, warheads of artillery rockets, or artillery rounds. These canisters burst open in mid-air over the target area, and scatter the submunitions over a wide area. A submunition can be an AP mine, a HEAT bomblet or a small bomb with several different fillers. The submunitions come in a variety of shapes and colours, such as the shape and size of tennis balls, butterflies or drink cans. They are also often brightly coloured.

Among UXO, submunitions represent a particularly dangerous threat due to their high volatility and dispersal over wide areas. Submunitions often fail and may remain hazardous for many years. Estimated rates of failure between five and 30 per cent

Case study

In 2006, Israeli use of cluster munitions against Hezbollah forces in Lebanon resulted in widespread international criticism. Israel was said to have fired significant quantities of cluster munitions — primarily during the last 3 days of the 34-day war. Reports maintain that Hezbollah fired about 113 “cluster rockets” at northern Israel and, in turn, Israeli-fired cluster munitions, supposedly affecting 26 per cent of southern Lebanon’s arable land and contaminated about 13 square miles with unexploded submunitions. One report states that there was a failure rate of upwards of 70 per cent of Israel’s cluster weapons.⁸

⁸ Cluster Munitions: Background and Issues for Congress, Andrew Feickert, Specialist in Military Ground Forces, Paul K. Kerr Analyst in Non-proliferation April 29, 2014

have been reported on several battlefields. This rate depends on various factors, but generally the softer the ground, the higher the failure rate. Unexploded submunition is highly sensitive and can detonate with very little contact. This ammunition is extremely dangerous and should never be approached. It can be found above or below the ground, and in and around buildings. Submunition may sometimes be found hung or caught up in trees, fences or on the roof of buildings.

When an area has been targeted with submunitions, there will sometimes be signs and indicators of this, such as packaging, small parachutes or very definite “splash marks” on the ground or buildings. In addition, any trees in the vicinity will show characteristic signs, such as treetops stripped of branches and foliage. In open areas there will usually be numerous small holes and a considerable amount of debris left behind, such as metal and plastic casing or small parachutes, as well as debris from the targets.

1.2.4 ROCKETS AND MISSILES

A rocket or a missile is an explosive device containing its own means of propulsion (the rocket motor) as well as explosives or other fillers (the warhead). Missiles are similar to rockets, although they are guided in their trajectory. Rockets and missiles can be fired from vehicles, ground-based launchers, or from the shoulder. They can also be launched from aircrafts, ships and submarines. Rockets and missiles are used to deliver high explosives or other payloads like submunitions, leaflets, chemical or biological materials at greater distances and with greater accuracy than just about any other type of weapon. The lethal range of explosion HE warhead of a rocket or missile varies enormously depending on the size



PICTURE 1.21
Various unexploded submunitions. Extremely unstable: BLU-97, DM1385, PTAB-2.5KO. UNMAS Photos/Thomas Enke

1.2 Unexploded ordnance

1.2.4 ROCKETS AND MISSILES

and nature of the warhead, but rockets and missiles typically have considerable destructive power, able to damage and destroy vehicles, buildings and even entire neighbourhoods.

Rockets and missiles come in many shapes and sizes, from the relatively small air-to-ground rocket S-5, around 80 cm long, to very large artillery missiles of more than 15 metres in length, like the 16,5 metres long RSD-10/SS-20 missile. Rockets and missiles are made of metal and are normally distinguishable by their long thin cylindrical shape. A rocket/missile is referred to according to its diameter. For example, a 122 mm BM-21 rocket has a diameter of 122 mm but has depending on the type a length of 2.87 metres or longer.

Unexploded rockets and missiles can be extremely dangerous, as disturbance may initiate any unspent rocket fuel, and propel the rocket in an unguided fashion. If the warhead is still intact, the explosive potential is equal to when the rocket or missile is initially launched, and even greater if the rocket or missile does not launch, but explodes with a full load of fuel.

Rocket fuel is also extremely corrosive, volatile and will burn exposed skin and can kill a person if the fumes are inhaled. Rocket fuel is also liable to explode if ignited. Some types of fuel will self-ignite on contact with air. For all these reasons, rockets and missiles should not be approached.

The remains of exploded rockets and missiles can contain gas-bottles with compressed gases which are needed for guidance or cooling the IR-seeker. Also hazardous pyrotechnic devices for guidance and arming can be found.



PICTURE 1.22

Two 122 mm HE rockets 9M22U laying in an Afghan village. UNMAS Photo/Thomas Enke

PICTURE 1.23

Remains of an exploded Anti-Tank Missile BGM-71A/TOW-1B. Also this scrap contains dangerous parts like filled gas bottles. UNMAS Photo/Thomas Enke

PICTURE 1.24

This is a S-75 Dwina/SA-2 missile as referred to in the case study; Iraq. UN Photo

Because of their slender shape, unexploded rockets and missiles (often broken into sections) can easily be mistaken for broken pipes. In certain conflicts involving heavily armed and technologically advanced powers, unexploded rockets and missiles can be massive in size, though such cases are relatively few in number.

1.2.5 AMMUNITION FOR GUNS

Currently this ammunition is used in a wide range of calibre from 20 mm up to 203 mm (8 inches). In the past larger calibres were used, up to 80 cm.⁹ These are used from weapons with different purposes, like artillery howitzers, anti-aircraft guns, tank-guns or recoilless rifles.

Artillery rounds are explosive devices, designed to be fired at a great distance (more than 100 km) and to explode either in the air above the target, or on impact. Artillery rounds can be fired from ground, sea, as well as air-based¹⁰ guns/howitzers. The artillery can fire directly or indirectly but, due to the large distance to the target, users of the weapons may not be able to see their target. The destructive capability of conventional artillery rounds largely depends on their size.

Projectiles of tank ammunition are mostly explosive devices designed to destroy tanks, bunkers or troops in the open. Tank rounds are normally used as direct fire weapons, but may be used as an indirect weapon that is fired from a great distance from the intended target.

⁹ German Railway Gun DORA, used in the II. World War.

¹⁰ AC-130 SPECTRE with 105 mm howitzer (USA)

Case study

Over 100 old Soviet surface-to-air missiles were found abandoned in Baghdad in 2003. Sitting on trailers and measuring nearly 11 metres, the missile trailers had been subject to looting by locals, and children were found playing at the different sites. The extremely corrosive propellant burned one child. Two missiles were also reported to ignite after being continuously tampered with, and one nearly destroyed three houses and killed a number of people. Adding to the destruction, the missile was fully fuelled, leading to an explosion nearly five times greater than with the warhead alone.

Report on SA-2 Missiles Iraq, Hess. R., Programme Manager WFP/ FSD Mine Action Response Teams, Baghdad, Iraq, 2003

1.2 Unexploded ordnance

1.2.5 AMMUNITION FOR GUNS

Artillery and Tank rounds, like very large bullets, are aerodynamically shaped with a tapered nose, cylindrical body and flat base. Most are made of metal. Tank rounds may also have fins at the rear of the projectile and/or a straight, protruding fuse at the nose.

Due to the construction and the purpose of the gun, the rounds and the propellant can be loaded separately or as a cartridge. Unexploded rounds can be found above or below ground or in rubble, and like other UXOs, may be rusted or discoloured with age and difficult to identify. Most rounds contain high explosives but some may contain white phosphorous, or even chemical and biological weapons. Artillery rounds can contain also submunitions like bomblets. Tank rounds could be made from depleted uranium.

Be aware that due to spin, UXOs will lose large parts of their colouring when impacting on the ground. Rust and dirt give a UXO the look more of a stone than of ammunition. Never touch suspicious objects.



PICTURE 1.25
British 12,000 lbs HE Bomb
from the Second World War,
found near a German dam.
UNMAS Photo/Thomas Enke

PICTURE 1.26
(Below) Examples of
artillery round and a
tank round. UNMAS
Photos/Thomas Enke



Unexploded or abandoned artillery rounds can be used as a main charge of an IED.

1.2.6 BOMBS

A bomb is an explosive device, usually dropped from aircraft, but conversions to warheads of artillery rockets are known¹¹. Bombs come in many different shapes and sizes.

Bombs are usually made of metal and have a smooth curved, normally aerodynamic shape. Air-delivered bombs can range in size from 25 kg to 5,000 kg and can be as long as three-and-a-half metres (around 12 feet). They are typically grey, green or brown in colour. Mostly the bombs contain HE, but other payloads like sets with flashlights, chemical agents or white phosphorous will be possible.

Like other UXOs, bombs wear with age and exposure to the elements. They may be rusted, discoloured, and partially hidden by dirt or debris.

Typical signs of bombing activity include large craters in the ground. Unexploded bombs may be found above or below the ground. They can penetrate up to 35 metres deep into the ground without exploding.

Case study

About 100,000 unexploded bombs have been uncovered in Germany since the end of Second World War. Often the bombs are up to 250 kg. Some bombs are much larger. Bombs with a mass of 10 tons were used to destroy bridges and barriers. Thousands of bombs have penetrated the ground so deeply as to remain undiscovered for years. New technologies and the issue of reconnaissance pictures and maps lead to new finds every year. Currently 5,500 bombs are found and disposed per year.

¹¹ KREMA I, KREMA II and KREMA IV with bombs from 50 lbs up to 500 lbs

1.2.7 FUSES

A fuse is the functioning component of ammunition that allows the ammunition to detonate or function as designed when used.

The main types of fuses are:

- Impact (point detonating) fuses;
- Time fuses and
- Proximity fuses.

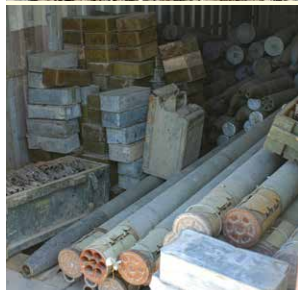
Fuses may or may not have a self-destruct feature. Several combinations are possible, e.g. fuses with time and impact function.

Fuses are fitted for every kind of filler contained in ammunition.

They form the tip or “nose” of an artillery or mortar round, resembling a cone. Base-detonating fuses will be used in penetrating ammunition, like deep penetrating bombs, or shaped charges contained in anti-tank ammunition. In the case of landmines, it may be a small circular “cap” that sits on top or inside of a landmine. Fuses may have visible springs or pins.

A fuse may become detached from its main explosive device or munition, and may simply be left lying around. A fuse can be very small, but is nonetheless potentially dangerous and can even be lethal.

Fuses can be large or small and work on a number of different principles: pressure, pressure-release, mechanical rotation or deflection, light sensitivity, heat sensitivity, and so on. With different shapes and colours, fuses do not immediately appear dangerous but many are recognizable as a piece of military



PICTURE 1.27
Field of unused (Training-) Bombs P-50Sh in Afghanistan. UNMAS Photo/Thomas Enke

PICTURE 1.28
Examples of artillery round and a tank round. UNMAS Photo/Thomas Enke

PICTURE 1.29
Abandoned ordnance found in Afghanistan. UNMAS Photo/Thomas Enke

1.3 Abandoned ordnance

equipment. They are normally metal and metallic in colouring, but may also be green, brown and other military colours.

1.3 Abandoned ordnance

Post-conflict settings can be the site of arms caches and weapons depots, or dumps full of Abandoned Ordnance (AO). AO is ordnance that has not been used, but is no longer in the control of any particular force. AO includes every kind of ammunition such as mortar rounds, grenades, bombs, rockets, artillery rounds and others.

Caches of abandoned ordnance and poorly secured or maintained stockpiled munitions, sometimes located in or near communities, in military buildings, public buildings, schools, houses and so on, can produce catastrophic explosions. Poorly stored or maintained munitions may become more sensitive and suddenly explode. Absence of lightning rods or safety regulations, high temperatures and humidity can all increase the risk of explosions. Intense heat from fires can also cause abandoned ordnance to detonate. Small caches of abandoned ordnance may continue to be discovered years after a conflict has ended. In Cambodia for example, small caches of ordnance that have been abandoned, forgotten or lost continue to be discovered for more than 30 years.

Getting authorities to secure these sites is essential but may be difficult to achieve in the short term. Disposing or securing large quantities of abandoned ordnance is also complex and is usually the responsibility of security forces. This may be outside the responsibility of a standard mine action programme.



PICTURE 1.30
Abandoned 122 mm
Rocket launcher, partially
loaded; Afghanistan.
UNMAS Photo/Thomas Enke

PICTURE 1.31
Conventional Munitions
Risk Education in Rejaf,
South Sudan.
UN Photo/JC McIlwaine

1.4

Improvised explosive devices and booby traps

Abandoned military vehicles, weapons (such as artillery guns and tanks), and buildings may also contain abandoned ordnance, extremely volatile rocket fuels and ingredients such as chemicals and depleted uranium. Additional to the hazard of the ammunition the securing of weapon and ammunition caches with booby traps is common.

1.4 Improvised explosive devices and booby traps

An IED is a manually placed explosive device, normally home-made and adapted in some way to kill, injure, damage property or create terror. Often UXO or abandoned munitions are modified to construct IEDs, which can then be detonated accidentally by the victim, by remote means (radio controlled, command wire, etc.) or as a suicide attack.

A Booby Trap is an explosive or non-explosive device, deliberately placed to cause casualties when an apparently harmless object is disturbed or a normally safe act is performed, like opening a door or turning on a television. Booby traps – most often victim-activated – are usually common objects found in unusual settings – in other words, they are out of place.

IEDs and booby traps are often developed by militant opposite forces who have relatively limited access to weapons or who want to have deniability of their attacks. Sometimes they are placed with the intention of causing harm or injury to combatants and non-combatants alike, being hidden in vehicles, on roadsides or in private homes and so forth.

Did you know?

The use of booby traps is regulated by international humanitarian law. Protocol II of the Convention on Certain Conventional Weapons (CCW) outlines situations when such devices cannot be used and offers provisions on the recording and removal of booby traps after hostilities have ended.



PICTURE 1.32
IED made from a Cooking Pot; Afghanistan.
UNMAS Photo/Thomas Enke

1.4 Improvised explosive devices and booby traps

The use of Home-made Explosives (HME) leads to an additional hazard of IEDs. In general HME is more sensitive against friction and less durable than commercial or military explosive. Due to the absence of suitable raw material and tools the construction of an IED doesn't have the safety standard of industrial manufactured ammunition. There is no need to approach, touch or tamper with a booby trap or an IED.

Almost any objects can be made into a booby trap or an IED. Mines can be booby trapped to make their removal more difficult. Booby traps and IEDs can be found just about anywhere and can look like any object. Even dead bodies can be booby-trapped with the intention of inflicting injury on those who attempt to remove them. Booby traps and IEDs are normally intended to be undetectable. They are designed to catch the helpful, the unwary and the curious.



PICTURE 1.33

Anti-handling device: A grenade was placed under the stick of this fragmentation mine. Had the soldier or deminer simply defused the mine and pulled the stick he would have activated the grenade; Balkans.

Photo/German Forces

PICTURE 1.34

A person entering this room through the door will activate the hand grenade connected with a tripwire; Balkans.

Photo/German Forces

1.4 Improvised explosive devices and booby traps

Mortar rounds, hand grenades and other ammunition can be manufactured by individuals from different products, such as empty ammunition boxes, drill ammunition and commercial objects. Very common are Molotov cocktails, partially designed to fire like a rifle grenade. Sometimes it is very difficult to determine between a hazardous item, and an object for common use.



PICTURE 1.35

An improvised rifle grenade and a hand grenade made from an empty case; Balkans.
UNMAS Photos/Thomas Enke

**If you have not
dropped it,
don't pick it up!
Be careful of
objects of
interest beside
the road.**



JAMAM ONE SKETCH
MAP

Scale 1:250



South Sudan
UNMAS Photo





SECTION 2

Recognizing dangerous areas



Recognizing Dangerous Areas

Mined areas are often not visibly different from mine-free areas, as they may not be marked with any particular warning signs. As a rule, mines are often impossible to see; they are usually buried, or concealed in undergrowth.¹² Areas contaminated with other ERW may be more obvious, as there may be visible ammunition casings on the ground, unexploded ordnance, and so on. Booby traps and IEDs are mostly invisible, but the behaviour of the population and the recognition of markers and ground signs can assist to avoid a possible dangerous area. This section is intended to help readers recognize warning signs and clues. Constant vigilance will help you identify and steer clear of potentially dangerous areas.

2.1 Warning signs

Normally people who lay mines do not leave clear signs to indicate the presence of mines, but someone else may leave a temporary sign as a warning to others, or mine clearance agencies may erect official signs.

You should be aware of the most common types of warning signs used in areas where you live and work, and always keep an eye out for these signs. But the lack of clear warning signs does not mean an area is safe from mines, UXOs, ERW, booby traps

¹² Sections 2-3 are originally adapted from United Nations Training Modules for Mine Awareness Community Facilitators and Programme Managers, UNICEF 1999, modified from UNMAS 2015.

Did you know?

Armed forces are required to record all minefields, mined areas, mines and booby traps under CCW Protocol II. The Mine Ban Convention and Protocol V of the CCW also outline measures for recording and marking mined areas prior to clearance taking place.



UN Photo



Photo/German Forces



Photo/German Forces

2.1

Warning signs

2.1.1 OFFICIAL WARNING SIGNS

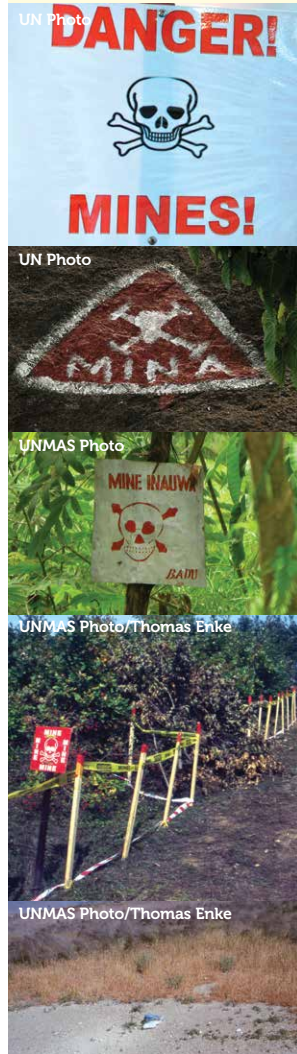
or IEDs. People sometimes remove warning signs, signs may be temporary, may have not been maintained or may never have been erected in the first place.

2.1.1 OFFICIAL WARNING SIGNS

Sometimes you will come across official signs, erected by a government, a non-governmental organization (NGO), a United Nations agency or by some other organization, to warn you that mines or other explosive hazards are in the area. These warning signs may differ from one country to another, but are normally bright red, square or triangular in shape, and made of metal, concrete, wood or plastic. The most common ways of marking a mined- or ERW-affected area with official signs are:

- Skull and crossbones sign in red and white, rarely yellow and black, often with the words “DANGER MINES” in English and/or the local language;
- The word “MINE” or “EXPLOSIVES” in English and/or the local language;
- Rope or tape, usually coloured either yellow, red or blue;
- A red triangle, sometimes with a black dot or the word “mine” in the centre and
- A concrete or wooden post, painted red on one side and white on the other. The red side indicates the side that is dangerous.

A conventional army sometimes uses barbed wire or high fences to section off an area of important military interest, especially around permanently strategic points like airports or ammunition depots. Additionally these fences can be protected with mines.



PICTURE 2.1

Official mine signs.

In absence of suitable material official warning signs could look more improvised. Red or blue painted stones could also be a serious warning.

All warning signs are subject to deterioration over time, meaning you must be observant. Signs may have fallen down, rusted away or become covered in vegetation or (seasonally) by snow. Poor construction materials along with low quality paint often result in signs becoming dislodged, broken or badly faded. Signs are also often stolen or not properly maintained or replaced.

Mine action programmes should use barbed wire or fences to warn and keep the local population from entering dangerous areas.

2.1.2 UNOFFICIAL (IMPROVISED) WARNING SIGNS

In addition to official signs designed to warn people, conventional army and other official responsible persons may use signs to indicate areas they have surveyed as dangerous and which they plan to clear or are in the process of clearing. In Afghanistan, such areas are marked with rocks painted red to indicate uncleared areas, and painted white to show areas that are clear. Also buildings, roads and trees may be painted red or white with map coordinates and minefield numbers, indicating that the area may be dangerous and has been surveyed.



PICTURE 2.1 (Continued)
Official mine signs.



PICTURE 2.2
Some military installations are secured with mines, here a "mine fence" seen in Afghanistan. UNMAS Photo/Thomas Enke

2.1

Warning signs

2.1.2 UNOFFICIAL (IMPROVISED) WARNING SIGNS

In the absence of official signs, local people often develop their own techniques and signs for marking dangerous areas. Such techniques vary from one country to the next and even vary in different parts of the same country. With local signs there are no hard and fast rules and they are often only obvious to local people. Such signs nonetheless have some common characteristics to represent danger ahead, and may include:

- A piece of cloth or plastic bag tied to a fence or tree;
- A can on a post;
- Small piles or circles of rocks;
- Rocks laid across a path;
- A clump of grass that has been tied in the middle;
- Sticks which have been tied to form a cross, then placed across a path or placed in the ground next to a path;
- Signs which have been cut into the bark of a tree and
- A shorn-off branch.

Because of their improvised nature, local signs often do not give a clue as to the precise location or particular nature of the threat. Imagine coming along a road or a path where you encounter a barrier. How will you know whether you are in front of the threat or already inside the hazardous area? Look for other indicators and consult with local people. Often these signs can also be used to represent other types of danger, like a damaged bridge, a pothole in the road and so on. Whatever the meaning, these local signs represent danger, and caution should always be exercised.



PICTURE 2.3

Unofficial improvised mine signs. UNMAS
Photos/Thomas Enke

Never go into areas marked by mine warning signs, wires or tapes! Always respect mine warning signs!

Update your mine/ERW information on a regular basis.

2.2 Warning clues

Mines, ERW and IEDs may be found in numerous types of areas where fighting has taken place, or that are of strategic importance to combatants. Because most hazardous areas are not marked with official warning signs you will often have to look for other clues to tell you that an area may be hazardous. The following are some tell-tale signs to identify a dangerous area:

- Visible mines, ERW and IEDs;
- Signs of fighting or military activity;
- Signs in the environment, dead animals, unusual objects and
- Local behaviour.

2.2.1 VISIBLE MINES, ERW AND IEDS

2.2.1.1 The edge of a buried mine, protruding metal and wooden stakes

In addition to being extremely difficult (if not impossible) to see, mines are almost always purposely camouflaged and, to compound the problem, their location is often buried, obscured by long grass or thick brush. However, certain landmines that are laid above ground may be visible after careful scrutiny of the area. Erosion or natural forces can also uncover or partially uncover landmines. Snow, which hides even surface-laid mines, has obvious implications, as does the subsequent snowmelt. But be aware, erosion and natural forces can also have the effect to bury a landmine. If you are in an area you suspect could be contaminated, and you can see any portion of an object that appears to be made of plastic or metal, and cannot be



PICTURE 2.3 (Continued)
Unofficial improvised mine signs.

2.2

Warning clues

2.2.1 VISIBLE MINES, ERW AND IEDS

identified as safe, you should assume the area is mine or UXO-contaminated. Wooden and metal stakes about 30 cm in length would also indicate the potential presence of certain types of above ground mines.

Landmines are seldom planted in isolation, so evidence of one mine would indicate the potential presence of others in the area.

2.2.1.2 Abandoned and unexploded ordnance

Areas contaminated with abandoned and unexploded ordnance may be more obvious than those affected by mines, but the presence of such devices will often indicate the presence of mines as well. You may see ammunition casings on the ground, unexploded mortar or artillery rounds and grenades, boxes containing unused ammunition and weapons. These are signs that fighting has taken place, and are an indication that mines and ERW may be in the area.

2.2.2.2 Pieces of wire or tape strewn about

Certain types of mines and also some types of IEDs and booby traps require the use of tripwires or electrical wires. If you see pieces of wire lying about in an area known to have experienced fighting, it indicates that mines, IEDs or booby traps may have been used. Tripwires are usually strung across paths, trails, roadways, fields and other areas in which foot traffic could be expected. Remember that tripwires are extremely difficult to see and just because they are not visible, does not mean they are not around.



PICTURE 2.4

Stake AP mines are sometimes visible, note the wire, PMR-U; Balkans. UN Photo

Do not attempt marking if you have not received proper training through practical exercises! Always be alert for things that look "out of place"! Don't take risks! If you are in any doubt, turn back!

2.2.2.3 Tilt rods and fuses

Sometimes you may see tilt rods or fuses above ground. This usually indicates the presence of anti-vehicle mines, but may also indicate anti-personnel mines in the area.

Fuses can become detached from an explosive device or munition, or may simply be left lying on the ground without being fitted. A fuse can be very small, but is nonetheless potentially dangerous and can even be deadly. They indicate fighting, the presence of mines and ERW.

2.2.2.4 Discarded packaging, wrapping and military debris

Occasionally forces lay mines in a hurry, and leave the packaging, tripwire spools and safety pins from the mines. If you see wooden, plastic or metal containers that have military markings lying around, always be suspicious of mines in the area. Also, any small metal rings with a metal pin attached should be viewed as a sign of possible mine activity in the area. Empty cluster bomb containers found in a conflict area also indicate danger.

Never approach, touch or tamper with explosive remnants of war!



PICTURE 2.5

A cover of a submunition BLU-97, a really good indicator for an unsafe area. UNMAS Photo/Thomas Enke

PICTURE 2.6

An UXO is often visible. Here a dangerous part of an 82 mm Mortar-Round HE83LD; Afghanistan. UNMAS Photo/Thomas Enke

Stay away from abandoned military equipment!

2.3 Signs of fighting or military activity

2.3.1 TRENCHES, DYKES, BUNKERS OR BATTLE POSITIONS

2.3 Signs of fighting or military activity

2.3.1 TRENCHES, DYKES, BUNKERS OR BATTLE POSITIONS

Any areas occupied by combatants, especially trenches, bunkers or battle positions, would likely have been mined as a protection from attack. Abandoned military facilities could be booby-trapped to deny their use. Also there would be a strong possibility of the presence of UXO and abandoned munitions.

2.3.2 DAMAGED, ABANDONED OR DESTROYED CIVILIAN AND MILITARY VEHICLES.

A damaged, abandoned or destroyed civilian or military vehicle could indicate the presence of UXO, anti-vehicle or even anti-personnel mines. Where there is one mine, there are usually several others. You might also encounter pieces of metal or debris that look like they are the results of an explosion. Abandoned vehicles may also be booby-trapped. Vehicles could contain abandoned ordnance, toxic fuels or chemical residues. Damages by fire could be an indication of ammunition containing depleted uranium. Remains of explosives are not excluded. These are clear indications of danger and should be avoided.

2.3.3 DISCARDED AND ABANDONED WEAPONS

Discarded weapons indicate recent fighting in the area, and contain hazards like abandoned or destroyed vehicles. Sometimes the weapons are loaded and ready to fire, and the ammunition can be damaged. Do not approach such weapons.



PICTURE 2.7
Discarded ammunition box in an abandoned house; Balkans. UNMAS Photo/Thomas Enke

PICTURE 2.8
Deserted trench. Note stake fragmentation mine PMR-U with tripwire; Balkans. UN Photo

PICTURE 2.9
Signs of fighting: Empty cartridge cases of the 75 mm x 406 Recoilless Rifle; Balkans. UNMAS Photo/Thomas Enke

2.3 Signs of fighting or military activity

2.3.4 MILITARY CHECKPOINTS AND BORDER AREAS

2.3.4 MILITARY CHECKPOINTS AND BORDER AREAS

The longer combatants occupy any area, the more likely they have protected themselves by laying mines in the immediate surrounding areas. In many countries, minefields are placed along international, and sometimes internal administrative, borders (such as provinces and district borders) to prevent infiltration. These areas are often the last to be cleared of landmines, especially if the tensions between neighbouring countries or internal conflicts are not completely resolved.

2.3.5 AROUND MILITARY BUILDINGS AND INSTALLATIONS

Mines are most often used as defensive weapons. Therefore, any military installation or building, or any area occupied by combatants, may have been mined or booby trapped as a protective measure against attack, or mined after occupation so as to prevent use of the facility by the opposing side. Fences, entries and important infrastructure inside a camp, like power stations, could be strengthened with a minefield. Such facilities may also contain large stockpiles of abandoned munitions.

2.3.6 BRIDGES, DAMS AND SURROUNDING AREAS

Mines are also used to stop or alter the movement of opposing forces. Mining bridges, dams and surrounding areas can block the travel route of opposing soldiers and deny them valuable resources. It is important not to walk around or under the entrance of bridges in heavily mined areas.



PICTURE 2.10
Abandoned Main Battle Tank, safe? Afghanistan. UNMAS Photo/Thomas Enke

PICTURE 2.11
This observation point could be surrounded with mines. UNMAS Photo/Thomas Enke

PICTURE 2.12
Be aware, military facilities could be strengthened with a fence and more; Former Yugoslavia. UNMAS Photo/Thomas Enke

2.3 Signs of fighting or military activity

2.3.7 ROADS AND PATHS

IEDs are often placed at so called “Vulnerable Points”. These points are also named as “Slowdown Points”. Bridges are slowdown points that have a lot of space for a huge mass of explosives, as well as culverts and other items, which can be used for markers. In connection with good lines of sight and safe firing points, bridges are excellent locations for an ambush.

2.3.7 ROADS AND PATHS

Strategic roads and tracks are often mined to stop movement of troops or commercial traffic. Roads that are damaged or blocked often force vehicles off the roadway and onto the shoulders. The edges and shoulders of roads are sometimes mined as a choke point. Sometimes the tarmac of the road is soaked with diesel fuel to dig a hole and insert a mine or an IED into the road. Their round patches (and maybe a line for the command wire) can be seen on the pavement. Similarly small pathways that traverse conflict areas may be mined.

PICTURE 2.13

(Left) Why is this obstacle in the road? To force you to drive off the hard track and onto the soft ground, which is easy to mine. Can you see the mine about two metres to your left? Former Yugoslavia.

UN Photo

PICTURE 2.14

(Right) The use of ammunition as building materials is a common procedure in post-conflict countries. Here a 122 mm Artillery Rocket used as a lintel; Afghanistan.

UNMAS Photos/Thomas Enke



2.3 Signs of fighting or military activity

2.3.8 AIRPORTS AND RAILWAY TRACKS

Bottlenecks are slowdown points, such as blind corners, narrow roads and paths with dense vegetation or rocks. In connection with a good line of sight and safe firing points bottlenecks are excellent locations for an ambush.

2.3.8 AIRPORTS AND RAILWAY TRACKS

As is the case with bridges, airports and railway tracks are very important means of transportation and key strategic areas for the military. As such, they are often mined. Fences and signs could be broken or removed; gates and official entries abandoned, but secured with mines or booby traps.

2.3.9 ELECTRICAL POWER AND WATER SUPPLY

Electrical power plants, power lines and substations are of great strategic importance during wartime. Cutting off an enemy's power supply can seriously affect the ability to move and communicate. Also dams and waterworks can be used for supply of the population or for flooding an area to deny this from the enemy. Therefore, these areas are often protected using mines.

2.3.10 SHADED AREAS, FRUIT TREES, WATER SOURCES, WELLS AND RIVER BANKS, CAVE ENTRANCES

Soldiers, members of opposite militant forces, as well as civilians in battle, will often seek areas that offer shade or shelter from the elements as well as to reduce their visibility. They will also try to secure their access to water and food sources and often defend such areas with mines.

Do not drive onto the shoulders of a road.



PICTURE 2.15
An abandoned bridge and an unknown ford, safe? Balkans. UNMAS Photo/Thomas Enke

PICTURE 2.16
A 100 mm x 695 Cartridge Case used as building-material; Afghanistan. UNMAS Photo/Thomas Enke

2.4 Signs in the environment

2.4.1 GROUND SIGNS: CHANGES OF VEGETATION AND SOIL

Larger gatherings of people, well known meeting points and areas with a high volume of traffic could be very suitable for an IED target.

2.3.11 BUILT-UP AREAS

Building materials like lintels are often raw materials. Sometimes the population uses large ERW or UXOs, like artillery rockets or cartridge cases, as raw materials to maintain and improve their buildings. Lintels, stairways and walls could all contain hazardous ammunition.

2.4 Signs in the environment, dead animals and unusual objects

2.4.1 GROUND SIGNS: CHANGES OF VEGETATION AND SOIL

Ground signs could indicate the present of mines. The colour of the vegetation shows patches of dried plants. In sandy areas the soil can show patches of not typical soil formation. If a minefield has been in existence for some time, there might be a visible pattern of slight depressions over the mine where the once loosened soil has settled after a rainfall. In some cases, small mounds of earth may be present that could indicate recent digging activity, though such evidence will disappear quickly.

If a mine has been laid recently, there might be patches of dead grass where the roots have been cut when the mines were buried. If a mine was laid very recently, the moist soil used to cover the landmine when it was buried may show up darker than the surrounding area



PICTURE 2.17
An UN truck hit an AV mine; Mali. UN Photo

PICTURE 2.18
Destroyed or deserted houses may be mined or booby trapped; Kosovo. UNMAS Photo/Thomas Enke

2.4

Signs in the environment

2.4.2 DESERTED VILLAGES AND OVERGROWN AREAS

Also IEDs can be buried near the road at vulnerable points (choke points) and show similar ground signs.

2.4.2 DESERTED VILLAGES AND OVERGROWN AREAS

Villages and towns that have been abandoned, or fields that are no longer used, indicate the strong likelihood of mines or ERW in the area. After a cluster bomb strike, or an artillery attack with bomblet ammunition, the area would be hazardously contaminated in the same way as a minefield.

2.4.3 ABANDONED AND DESTROYED BUILDINGS AND HOUSES

Often soldiers or combatants of opposite militant forces will mine houses for defence or leave behind mines or booby traps in abandoned houses, to trick other soldiers or combatants who are seeking shelter. If a house has clearly been damaged or destroyed through fighting, and is uninhabited, there is every possibility that UXOs may also remain. Abandoned and solitary buildings and houses can be used as weapon and ammunition caches, and potentially secured with mines or booby traps.

2.4.4 LOG OR BRANCHES PLACED ACROSS A ROAD OR PATH (AN AMBUSH BARRICADE)

Sometimes combatants will lay a barricade across a road to stop vehicles at an illegal checkpoint, or even force them off the road into the surrounding area, which may have been mined or contaminated with UXO.



PICTURE 2.19

Not all explosion craters come with a warning sign. Where there is one exploded mine, ERW or IED you must assume that there are others in the vicinity; Afghanistan. UNMAS Photo/Thomas Enke

PICTURE 2.20

A typical cluster munition strike with lots of blinds; Kosovo. UNMAS Photo/Thomas Enke

2.4 Signs in the environment

2.4.5 EXPLOSION CRATERS

Otherwise this barricade can be to prevent people from entering an unsafe road or path. A safe decision would be to use another road or path.

2.4.5 EXPLOSION CRATERS

Craters from explosions or regular signs of repair on tarmac roads may be visible indicators, usually for anti-vehicle mines or signs of a battle. Be careful in surrounding areas as other mines may not have been cleared or may have been overlooked. In particular, never stray off pavements onto the soft shoulder or adjacent ground.

Shelling with mortar rounds, grenades or the use of cluster bombs also leaves particular signs of damage on buildings, on road tarmac, or “decapitated” trees. Sometimes the impression looks like a splash mark carved into the tarmac.

Maintenance on tarmac or road could also be a hint of buried Command Wire (CW) IEDs. If there is an additional small groove leading from the “repaired” patch to the shoulder of the road it will be a real indicator for a CW IED.

2.4.6 PATCHES OF GROWTH

In drier areas, some places where mines are buried become greener or have grass and plants growing over them. This is because metal cased mines form condensation on them during the night, which then gives the plants more water than the surrounding soil.



PICTURE 2.21
Effect of an AP mine MRUD to a car; Balkans.
UN Photo

PICTURE 2.22
Aftermath of a mine incident with a TM-58 AV mine on a roadside in Afghanistan. UNMAS Photo/Thomas Enke

2.4.7 UNUSED OR OVERGROWN PATHS, ROADS OR FIELDS

If an area is clearly unused and overgrown or no one has travelled over an area in some time, the reason could be because of mines or UXO. If an area is not cultivated, in contrast to other plots around it that are being farmed, assume the area is mined or contaminated with UXO. Also abandoned weapons and ammunition caches could be found buried in overgrown fields, sometimes secured with booby traps and mines. When in doubt, use only tracks or roads that appear well travelled.

2.4.8 ANIMAL CARCASSES OR SKELETONS

The skeleton or body of an animal or person which has been left to lie could indicate a minefield. Be aware that an injured animal or person can move over a long distance after the accident occurred. Look for additional clues. Be aware that corpses could be wearing ammunition like hand grenades, which could be in an unsafe condition after an explosion. Also corpses can be booby-trapped to secure against recovery of the body.

2.4.9 ANY OBJECT THAT APPEARS “OUT OF PLACE”

In an area of on-going conflict, if you see something unusual, of interest or of value by the side of the road, always remember that it may be booby-trapped. Booby traps are intended to lure and trick someone into moving an object and detonating the trap. If you don't know to whom an object belongs and you're travelling through a suspicious area, the smart approach is to not approach it at all.

2.5 Local Behaviour

Piles of abandoned ordnance could contain unsafe ammunition or have been known to be improvised into a single explosive device, which can be detonated by remote control. Out of curiosity people sometimes move closer to investigate these objects; this can be extremely dangerous.

2.5 Local behaviour

Local Behaviour can give a lot of clues about minefields, UXO-contaminated areas or possible IED attacks. A critical observation of the local population in addition to other hints could help to assess an area, building or situation.



Democratic Republic of the Congo
UNMAS Photo/Marc Vaillant

2.5.1 FORBIDDEN AREAS AND VILLAGE DEMINERS

Never go anywhere where the local population refuses to go, whether along a road or path, or to villages or fields. Such areas will usually appear abandoned, unused or uninhabited. Local populations often (though not always) know what areas are dangerous because they have witnessed fighting, suffered casualties, observed mines being laid and/or because they may have even laid mines themselves. Returning refugees or displaced people may not have the necessary information, as opposed to the local populations who have resided in the risk area during the conflict. It is better to seek advice from people who have been in the area for a longer period of time.

In certain cases, you may even come across villagers who are undertaking mine clearance without the assistance of mine clearance organizations. It is important to get information from these people about possibly affected areas, but it is also important to keep away from their demining work.

2.5.2 UNTYPICAL BEHAVIOUR

The local population reacts to changes in their surroundings. If there is danger they will avoid it. Empty streets with less than usual or no pedestrians and low traffic on a normally well-used road are untypical in all areas of the world. Shopping areas and gas stations without customers at popular shopping times should lead to some questions about the local behaviour and the reason why. An IED attack or an ambush cannot be excluded, at any time.



PICTURE 2.23

An untypical “empty” road on a weekday?

Does the population know something about an ambush? Balkans and Afghanistan. UNMAS

Photo/Thomas Enke

2.5.3 SCRAP METAL YARDS AND FISHING

UXOs and ERW are a very expensive raw material. For example, an artillery round contains steel, brass and explosives. In countries of extreme poverty, and where large quantities of UXOs/ERW exist, people will often collect and recycle the metal casings of the ammunition and try to extract the explosive. As a result some scrap metal yards may contain UXO or ERW, after the treatment by the population, which will be in an unsafe condition.

You may even hear stories about people fishing with landmines, ERW and UXO. Such stories are a strong indication of mined land and abandoned ammunition caches in the area.



PICTURE 2.24

UXO scrap collectors on a demolition site in Afghanistan. UNMAS Photo/Thomas Enke

PICTURE 2.25

Scrap metal collection yards can contain ERW, and can be a dangerous place; Afghanistan. UNMAS Photo/Thomas Enke





SECTION 3

**Basic
safety advice**

Basic safety advice

Once you have seen any of the following during your travels through the countryside or a particular area, you may be already at risk. Preventive actions are essential to maintain safety for you and your staff.

- Any kind of abandoned ammunition like landmines, ERW, UXOs or IEDs (or their components),
- Mine warning clues like official or unofficial warning signs (a can on a post or a circle of stones),
- Indications of battle like battle positions or abandoned and destroyed buildings or
- Any untypical behaviour of the local population.

There are some basic strategies to avoid exposure to these threats. This section focuses on preventive measures to be practiced by organizations and individuals working in high-risk areas.

To recap, here are some basic pointers from previous sections, which summarize the nature of the threat:

- All explosive hazards, mines, abandoned and unexploded ordnance, booby traps, abandoned IEDs and fuses are very powerful explosives, capable of killing or inflicting severe wounds to people and destroying vehicles;
- They can pose a threat years after a conflict has ended;
- They can explode at even the slightest touch;
- Over time, they can change colour, become rusty and shift position because of exposure to, and the effects of, weather;



PICTURE 3.1
One for the album? The ISAF soldier taking a photo is taking an unacceptable risk; Afghanistan. UNMAS Photo/Thomas Enke



PICTURE 3.2
Abandoned military equipment. Booby-trapped? Balkans. UNMAS Photo/Thomas Enke

3.1 Risk-taking behaviour

3.1.1 INTENTIONAL RISK-TAKERS

- Most affected areas are not marked with official warning signs or even improvised signs;
- Mines, explosive remnants of war (ERW) and (abandoned) IEDs are difficult to spot;
- They can be buried under the ground or hidden in tall grass, trees, along river banks, in buildings and vehicles, and even under water;
- They are found where fighting has taken place, or at strategic military positions;
- The fact that someone has moved a mine or ERW, or travelled in an affected area, does not mean it is safe.

3.1 Risk-taking behaviour

A landmine is an explosive device designed to destroy or damage

To understand safe behaviour in a dangerous area and how to prevent exposure to risk, it is important to have an idea of some of the main reasons why accidents happen to people working in war-affected environments. It is not always a simple matter of chance or accident, and among people working in dangerous areas there are a number of common causes of accidents.

3.1.1 INTENTIONAL RISK-TAKERS

This is a group of people who have knowingly entered a dangerous area or have attempted to touch an object known to be dangerous. There are a number of reasons why an individual would take such a risk.

Case study

In April 2003, a 31-year-old journalist, travelling with a cameraman in northern Iraq, stepped on a landmine, while being led to an abandoned Iraqi trench by a Kurdish soldier. The cameraman died immediately, while the journalist suffered such severe injuries, his lower leg had to be amputated.

3.1 Risk-taking behaviour

3.1.1 INTENTIONAL RISK-TAKERS

Some working in areas affected by armed conflict collect war souvenirs to show their family and friends. Included among the objects collected are mine warning signs and components of mines and UXO, which they believe to be harmless. These people also like to have photographs taken on abandoned or destroyed tanks and around military hardware. This behaviour, while alarming, is actually quite common among people working in affected environments, particularly staff with little experience in conflict areas. They are attracted to the novelty of abandoned and destroyed military equipment.

In the western countries there is a huge market for military equipment, particularly for every kind of ammunition. At flea markets high prices are paid for cartridge-cases, artillery rounds and fuses. Mostly this ammunition is not officially free from any hazardous content and not certified by an official 'free from explosives' certification provider.

Others are either careless or adventure seekers. They do not have a full appreciation for the scope of the threat, and are cavalier regarding the possibility that an accident could happen to them. This group often includes:

- People who may have been exposed to the threat for long periods;
- People who no longer have a clear perspective of the threat and
- People who are overconfident in managing risk.

These individuals will often expose themselves to risk with a sense of bravado and without clearly considering the dangers.



PICTURE 3.3

Why explore this tank?
It could contain unsafe ammunition and the risk of the contamination with depleted uranium. UNMAS
Photo/Thomas Enke

PICTURE 3.4

Beware of strange objects along the roadside. Note the protruding wire from the back, this is an IED; Iraq.
UN Photo

PICTURE 3.5

Is it safe to drive on?
Have the submunition or bomblets been cleared?
Make sure you and your car stay on the tarmac in such an ERW-affected environment.
Photo/German Forces

3.1 Risk-taking behaviour

3.1.2 UNINTENTIONAL RISK-TAKERS

Another category, though less common among experienced workers, are people who claim to know all about mines, ERW, UXOs and IEDs. Such people are often military enthusiasts who sometimes like to prove or demonstrate to others the extent of their knowledge about ammunition. Often, such enthusiasts like to visit and explore ex-military installations and collect souvenirs. Note that people with common sense are often better at preventing accidents than those who claim to know it all.

3.1.2 UNINTENTIONAL RISK-TAKERS

People who encounter mines, ERW and IEDs often do so by accident or by necessity. Many do not willingly enter dangerous areas or touch objects that are dangerous. Their work might require them to enter dangerous areas; it might require them to undertake construction work for example, which exposes them to the possibility of striking a mine with digging equipment. Unintentional risk takers are the easiest to reach with safety messages and safety planning, as they tend to have a greater sense of responsibility, are cautious, and are concerned about the well being of themselves and their colleagues.

While people can be curious about certain areas and objects without fully understanding the danger, curiosity can unintentionally put many people at risk. Sometimes people have been badly informed and rely on inaccurate information about the nature of the threat. Many myths exist regarding mines, ERW, UXOs and IEDs that can lead people to practice unsafe behaviour. Some of the more common myths follow.

Case study

In 2003, a journalist returning home after a visit to Iraq decided to keep two submunitions as a souvenir of his time there. He found the submunitions near a bombed vehicle in Baghdad and kept both with him for at least 20 days before he departed the country. While on route home, security staff in the international airport in Jordan detected one of the devices with an X-ray machine. During a manual search of his luggage the submunition exploded. One airport staff member was killed instantly as a result of the accident, while three others were wounded. The second device was in possession of his colleague and was safely defused in a controlled explosion. The journalist had believed that the devices were not armed and were safe.

3.2 Common myths about mines and explosive remnants of war

Myth There is a type of mine that will arm when you step on it and then blow up only when you take your foot off. This can allow you time to find a heavy object to place on the mine as you remove your foot.

Truth This happens only in movies.

Myth If you know a mine or UXO contaminated area has been walked on already, you can safely walk over it because if a mine/UXO did not go off the first time it will not explode later.

Truth Over time, soil can become compacted (especially through the process of freezing/thawing or flooding); therefore, the sensitivity of a mine/UXO can change, and under such conditions it may require many footfalls to activate a mine.

Myth One way to avoid injury in a dangerous area is to run or drive as fast as possible. If you run or drive very quickly, you can avoid the blast of an exploding mine.

Truth You cannot outrun the fuse of a mine/UXO or the blast wave.

Myth Luckily landmines do not last very long, and after a few years in the ground, they tend to rot and will not work.

Truth Most mines and also UXOs and IEDs remain dangerous for decades. Many cases of these devices are made of plastic and are completely waterproof.

Myth Cutting a tripwire will disarm a mine, booby trap or IED.

Truth Most tripwire-activated ammunitions are detonated by the slightest increase or release of tension in the wire, so there is no



PICTURE 3.6

Curiosity; taking a souvenir or posing for a photograph? If you did not drop it, then do not pick it up!

UN Photo/Thomas Enke

PICTURE 3.7

Artillery round, mortar round and other items of UXO are raw material for building an IED, Afghanistan. UNMAS Photo/Thomas Enke

3.2 Common myths about mines and ERW

certain way to disarm it unless it is done by specialized clearance personnel.

Myth Unexploded ordnance poses less of a threat because you can see them and simply move them out of your way.

Truth You should never approach or touch any ordnance like mines, UXO, ERWs or IEDs. Even if it was moved once, it may explode from a subsequent disturbance. Some ordnance is so volatile that it might explode at the slightest touch.

Myth Burning an area will clear mines, UXO and IEDs.

Truth Just because villagers say they have done it does not make an area safe. It actually may make any remaining ordnance more volatile.

Myth Abandoned ordnance is quite safe as they have not been primed for use.

Truth Abandoned ordnance is often left in environmental conditions which make them extremely unstable. Exposure to heat can make a device extremely volatile and liable to explode, or careless handling can detonate even packaged ammunition.

Myth Livestock in a field makes the field safe from mines or submunitions.

Truth Although sometimes practised by villagers to clear mines or submunitions, this method is not safe. It may explode some of the ammunition but not necessarily all.

Myth If you know a road has been used safely for at least six months, you can assume there is no longer a mine or submunitions risk.



PICTURE 3.8

A high explosive hand grenade, charred but still dangerous; Balkans. UNMAS
Photo/Thomas Enke



PICTURE 3.9

A 762 mm x 51 Cartridge Case (Blank Ammunition) after about 20 seconds in a bonfire. Note the sharp edges. Photo/German Forces

3.3 Safety advice for organizations

Truth Mines and submunitions may become unearthed from constant use of the travelled surface. The travelled area of a road may become unusable in the rainy season, forcing drivers to use the shoulders of the road where mines may be buried.

Myth Mines are always laid in a predictable pattern to create a regular barrier.

Truth While conventional armies often do lay regular, patterned minefields, many mined areas have no discernible patterns and it can be impossible to predict where a dangerous area starts or stops, particularly in countries that have experienced civil conflict and where no clear battle lines existed.

3.3 Safety advice for organizations

It is important for organizations operating in heavily mine-, ERW- and IED-affected areas to take the threat of these hazards seriously when planning and implementing projects that may expose staff to risks; including the staff of local implementing partners. This entails the establishment of and accessibility to effective safety procedures, appropriate training, appropriate equipment and up-to-date information. Avoiding just one accident through safety training and planning will make the investment well worth it.

Safety measures should be seen as an extension of existing security procedures for operating in a conflict area, even if the conflict may have ended some time ago. These measures should be practical and based on an assessment of the extent and nature of the local threat, and could include:



PICTURE 3.10
Gunpowder reacts to friction. So it will be very dangerous to scrape aside these cartridges and step into the area; Afghanistan. UNMAS Photo/Thomas Enke

PICTURE 3.11
This cluster munition BLU-755 did not go off but is still dangerous; Balkans. UNMAS Photo/Thomas Enke

3.3 Safety advice for organizations

- Collecting detailed information on the mine/ERW/IED threat in your area of operations, and updating this information regularly. Consider keeping a visual brief available (a map or spreadsheet identifying dangerous areas);
- Establishing mine/ERW/IED safety procedures in accordance with the information contained in this handbook and adapted to your area of operations. In particular, establish a vehicle and travel reporting system (see Annex 1 on the use of route cards);
- Maintaining updated and verified contact details of mine action centres and agencies, United Nations security officers, Multinational EOD Coordination Cell (MN EOD CC) and National Point of Contact EOD (NPOC EOD) of Peacekeeping-, Observing- or Training-Mission Contingents, local police and medical facilities.
- Request for information held in the database “Information Management System for Mine Action (IMSMA)” from the National Mine Action Centre.
- Providing mine/ERW/IED-related information to your staff in a convenient format, including information on safe routes and dangerous areas in your areas of operation, as well as emergency contact information.
- Ensuring that all your staff, who may be at risk (including drivers, interpreters and guides), receive mine/ERW/IED-awareness training and are familiar with mine/ERW/IED safety procedures.
- Understanding that levels of alertness to the mine/ERW/IED threat will decrease over time; and safety refresher training may be required.

Make sure you know who to contact for help in case of a mine/ERW emergency.

3.4 Safety advice for individuals

3.4.1 GENERAL SAFETY MESSAGES

- Ensuring that your staff receives first aid training, with special focus on trauma care, and that vehicles are equipped with first aid and trauma care kits.
- Equipping your vehicles and staff with effective communication equipment and maps, and providing training in their use.

In areas of high risk and high exposure, consider modifying vehicles to provide additional protection from an explosion. See Annex 2 on general measures to provide additional protection to a vehicle.

3.4 Safety advice for individuals

Being informed, exercising common sense, and maintaining a proper attitude about mines, ERW, UXOs and IEDs can go a long way to help address the safety issues and keep people safe. Some pointers for personal protection and for the protection of your colleagues follow.

3.4.1 GENERAL SAFETY MESSAGES:

- Do not touch or approach mines, ERW, UXOs or IEDs;
- Prior to travel, obtain information on dangerous areas;
- Never venture into known dangerous areas, explore military installations or equipment;
- Never approach or touch mines, unexploded or abandoned ordnance, IEDs or other suspicious objects for any reason;
- Never collect mines, ERW, UXO, IEDs or other military hardware;



PICTURE 3.12
Conventional Munitions Disposal Training, South Sudan. UN Photo

PICTURE 3.13
Don't go to abandoned military installations, booby traps, mines, IED and unsafe ERW; this should not be underestimated; Afghanistan. UNMAS Photo/Thomas Enke

3.4 Safety advice for individuals

3.4.2 BE PREPARED

- Do not touch anything that appears strange or out of place lying on the ground or hanging from a tree;
- Be aware of local warning signs and always respect them;
- Always be alert for other clues of possible danger;
- Provide important safety information to others;
- Keep others informed about your travel plans.

3.4.2 BE PREPARED

3.4.2.1 EO/IED-Awareness Safety and First Aid Training

Ensure that you have received mine/ERW/IED Awareness and First Aid Training, and are familiar with your organization's safety procedures. If you haven't been offered such training, ask for it.

3.4.2.1 Contact information

Keep contact details of mine action centres and agencies, United Nations security officers, Multinational EOD Coordination Cell (MN EOD CC) and National Point of Contact EOD (NPOC EOD) of Peacekeeping-, Observing- or Training-Mission Contingents, emergency services and medical facilities on hand. Verify and update emergency contacts on a regular basis.

3.4.2.2 First aid kit

Ensure that a travel pack with a first aid kit is in your vehicle at all times. Check expiry dates and serviceability of all items, and know how to use them.

**Don't touch!
Record and
report.
Do not collect
war souvenirs!
Never remove
mine warning
signs for any
reason!**

**Stay away
from
abandoned
military
equipment!**

3.4 Safety advice for individuals

3.4.3 ASSESS THE LOCAL THREAT

3.4.2.3 Communication

Do not travel without a radio or telephone, and know how to use it. Be informed of all the alternative frequencies or telephone numbers that you may require (e.g. mine action agencies, United Nations security officers, Tactical Operations Centre of Peacekeeping-, Observing- or Training-Mission Contingents).

3.4.2.4 Dangerous area maps

Different demining organizations, the Geneva International Centre for Humanitarian Demining or the MN EOD CC, NPOC EOD of Peacekeeping-, Observing- or Training-Mission Contingents, can provide maps with information of minefields/ERW and other dangerous areas. If available, carry a map marked with the best available information about routes known to be free of mines, ERW or other hazards like an IED threat. Update this information by checking with local populations as you travel, and heed their warnings.

3.4.3 ASSESS THE LOCAL THREAT

Obtain detailed information on the mine/ERW/IED situation prior to any movement into an area that may contain mines or ERW or a threat of IED attacks. You will also need to be aware of official and unofficial warning signs in your area. When available, contact the following for information:

- Local Mine Action Centres (MAC) and mine action agencies;
- United Nations Security Officers;

Did you know?

Although locals are usually one of the best resources to assess the mine/ERW threat, many accidents happen because local people develop a different sense of risk. Walking and driving through their regions every day without any incident may create a false impression of the actual situation.

Aid workers or foreign journalists often rely on their local counterparts such as drivers, interpreters or stringers, when it comes to assess the safety of an area. Aid workers and journalists normally do not question these assessments, because "everything feels right" or because they don't want to come across as overtly cautious or "fussy."

3.4 Safety advice for individuals

3.4.3 ASSESS THE LOCAL THREAT

- United Nations Military Observers or Liaison Officers;
- Non-governmental organizations and aid agencies working in the area;
- MN EOD CC, NPOC EO of Peacekeeping-, Observing- or Training-Mission Contingents and/or
- Local authorities.

Also ask the local population for additional information, being sure to consult with men and women, even children, who will have different knowledge about the local threat because of their differing daily activities. Keep in mind, however, that returning populations may not be aware of the local threat. If you are travelling in a high-risk area, ask the civilian and military organizations and locals some of the following questions to compile information about the threat:

- Have there been mine or UXO accidents in this area involving people, animals or vehicles? What caused the accident (mine, UXO or booby trap/IED)? Where and when did it take place?
- Where do you suspect or know there are mines or UXO?
- Has there been any fighting in this area? Where?
- Have there been any soldiers living/working/passing through this area?
- Have there been explosions in the area? Where?
- Are there roads, tracks, crossings, fields, wells or houses you do not use because of safety concerns?
- Where are the safe roads?
- Are there new or old military camps in the area you should avoid? Where?
- Do you mark dangerous areas, or are there official markers?
- What do they look like?

(CONT)

Remember: In mine-affected areas, you are better to be overly cautious a hundred times than wrong just one time. Get your mine safety briefing, and make sure your local counterparts have had theirs too!



PICTURE 3.14

Bridges are strategic and also vulnerable points. Beware of mines, UXOs and IEDs; Balkans. UNMAS
Photo/Thomas Enke

3.4 Safety advice for individuals

3.4.4 EXERCISE COMMON SENSE

The local population often does not differentiate between mines or other ordnance. They may simply refer to bombs in general or to mines in general. Determining the type to which they refer may make a significant difference to your travel plans; mine- or submunition-contaminated areas often pose a greater hazard to travelling than unexploded ordnance. However, if in doubt, assume the worst and avoid the area. Even if only one source indicates an area is dangerous, avoid it!

If you obtain new information regarding the local threat of mines or ERW, provide it to your head office, the local MAC, mine action agencies, United Nations Security Officers or the MN EOD CC, NPOC EOD of Peacekeeping-, Observing- or Training-Mission Contingents so that they can share it with other organizations and staff members.

And don't forget to inform others of your travel plans, whether your trip is private or professional.

3.4.4 EXERCISE COMMON SENSE

- Do not enter areas known or suspected to be contaminated, and use only cleared and approved routes.
- Don't touch or approach mines, unexploded or abandoned ordnance or IEDs. Do not approach military installations or equipment.
- Do not approach UXO or abandoned ordnance, abandoned guns or items that appear out of place, as they may have been booby-trapped. In conflict situations, it is often better to assume that all abandoned military vehicles and installations, UXO and abandoned ordnance are booby-

Mine Action Centres

In many countries severely affected by mines and UXO, governments, United Nations agencies and non-governmental organizations have helped establish Mine Action Centres. These centres act as the focal point for the coordination of efforts to clear ordnance, mark dangerous areas, provide risk education and undertake advocacy for survivors of accidents.

These centres are normally run by the civilian arm of government, and support humanitarian and development operations. They are often separate from military efforts to clear ordnance, or security forces and police that deal with improvised explosive devices.

3.4 Safety advice for individuals

3.4.4 EXERCISE COMMON SENSE

trapped. Specialists are required to check thoroughly for the presence of booby traps and improvised explosive devices. Beware of anything with unusual wires leading to it or coming from it. Also abandoned weapons can be loaded and be in an unstable or unknown condition.

- Do not pick up any item of interest, unless you have dropped it yourself.
- Know who to report to and what to report. Mine action centres and mine action organizations will usually deal with landmine and ERW threats that pose a humanitarian threat or impediment to development, while the military and police normally deal with abandoned ordnance and improvised explosive devices that pose a security threat.
- Take extreme caution near known or suspected minefields, ERW- or IED-contaminated areas, whether they are marked or not. During surveys of mined areas, smaller hazard areas may have been overlooked. Mines or ordnance may also have moved due to rains and erosion. If you are around an area being cleared of mines or ERW, do not approach the mine clearance teams, unless you are invited by them to do so, and then follow their instructions at all times.
- Radio or cellular phone transmissions emit radio waves that could initiate electric detonators of radio-controlled devices, or certain types of unexploded ordnance. Avoid making radio or cellular phone transmissions around UXO, booby traps or IEDs in a distance closer than 50 metres.
- If you are undertaking construction activities, digging wells, or building roads or canals in areas that have been the subject of large-scale bombing or protracted land battles, be aware that you may uncover landmines and unexploded ordnance. If so, stop digging immediately, clear the worksite

3.4 Safety advice for individuals

3.4.4 EXERCISE COMMON SENSE

of all people and inform local authorities. Do not attempt to move unexploded ordnance or mines.

- If you plan to establish an office or house in a conflict or post-conflict environment, check that the immediate area does not have weapons or ammunition depots, abandoned or otherwise. Close proximity to a weapons or ammunition depot always poses a risk and if actively used, may be subject to attack.

3.4.4.1 Travelling in a vehicle

- Inform your office of the dates, times and planned route of your journey, by filling out a route card. (An example of a route card is given in Annex 1, together with a description of its use.) If you change your route, inform your office. If you cannot communicate, it is better not to deviate. Be aware that if you fail to arrive at your destination at the specified time or to report in, your organization will come looking for you.
- Whenever possible, travel with a companion, preferably one who knows the area and the route you need to use if you do not. Travelling in two vehicles in most instances is better.
- Drive carefully with discipline and in the ordered sequence. Depending on the IED threat and the use of electronic counter measures, keep the ordered distance between the cars and be attentive to stop immediately.
- When starting a journey in the morning, allow sufficient time for local traffic to have subsided before undertaking your travel. Stick to well-travelled routes, and stay in the travelled zone of the road. Plan your trip well, avoid using dangerous roads after heavy rains and throughout the rainy season:

Use common sense. When in doubt stay out! Before driving in conflict areas check with local authorities about AV mines. Never drive on road verges! Stay in well-worn tracks. Stay on well-used roads or paths and on the tarmac whenever possible. Beware of obstacles in the road or on the path.

3.4 Safety advice for individuals

3.4.4 EXERCISE COMMON SENSE

deep flooded potholes may tempt you to leave the “safe” zone. Mines may be moved or exposed by rain.

- Do not travel at night. Plan your journey to end two hours before sunset. This will allow you and your headquarters at least two hours of sunlight to react to an emergency. In addition, mine warning signs and clues cannot be seen at night.
- Wherever possible, stay on paved roads, even if it means the trip will be longer. Paved roads are generally less likely to be mined than unpaved roads. However, potholes and the shoulders (or verges) of paved roads offer opportunities to conceal mines — avoid potholes and avoid driving off paved areas. Do not leave the main road or track to turn your car. If you have a flat tire or your car breaks down, don't pull over to the side, but rather fix it on an area that has obviously been used or is paved.
- On dirt roads, stay on well-travelled tracks. The tracks have to be wide enough for your vehicle. The wheels of a truck, for example, are much wider than those on a four-wheel-drive vehicle. They may extend outside existing tracks.
- Beware of obstacles in the road or on a path. An obstacle in the road could be a diversion designed to make you step or drive off the road and into a minefield. Never leave the road to allow a vehicle to pass, to overtake, pass an obstruction, or turn around. If necessary, reverse back until a safe area is available. Beware of pulling off the road into lay-bys as they may be mined.
- Define angles and areas of surveillance between the passengers in the cars.
- Look for markers and ground signs. Uncommon clothes in the trees, a couple of stone could be hints for an IED attack.
- Take special attention at vulnerable points like bridges,



PICTURE 3.15

(First two images) Stay in the travelled zone. Be prepared to reverse; Balkans. UNMAS Photo/Thomas Enke

PICTURE 3.16

NEVER drive onto the shoulders or verges. The drivers of the cars are taking an unnecessary risk. UNMAS Photo/Thomas Enke

3.4 Safety advice for individuals

3.4.4 EXERCISE COMMON SENSE

junctions, choke points and slowdown points. These points are very attractive for IED attacks. Never drive around roadblocks of former military positions. Never drive over any object on the road. A paper bag, a piece of cloth, or a wooden board can all conceal mines or booby traps or IEDs. Drive with care, at low speeds.

- Do not leave the road for any reason, even to relieve yourself. Stop in the travelled zone and step behind your car.
- Avoid routes or areas that have been subject to attacks using improvised devices, and avoid such areas because it is impossible to predict when such an attack may next take place.
- A well-used road by day may not be safe by night if warring factions are active in the area. Care should be taken when approaching cities or villages at dawn or dusk as mines are sometimes laid for protection during dark hours. Simply follow the rule to allow traffic to precede you in the morning, and not to travel after dark in a mine-affected area.
- Wear seatbelts at all times. The blast of a mine or an IED may propel the passengers into the roof of the vehicle causing severe head or neck injuries, or it may overturn a vehicle throwing passengers around the cabin, sometimes leading to otherwise preventable death or injury.
- Before you stop, look for shafts and holes, or traces of digging on the ground. Do not park your vehicle on this. On every halt (planned or unplanned) conduct a 5/25 m check as shown in the annex A3.
- Ensure that your drivers have received mine safety driver training.

3.4.4.2 Traveling on foot

- Allow a local guide to lead the way. Allow a distance of at



PICTURE 3.17
Abandoned ordnance near the road, looks strange; Afghanistan.
UNMAS Photo/Thomas Enke

PICTURE 3.18
UXO: A 20 mm high explosive anti-aircraft projectile that looks like a stone; Afghanistan.
UNMAS Photo/Thomas Enke

3.4 Safety advice for individuals

3.4.4 EXERCISE COMMON SENSE

least five metres, but ideally 25 metres between members of the group.

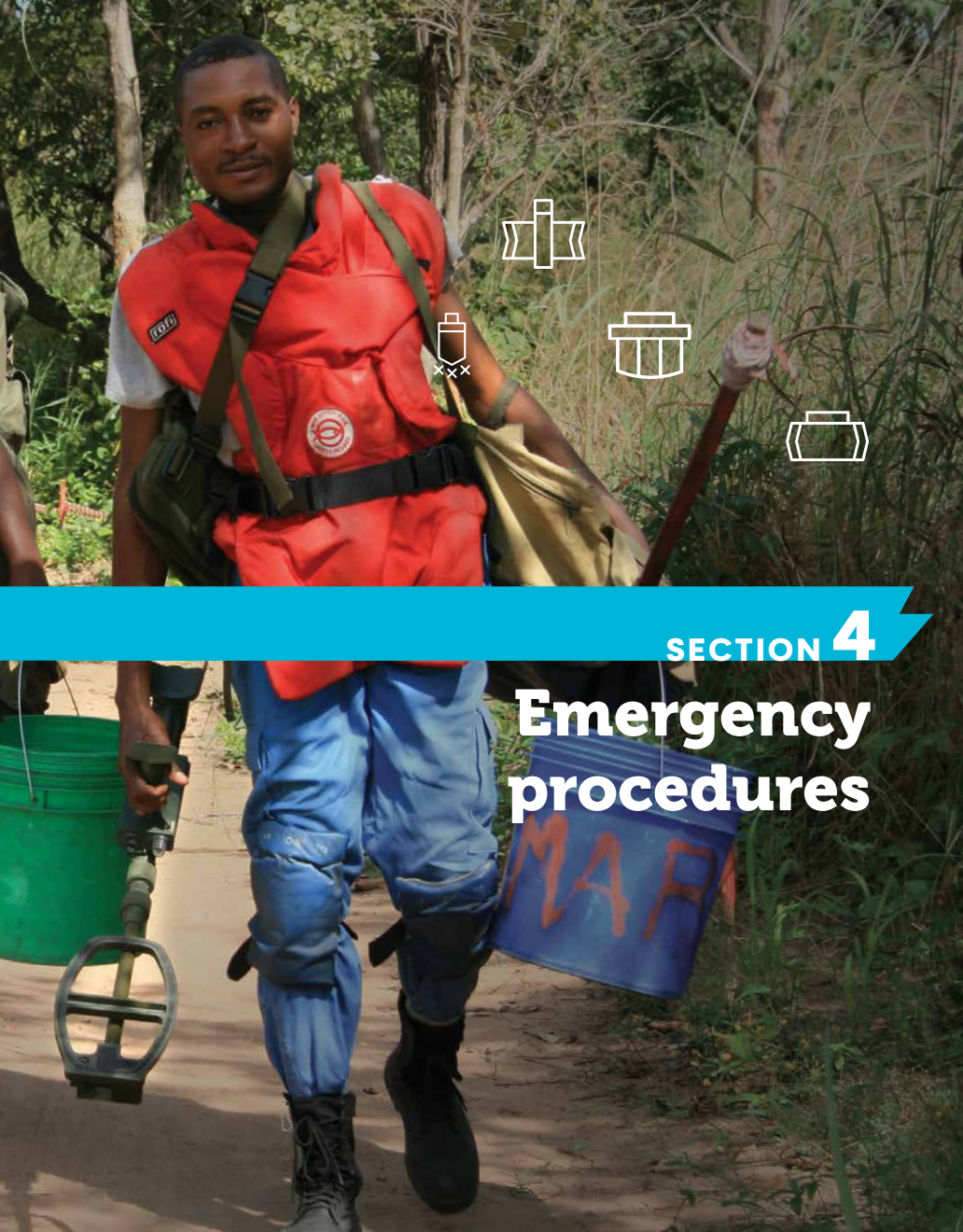
- Never walk through overgrown areas. Instead, stick to paved sidewalks and well-used paths.
- Carry communication equipment and a first aid kit at all times. Do not leave them in your vehicle. These items should be carried by a person walking in the middle of the team or towards the back, and not by the lead person.
- Do not move obstacles as they may be mined or booby-trapped.
- Do not enter abandoned buildings, walk under bridges or visit deserted locations. Talk to the local population and observe local behaviour to find out about safe areas in communities.
- Refuse offers to be shown a mine, UXO or IED.
- Do not touch unknown or unfamiliar objects in mine/ERW/IED-contaminated areas. Do not collect war souvenirs, and do not approach abandoned military vehicles or facilities.
- Define angles and areas of surveillance between the members of the group.
- Look for markers and ground signs. Uncommon clothes in the trees, a couple of stones could be hints for an IED attack.
- Take special attention at vulnerable points like bridges, junctions, choke points and slowdown points. These points are very attractive for IED attacks.
- Don't step over shafts and holes or traces of digging on the ground.
- Follow these rules on work and private trips in known or suspected hazardous areas. Always ensure that you inform someone of your travel plans.
- Above all, stay alert.



PICTURE 3.19
Road in Afghanistan with red and white marking stones. Stay on the white side! UNMAS
Photo/Thomas Enke

Democratic Republic of the Congo
UNMAS Photo/Marc Vailant





SECTION 4

Emergency procedures



Emergency procedures

4.1 Emergency procedures in an explosive contaminated area or in a minefield

When in areas of unexploded and abandoned ordnance, “not approaching” and “never touching” are the basic safety principles that should keep you safe. If you see a UXO or you approach an area littered with ordnance, this does not necessarily mean that you are in a minefield. Specialists will usually refer to such an area as a battlefield. In such areas, UXOs like bomblets or other submunitions can be found on the ground, in the trees or anywhere else. These areas are not less dangerous than a minefield and most of the upcoming instructions are the same. The best policy is to avoid these areas, but report your observations to ensure the Mine Action Centre (MAC) or other appropriate authorities as described before are aware of the specific threat.

If you spot a mine/UXO/IED warning clue however (for example, an exposed mine/UXO or a hole where a mine/UXO has exploded), you should assume you are in a dangerous area, unless certain you are on a safe road or path. Once in an area like this, there is very little a non-specialist can do and the skills required to deal with the devices and situations of a minefield cannot be taught or learned on a casual basis.

This section provides some general emergency procedures should you ever find yourself in an EO contaminated Area or in a minefield.



PICTURE 4.1
An ERW covered with roots and leaves is not easy to find; Balkans.
UNMAS Photo/Thomas Enke

4.1.1 EMERGENCY PROCEDURES ON FOOT

The two most likely ways you will discover that you are in a mined area are either that there is an explosion, or that you see a mine or mine sign. If someone has been injured, you should not rush in to help, as you will endanger yourself and others around you. If you find yourself in a minefield, stay calm and follow these rules.

- M** Movement stops immediately. Stop! Remain still and do not move your feet.
- I** Inform and warn the people around you. Call for help, but keep others away.
- N** Note the area. What else can you see: mines, tripwires, mine signs? Visually locate the nearest safe area: the last place you knew you were on a safe surface, such as a paved road, well used path, concrete or steel structure.
- E** Evaluate your course of action. Be prepared to take control.
- D** Do not move, if there is no indication of a safe area, or you can't reach it without stepping on unknown ground. Wait for help to arrive.

While waiting for help may seem an inadequate response, if you have followed proper safety procedures regarding travel, it will only be a matter of time before qualified personnel come to assist you. The alternative may be death or serious injury.

Be careful of non-specialists offering to help. They may be unaware of the full extent of the danger, or overconfident in the limited knowledge they may have. People will sometimes take unacceptable risks to rescue an injured person.

4.1

Emergency procedures in an explosive area or minefield

4.1.1 EMERGENCY PROCEDURES ON FOOT

4.1.1.1 Mark and report

If you come across a mine or UXO, you should report the location to the MAC and other appropriate authorities (village leaders, police, army personnel, or the nearest mine clearance organization) as described above.

Some programmes advise people to mark a mined area to warn others of the danger. In some cases marking may be dangerous, since you must find and place a suitable marker, and therefore remain in the area of the mine and perhaps of other mines. Moreover, it may not be clear to others where the mine is in relation to the marker.

Some key points about marking to remember include:

PICTURE 4.2

Marking a dangerous area should be done with care and safety; Balkans. UNMAS
Photo/Thomas Enke



4.1

Emergency procedures in an explosive area or minefield

4.1.1 EMERGENCY PROCEDURES ON FOOT

- Never leave the safe path to make or place a warning sign;
- The sign you make must be visible and recognizable to adults and children. You will need to know the marking that is commonly used in the area;
- The sign should be placed in a safe area, not on mined ground;
- Never mark individual mines, but give a clear indication that danger is present and
- Check with your organization regarding its marking.

4.1.1.2 Retrace footsteps

Retracing footsteps is a procedure for exiting a mined area by walking back the way you entered, exactly in your footprints. To retrace footsteps is not a safe option for getting out of a minefield, as it is highly unlikely that the true outline of your footprint will be visible unless you are walking in mud or snow. Even when you can see some outline of prints, the procedure is extremely dangerous as you may trip, fall, or place your feet incorrectly. Also beware that there could be a low-tension trip wire, that was not seen on the way into the terrain, which could be touched and lead to igniting a mine.

In some countries, waiting for help may not be practical or safe. If you want to learn the method of retracing your footsteps to get out of a minefield, specialists from a MAC or specialist organization must be consulted, and proper procedures learned through practical exercises.



PICTURE 4.3

Never leave the safe path; Balkans. UNMAS Photo/Thomas Enke

4.1.1.3 Prodding

Prodding is another method to exit a mined area, by locating safe ground on which to walk to a safe area. By prodding the ground with a knife or other similar object, locate ground free of mines. Prodding is an extremely difficult, prolonged and risky technique, taught to professional deminers, and requires substantial practice. Prodding must be taken very seriously and carefully. It demands a very thorough knowledge of mine detection methods and mine types, and appropriate equipment. Prodding should only be considered if you have received professional and certified training and no other above-mentioned option is available, for example:

- If you are in a mined area and no help is available;
- If you are in a mined area and under direct attack;
- If an individual has been injured and cannot get out of a minefield and no other help is available.

Such situations are extremely unlikely. Check with your organization's policies on prodding!

4.1.2 EMERGENCY PROCEDURES IN A VEHICLE

If you have any reason to believe that you have driven into a mined area such as another vehicle detonating a mine, by seeing a mine or mine signs, or if your vehicle has hit a landmine, the following steps should be observed:

Always have your emergency contact list up to date!

Know how to report an emergency: What, where, when? How many victims?

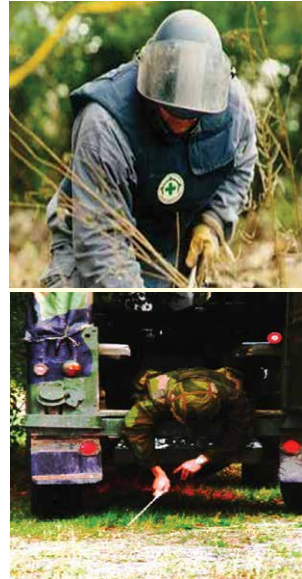
4.1

Emergency procedures in an explosive area or minefield

4.1.2 EMERGENCY PROCEDURES IN A VEHICLE

- M** Movement stops immediately. Stop the vehicle! Do not attempt to reverse out of the area, and do not move the steering wheel. Be calm and, if possible, stay in the vehicle.
- I** Inform and warn people around you. Call for help, but keep others away. Use the car horn to summon help.
- N** Take note the area. What else can you see: mines, tripwires, mine signs? Visually locate the nearest safe area: the last place you knew you were on a safe surface, such as a paved road, well used path.
- E** Evaluate your course of action. Be prepared to take control.
- D** Do not move, if there is no indication of a safe area, or you can't reach it without stepping on unknown ground. Wait for help to arrive.

- When a vehicle strikes a mine or ERW, the first instinct of survivors may be to rush out of the vehicle. However, unless the vehicle is on fire or has ended up in a life-threatening position, stay in the vehicle. It is very likely that there will be more mines, including anti personnel mines, or other ERW in the area. If you can, give first aid assistance to other passengers in the vehicle who require it. Stay calm.
- If the procedures regarding route cards have been followed, it will only be a matter of time before qualified personnel come to assist you. Even if you are in areas outside of radio contact and you are unable to keep to the agreed schedule for radio checks, due to injury or damage to the equipment, an evacuation team should be on its way to assist you, if you have the proper emergency procedures in place.
- In situations where you must leave the vehicle (if your vehicle is on fire, for example), do not touch the ground until



PICTURE 4.4

Prodding is a very dangerous procedure, good skills and experience is needed; Balkans. Photo/German Forces

PICTURE 4.5

Leave the vehicle only in a case of emergency; seen on a training in Germany. Photo/German Forces

4.2 Emergency procedures in case of an IED attack

you are in your wheel tracks facing back the way you came. Walk in the tracks of the vehicle until you reach safe ground. If there are other people in the vehicle, leave the vehicle one at a time allowing at least five metres between each person.

- Be aware of tripwires. Tires should push the wire to the ground so that a mine will not be ignited. By stepping back the wire could be thrown.
- Get mine clearance experts to retrieve the vehicle from the minefield. Otherwise, leave it.
- Once out of the mined area, make sure that you report the incident to the proper authorities.

4.1.2.1 Reversing in your tracks

Reversing in your tracks is a procedure to get a vehicle out of a mined area by reversing it exactly over tracks made when you entered the area. This method is extremely risky if you are unable to steer the vehicle precisely or if the tracks are not clear; it may not be possible if other vehicles or obstacles are in the way or if you have a flat tire.

4.2 Emergency procedures in case of an IED attack

IED attacks can take place everywhere, but sometime there are some hints as written above. If you find an IED on your trip, if you are at a vulnerable point or you are involved in an attack, it will be important to react calmly and safely.



PICTURE 4.6

An IED with about 25 kg of HME is a large enough charge to throw an armoured vehicle to the side; Afghanistan.

UNMAS Photo/Thomas Enke

4.2.1 IED-FIND

IEDs could be victim- or command-operated. A victim operated IED leads to the same procedure as staying in a minefield, because the IED could be ignited by a tripwire, a pressure-plate or an AP mine. Command-operated IEDs need a line of sight and an additional marker. If possible, do not walk in the area of the line of sight and cover yourself. In both cases the following steps, the 5C's, have to be followed:

- **Confirm:** Do not touch, make a mental note (digital camera), mark (if possible) and withdraw the way you stepped in. Be aware of tripwire, pressure plates and AP mines.
- **Clear the area:** Use the evacuation distance guide (annex A5.1) or at minimum a distance of 300 metres.
- **Call appropriate authorities** (village leaders, police, army personnel, or the nearest mine clearance organization). Use the Nine-Liner report format for passing information (annex A5.2).
- **Cordon:** Prevent vehicle- and foot-traffic from approaching the IED.
- **Control:** Control the site until appropriate authorities arrive on the spot.

It is important to secure yourself. Watch the behaviour of the local population and be aware of secondary IEDs as well as IEDs in a daisy chain¹³.

¹³ A special kind of IED contains a couple of main charges in a row (could be spread out over hundreds of meters), triggered with one switch.

Command activated

A process where a second person detonates an improvised explosive device by remote control. This person is called a triggerman.

Victim activated

Triggered by a person when it is stepped on or driven over the IED.

4.2.2 IED EXPLOSION

In case of an unknown or IED explosion, it is mandatory to secure yourself. Secondary IEDs as well as hazards from the exploded device (e.g. burning cars, destroyed power lines) are important threats. Secure yourself with a 5/25 m check (as explained in annex A3) to have a safe surrounding. After this, again follow the 5 C's:

- Confirm: Clarify the situation from a safe point.
- Clear the area: Use the evacuation distance guide (annex A4.1) or at minimum a distance of 300 metres.
- Call appropriate authorities (village leaders, police, army personnel, or the nearest mine clearance organization). Use the Nine-Liner report format for passing information (annex A5.2).



PICTURE 4.7

The remaining parts of a VBIED; Afghanistan. UNMAS
Photo/Thomas Enke

4.2 Emergency procedures in case of an IED attack

4.2.2 IED EXPLOSION

- Cordon: Prevent vehicle- and foot-traffic from approaching the IED.
- Control: Control the site until appropriate authorities and rescue teams arrive on the spot.

Do not run to the site of the explosion. Do not touch any thrown part of the IED components or of the target. Inform the appropriate authorities of your find.



Lebanon

UNMAS Photo/Marc Vaillant



SECTION 5

**Assisting
a victim**

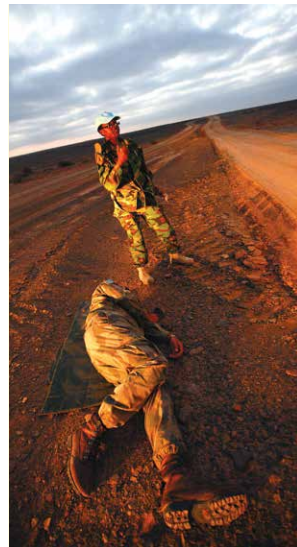


Assisting a victim

In the event that you witness an accident as described above, you may be required to give assistance from a safe area. This section provides an overview of some of the basic actions to take if you witness an accident and if no assistance is available. This section is not a substitute for emergency first aid training or for utilizing trained medical and mine clearance specialists.

In case of an accident, you are advised to do the following:

- Stay calm!
- Do not rush to the victim.
- Do not try to rescue her/him in what may be a minefield or other unsecure area.
- Talk to the victim; warn them not to move; advise how to self-administer first aid; advise that help is on its way.
- Note time and location and the number of injured.
- Call for help. Arrange for both clearance assistance and medical evacuation. Use the Nine-Liner (annex A5.2).
- Prepare the first aid kit.
- Wait for assistance to arrive.



PICTURE 5.1
Call for help, MINURSO
Officers Perform Training
Exercises in Smara, Note
the recovery position;
Territory of Western
Sahara. UN Photo

5.1 Evacuation from a spot of an unknown explosion

When an accident with an explosion takes place, the victim is in an unsecure area.

In such cases, the rescue options are extremely limited. The victim will need to be evacuated from the area by a mine clearance- or EOD-team before receiving medical assistance. In calling for help, you will need to arrange for mine clearance or EOD and First Aid, so be sure to have a comprehensive emergency contact list (radio frequencies, call signs, phone numbers, etc.) and the Nine-Liner (annex A5.2) available.

If the victim is in a minefield or in an UXO contaminated area, and help is not available from a mine clearance team to get the victim out of a mined area, prodding has been used as a method to evacuate victims (see section 4).

In the case of an IED explosion the threat of a second IED or another kind of attack (such as a sniper attack) is very high. Therefore observe the surrounding area very carefully (line of sight). Check the path to the site of the explosion using the 5/25 m check (see annex A3) to create a secured path for withdrawing. Use cover from the sight of possible attackers and additional explosions. Check the site very carefully before starting to take care of the victim.

5.2 Administering first aid

If the accident took place in a lead vehicle and you are in another vehicle travelling behind, you may be able to reach the casualty by walking in the vehicle's tracks. However, the blast from an anti-vehicle mine or an IED will most likely have overturned the lead vehicle and moved it away from the tracks. In such cases, the surrounding area should be considered mined and not entered.

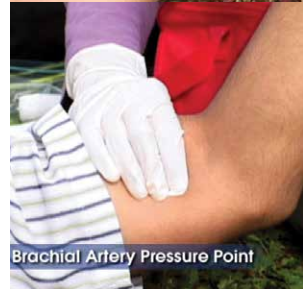
5.2. Administering first aid

Once the victim is brought to safe ground, and if there are no medical personnel immediately available, you should administer emergency first aid to the best of your ability and training, until medical help arrives.

Follow the CAB rule and assess the likelihood of spinal injury, and fix the head if possible¹⁴:

C irculation	Stop the bleeding
A irway	Prevent airway blockage
B reathing	Support the breathing

Look for bleeding. Identify and stop the bleeding. The most common and preventable cause of death is by bleeding to death. Use direct pressure rather than indirect pressure for bleeding control, consider haemostatic agents and use a tourniquet if necessary. Bleeding of the extremities can be stopped very quickly and effectively with tourniquets as a temporary measure for gaining time. Additionally, if possible, an analgesic should be



PICTURE 5.2

It is important to stop the bleeding. UN Photo



PICTURE 5.3

Head tilt/chin lift. UN Photo

¹⁴ The following hints are excerpts of the script of the ETB-Training inside the UN, issued from the Department of Safety and Security.

5.2 Administering first aid

administered, because the pain caused by the tourniquet can be more than the pain from the injuries. It is mandatory to mark the use of the tourniquet and time it was applied, with a short notice on the forehead of the injured person, with a waterproof pencil. A tourniquet can be used for a timeline of 6 hours, and in individual cases up to 16 hours. Up to this time the opening of tourniquets is only allowed with additional medical treatment!¹⁵

If no tourniquets are available, remove clothing to expose the wound. Press at the artery, at the groin for feet and leg injuries, or in the armpit for injuries to the hands or arms. Use whatever bandages or material available to make pressure dressings for the wounds, and pack cloth deep inside the wound. If bleeding continues through the dressings, apply more material and apply firm manual pressure on the artery.

Check the airway for foreign body obstruction. If the victim is unconscious open the airway with head tilt/chin lift. For mass casualty situations, when you need to tend to many victims quickly, insert an OPA (Guedel airway) where possible (e.g. if the patient has no gag reflex).

Look, listen and feel for breathing, if unconscious. Do so for no longer than for 10 seconds. Briefly assess the rate, depth and sounds. Check whether both sides of the chest move equally.

Assess the victim for responsiveness. There are four different levels:

- Alert and orientated: the victim give clear information to person, place, time and event;

¹⁵ Neitzel, Ladehof: Taktische Medizin, Springer 2012

5.2 Administering first aid

- Verbal: the victim responds to verbal commands (“open your eyes”, “move a finger”);
- Pain: the victim responds to earlobe pinch, sternum rub.
- Unresponsiveness: the victim does not respond to verbal or pain stimuli.

Reassess the likelihood of spinal injury. Ask the victim, “Where does it hurt, can you move your hands and feet?”. If possible apply a cervical collar after checking neck.

People with a low body temperature are prone to bleed more. Protect the casualty from wind, rain and cold. Keep them calm and warm, but do not expose them to bright sunlight. Cover the victim with an emergency blanket if they are cold or in shock. Position the victim as appropriate, make comfortable and loosen clothing. Talk to them and explain what you are doing, and that help is on the way.

After a secondary survey, control the vitals in a periodical time frame.

Let the person drink small sips of warm water or other non-alcoholic fluids to avoid hypothermia, but only if she is able to talk, meaning there is no obstruction to the airway.

Once you get the patient to a vehicle, transport him/her at once to the nearest appropriate medical facility. Use the best transport immediately available, and leave instructions for any remaining better (faster) transport to follow you when it arrives.

5.2 Administering first aid

During transport check the victim's vitals in a periodical time frame and ensure that bandages are properly applied to all serious wounds. Manual pressure on the dressings may have to be maintained during the journey to prevent bleeding.

Libya

UNMAS Photo/Giovanni Diffidenti



Democratic Republic of the Congo
UNMAS Photo





Annexes



Annexes

Annex A1 Use of route cards

A1.1 A MECHANISM TO MONITOR STAFF MOVEMENTS

The strict use of route cards works is an effective mechanism for monitoring the movements of staff, and assists in facilitating prompt and appropriate action should they fail to reach their destination or meet a deadline. An example of a route card is given below.

Route cards should be completed by all personnel travelling in potentially dangerous regions, and handed over to staff with designated responsibility.

The designated person receiving the route card should sign it to acknowledge receipt. She or he should place it in a prominent place, a notice board on the wall, where it can be checked daily.

The designated person receiving the card should be responsible for checking whether or not the staff travelling has returned or not, by the given Estimated Time of Arrival (ETA), and if not, should report the non-arrival of staff to responsible senior staff.

The person making the journey must report back when they arrive and, if delayed, every attempt must be made to report back the cause for the delay and the new ETA.



PICTURE A1.1
Road clearance;
South Sudan. UN Photo


A1 Use of route cards

A1.2 ROUTE CARD

After completion of the journey, the route card should be signed by the designated person, and the card is removed from the notice board and filed.

Information in completed route cards indicating mine and explosive remnants of war-contaminated areas should be forwarded to the local Mine Action Centre or other relevant authorities.

A1.2 ROUTE CARD

A1.2 – Route Card				MISSION SECURITY CLEARANCE REQUEST - UNITED NATIONS			
				Should be sent to the Area Security Coordinator, Area Field Security Officer and Designated Official by the Team Leader at least 24 hours in advance			
Mission Details-Section A							
Number of vehicles				Team Leader's Name			
Purpose of visit				Agency			
Itinerary-Section B							
	City	Date	Hour		City	Date	Hour
1. DEP:				3. DEP:			
ARR:				ARR:			
2. DEP:				4. DEP:			
ARR:				ARR:			
Vehicle Details 1-Section C							
Plate No.	Agency	HF Call Sign	HF Frequency	Self-Call No. (for HF)	Cell/Satellite		
Phone No.							
Name	Agency	Call Sign	Name	Agency	Call Sign		
1			3				
2			4				
Vehicle Details 2-Section D							
Plate No.	Agency	HF Call Sign	HF Frequency	Self-Call No. (for HF)	Cell/Satellite		
Phone No.							
Name	Agency	Call Sign	Name	Agency	Call Sign		
1			3				
2			4				
Vehicle Details 3-Section E							
Plate No.	Agency	HF Call Sign	HF Frequency	Cell Phone No.	Satellite		
Phone No.							
Name	Agency	Call Sign	Name	Agency	Call Sign		
1			3				
2			4				
Vehicle Details 4-Section F							
Plate No.	Agency	HF Call Sign	HF Frequency	Cell Phone No.	Satellite		
Phone No.							
Name	Agency	Call Sign	Name	Agency	Call Sign		
1			3				
2			4				
Vehicle Details 5-Section G							
Plate No.	Agency	HF Call Sign	HF Frequency	Cell Phone No.	Satellite		
Phone No.							
Name	Agency	Call Sign	Name	Agency	Call Sign		
1			3				
2			4				
Recommendation/Approval of the Area Security Coordinator-Section H							
Name	Yes.	Remarks (if any):					
Signature	Agency	No.					
Date:	/ /						
<p>Note: If a vehicle holds more than four (4) passengers, please list each passenger in the next section altering the numbers to 5,6,7 etc. Sheet No.(if more than one sheet is used) ____ of ____.</p>							

A1.3 ROAD MOVEMENT PROCEDURES

The following document is an excerpt only; it is not specific to a landmine/UXO/IED threat. The document was kindly made available by UNICEF. It corresponds with the route card (see previous page).

A1.3.1 Pre-road movement preparations

Even in areas which are generally secure, travel by vehicle can be a hazardous undertaking due to the risk of mechanical failure, accident, common crime and auto theft. This risk can be significantly reduced by travelling, when possible, in convoy with other vehicles.

A1.3.1.1 TEAM LEADER RESPONSIBILITIES

Every road mission must have one individual who is responsible for the management of the mission. This person is known as the "Team Leader". The following actions should be taken prior to the departure:

- Prepare a full list of vehicles to be used, including the registration numbers, the names of the drivers to be assigned to each vehicle and the place of each vehicle in the convoy;
- In case of ECM use, plan the place of each vehicle so that the ECM bubble(s) overlaps the convoy;
- Prepare a full list of all persons in the convoy and assign responsibilities;

- Ensure that security clearance has been obtained;
- Ensure that you have full information regarding the area(s) to be visited, as well as the current situation (terrain, weather, services available, listings of contact persons en route and at destination, etc.);
- When travelling to the area, ensure that you speak with the local authorities (village leaders, police, army personnel, the nearest mine clearance organization or the MN EOD CC/ NPOC EOD of Peacekeeping-, Observing- or Training- Mission Contingents) regarding your movement as well as security conditions;
- Check that procedures are in place to assist you in case of emergency (such as a requirement for medical evacuation);
- Determine if escort by a security force is necessary. If so, ensure it is requested as far in advance as possible but at least 48 hours before intended departure;
- Define angles and areas of surveillance between the passengers in the cars and
- Brief all participants.

A 1.3.1.2 DEVELOPMENT OF A ROUTE PLAN

It is essential that as much information as possible is gathered about the route prior to departure.

- Do your research. Find out all you can about the road conditions; talk to others who have been on the route recently;
- Obtain up-to-date information on possible security risks;
- Measure the route to be travelled and divide the journey into

sections; determine the estimated time of arrival for each section. Pre-determine where the convoy will stop to rest;

- A (simple) contingency plan should also be prepared in the event of injury, breakdown, etc.;
- Procedures for aborting the operation must be included in the route plan;
- Do not travel after dark; ensure that all timings on your route plan enable you to reach a selected location well before nightfall;
- Ensure vehicle weight and height do not exceed bridge/underpass specifications and
- Declare that the convoy has been briefed prior to its departure.

A1.3.1.3 COMMUNICATIONS

United Nations vehicles used in road mission should have HF and VHF radios. In convoys, there must be a HF and VHF radio. The VHF radio must have the Simplex channel fitted. [This is the system of straight VHF radio to VHF radio communications — from one vehicle to another in this case.]¹⁶

Prior to departure, the following communications planning is essential:

- Check radio equipment and ensure that the first and last vehicles have radios;
- Be advised that the use of ECM can hamper the Radio

¹⁶ “Simplex”: The transmission does not go through a “Repeater” and uses a single frequency only. “Duplex” uses two frequencies, one to transmit and one to receive. This system goes through a repeater and gives extended range to VHF.



PICTURE A1.2
Slippery ground
in a small river;
South Sudan. UN Photo

Communication. Additional signs with headlights or by hand/flags has to be arranged;

- Confirm frequencies;
- Maintain the time schedule for radio checks with base station;
- Ensure that you are aware of all call signs, cell phone call numbers¹⁷, and any special procedures to be observed;
- Ensure that the people operating the radios in the convoy are aware of all the above, and know that they must speak clearly and concisely on the air;
- Radio communications must be established before departing and radio location-reports are to be sent at least every hour or, for convenience, whenever passing well-known locations. The primary base station is to be informed by vehicle or agencies of every report. When missions are completed, the base station should be notified.

A1.3.1.4 DRIVER RESPONSIBILITIES AND VEHICLE REQUIREMENTS

International missions require two MOSS-compliant vehicles.¹⁸ In most cases, national staff members are able to travel in one MOSS-compliant vehicle, preferably with three people on board. At times there will be mandatory requirements for national staff to travel in two MOSS-compliant vehicles as the security situation dictates and as decided at Inter-Agency meetings. It is essential that the vehicles in the convoy are well maintained and roadworthy. Staff should:

¹⁷ SELCAL - Self Call, number to call an individual radio – usually from another VHF-radio.

¹⁸ MOSS: Minimum Operating Security Standards are a United Nations policy document. The purpose of MOSS is to establish standard field based criteria for minimum security arrangements to enhance staff security and reduce risk to enable UN field operations.

- Ensure that all vehicles are suitable for the terrain to be traversed;
- Check that all vehicles are correctly marked (i.e., determine if United Nations flags or decals are to be used);
- Ensure that each vehicle is fitted with a first aid kit, fire extinguisher, water jerry can and fuel jerry can, spare wheel, jack and appropriate tools;
- Check that all vehicles are in good condition for the journey and that all have the equipment necessary to make repairs such as changing a flat tire;
- Check that all vehicles start off with a full fuel tank;
- Ensure that the convoy is of a manageable size, commensurate with the number of escorts, if applicable;
- In countries with a terrorist/war threat environment, operational vehicles travelling in conflict or other dangerous areas must also have:
 - One set of body armour each for the driver and passengers;
 - A ballistic blanket and blast resistant film fitted on windows;
- Depending on the IED threat, a jammer could be necessary.

A1.3.1.5 BRIEFING

It is mandatory to inform all participants about the travel situation/mission prior to departure, as follows:

- Hold a briefing for all involved and ensure everyone understands his/her responsibilities, convoy procedures and contingency plans;

- Ensure that the actual speed of the convoy is appropriate to the condition of the roads and the slowest vehicles;
- Define angles and areas of surveillance between the passengers in the cars;
- Give advice to rules of the behaviour in road traffic;
- Speak about possible risks;
- Provide instructions about
 - Procedures at formal check points and roadblocks;
 - Measures in case of a breakdown;
 - Actions to be taken in case of IED attack, ambush or combat.
- If the convoy is being escorted by security forces, the convoy commander must ensure that the escorting force is briefed on the convoy plan, route, speed and other details and
- In the event of an accident, ensure that the convoy knows what to do.

**PICTURE A1.3**

Bottlenecks are a good opportunity for an ambush; Balkans.

UNMAS Photo/Thomas Enke

A1.3.2 On road movement behaviour

Road traffic, especially in towns, could be very critical. For the rear vehicles in convoys it could be difficult to follow the leading vehicle, get a good picture of the situation and react to unpredictable situations.

To improve and secure the driving in convoys:

- Drive with discipline;
- With the ordered space between the vehicles (ECM!) and
- Use your seatbelts;

The leading vehicle announces on the radio:

- The direction to take on junctions;
- Special observations like obstacles, choke points, bottle necks (unexpected halts) and
- Meeting points in case of an emergency.

The last vehicle announces on the radio:

- The passing of junctions, choke points and bottle necks;
- Unwanted intrusions of others vehicles in the convoy and
- Technical problems, failure of vehicles.

Annex A2 Measures to provide additional protection to a vehicle

Normal vehicles cannot withstand the blast of an anti-vehicle (AV) mine or an IED. The best advice is therefore to stay away from mine/UXO/IED-affected areas altogether. In particular, no travel should be undertaken on roads where the presence of these EO is suspected.

This basic safety principle notwithstanding, there may be circumstances where it is both appropriate and practical to purchase a “mine protected” vehicle or to install additional protection to existing vehicles. The advice of your head office and suitably qualified personnel should be sought.

Some of the measures that specialists may recommend include:

Case study

A few years ago, a Land Cruiser with a full passenger load hit an anti-vehicle mine in South East Angola, killing seven and injuring six of the passengers.

While the initial blast was devastating to the vehicle it is believed that some of the deaths could have been prevented if the passengers had been wearing seat belts, as the blast catapulted the car into the air and crushed the passengers against the inside of the vehicle.

A2 Measures to provide additional protection to a vehicle

- Consider purchasing a purposely built or custom designed mine-protected vehicle, for example Casspir or Wolf vehicles. The v-shaped construction of the underside of the vehicle offers the best protection to deflect a blast.
- In exceptional circumstances, protection may be added to soft-skin vehicles. This add-on protection will not provide the same protection as a mine-protected vehicle, but will mitigate some of the effects of an explosion. These measures include:
 - o Fitting “ballistic blankets” or armour plating like polycarbonate or nylon-ceramics. Before taking either measure, a full analysis of the pros and cons of the technology should be undertaken.
 - o Fitting roll bars. Roll bars in the back of a vehicle can be fitted if passengers have to sit there. The passengers should be seated on benches and strapped in, preferably with four-point harnesses. Ensure that the back benches are equipped with seat-belts as a minimum.
 - o Fitting blast-resistant film. Covering windows with blast-resistant film can prevent them from shattering in the event of an explosion.
- Equipping all vehicles with fire extinguishers and medical kits.
- Strict vehicle loading discipline. Unsecured items inside a vehicle can greatly increase injuries in the event of an accident following a mine strike. Fuel cans should never be carried inside a vehicle.
- Equipping the vehicles with ECM should help against RC-IEDs. But this presupposes a proper assessment of the frequencies and a good training of the operator.



PICTURE A2.1

The performance of a ballistic blanket, outside and inside of a door of a car. No fragments are seen at the inside part of the door; Afghanistan. Photos/ German Forces

Annex A3 5/25 metre check

If you are driving in an area with an IED threat and you have to stop (regardless of the reason for stopping) you must make a 5/25m check. For a short halt, the passengers have to clear 5 metres around the vehicle. For extended halts an area of 25 metres around the vehicle has to be cleared.

Before you stop, be watchful. Look for shafts and holes in the ground, traces of digging and change in the colour of the surface. Not only rubbish or trash, every conspicuous thing could be dangerous. Look for roofs, walls and other cars. Take care about the visibility to the halt position and lines of sight.

After stopping the vehicle do not leave the vehicle, take a systematical observation (360 degrees and top to bottom). Look again for shafts and holes and any other item described above. Every passenger is responsible for an angle of observation.

Now leave the car, but do not stop the engine. Passengers from the left side control the left side, passengers from the right side the right side, but work overlapped and systematically. Close the doors and control the vehicle for damages and conspicuous devices (including underneath the vehicle). Search close to the vehicle. Is anyone watching your activities (spotter/triggerman)?

Ask others, if you have doubts.

Start the 5 metre check. Search in a radius of 5 metres around the vehicle. Ensure that you overlap, if more than one person is searching, they will look for conspicuous things with different



PICTURE A3.1
At every stop, conduct the 5/25 metre check; Afghanistan. UNMAS Photos/Thomas Enke

viewpoints. Look under the vehicle (again!).

Conduct the 25 metre check. Search in a radius of 25 metres. Go around shrubs and isolate the area, cover the search if needed. Look for markers and signs of an ambush. Do not approach suspicious items. Use binoculars and digital cameras for clearer identification of objects.

Annex A4 Other threats

A4.1 DEPLETED URANIUM

Depleted uranium (DU) is very dense; at $19,050 \text{ kg/m}^3$, it has 1.67 times the density of lead ($11,340 \text{ kg/m}^3$). In combination with 2 % molybdenum or 0.75 % titanium and a special temperature treatment it will be hard, like tungsten carbide. DU is cheap; it cost less than 20 % of the equivalent of tungsten. Depleted uranium is toxic and, over a long period, can have long-term health effects.

As a by-product of uranium enrichment, DU became less expensive than other high-density ordnance candidates including tungsten in the 1960s. As the next best candidate, tungsten had to be obtained from China. With DU stockpiles estimated to be more than 500,000 tons, it was more economical to use depleted uranium than to store it. Thus, from the late 1970s, the U.S., the former Soviet Union, Britain, and France began converting their stockpiles of depleted uranium into kinetic energy penetrators.

Also depleted uranium is used in making armour plating for tanks and other military vehicles, and is used for aircraft stabilisers and in the keel of racing yachts.

On impact with a hard target, such as an armoured vehicle, the nose of the rod fractures in such a way that it remains sharp. The impact and subsequent release of heat energy causes the projectile to disintegrate to dust, and burn when it reaches air, because of its pyrophoric properties. When a DU penetrator reaches the interior of an armoured vehicle, it catches fire, often igniting ammunition and fuel, killing the crew, and possibly causing the vehicle to explode.

Due to the special temperature treatment as sintered metal the surface of a fired DU-penetrator, it will seclude DU dust until the whole projectile will be only dust. This makes any DU souvenir very dangerous for the health.

Depleted uranium has a residue that can sometimes be recognized as a black or green, soot-like dust. If dust is not visible, never assume that depleted uranium residue is not present.

Depleted uranium can be inhaled, swallowed or enter the body through cuts and abrasions. So long as depleted uranium remains outside the human body, experts consider that it is of negligible harm.

Some simple rules to limit exposure to depleted uranium include:

- Never enter or climb on or around damaged military equipment;
- Do not touch or approach military debris, ammunition casings, unexploded ordnance, and damaged or abandoned military vehicles and
- Do not collect war souvenirs.

Case study

Depleted uranium was heavily used in the 1991 Gulf War. Almost one million depleted uranium rounds were fired equalling 340 tons; in the Balkans an estimated 11 tons were fired in the late 1990s.

Approximately 75 tons of depleted uranium munitions were used by United States troops in the recent Gulf War.

Christian Science Monitor,
www.csmonitor.com/2003/0515/

Nevertheless, health data on the long-term effects of depleted uranium are still limited and the health effects of depleted uranium are highly contested.

If you come in contact with depleted uranium:

- Cover your mouth;
- Leave the area;
- Wash your hands and face with soap and water and
- Wash your clothes.

More comprehensive information can be found at:

en.wikipedia.org/wiki/Depleted_uranium

Currently more than hundreds of references are attached.

A4.2 BIOLOGICAL AND CHEMICAL WEAPONS

A biological weapon is designed to release germs or other biological substances that can make you seriously ill or kill you. Many biological agents must be inhaled, enter through a cut in the skin or be eaten to make you sick. Some biological agents, like the smallpox virus, are contagious and if you are exposed, you risk exposing others.

A chemical weapon is designed to release toxic gas, liquid or solids that can poison people, through inhalation or contact with the skin and the environment. Many chemical weapons burn skin.

Chemical and biological weapons are commonly delivered by missile warheads, rockets, aerial bombs, artillery rounds, and aerial spray tanks. Also, abandoned and/or destroyed biological and chemical plants can lead to a risk with the same hazards.

While chemical and biological agents usually dissipate quite quickly, abandoned weapons systems may still contain hazardous



PICTURE A4.1

One of the risks of abandoned and destroyed fighting vehicles is the contamination with depleted uranium; Afghanistan. UNMAS Photo/ Thomas Enke

substances. The best advice is to stay away from weapons depots and abandoned ordnance, suspicious liquids and containers.

Possible signs of chemical or biological threat:

- Airborne gasses;
- Unusual liquids and containers;
- Atypical odour;
- Many people suffering from watery eyes, twitching, choking, difficulty breathing or loss of coordination;
- Many sick or dead birds, fish or small animals are also cause for suspicion and
- Sudden onset of illness by you or your colleagues.

If you become aware of an unusual and suspicious airborne substance nearby:

- Use an CBRN-Mask;
- Find clean air quickly;
- Quickly try to define the impacted area, and where the chemical is coming from;
- Take immediate action to get away. Stay up-wind of any potential hazard;
- Cover your mouth and nose with layers of fabric that can filter the air but still allow breathing;
- If the substance is inside a building where you are, get out of the building without passing through the contaminated area, if possible;
- If you can't get out of the building or find clean air without passing through the area where you see signs of a chemical attack, it may be better to move as far away as possible;

- Wash with soap and water and
- Contact authorities (e.g. mine action agencies, United Nations security officers, Tactical Operations Centre of Peacekeeping-, Observing- or Training-Mission Contingents).

If your eyes are watering, your skin is stinging, and you are having trouble breathing, you may have been exposed to a chemical agent.

If you think you have been exposed to a chemical agent:











- Do not drink, eat or smoke;
- Strip immediately and wash;
- Look for a hose, fountain, or any source of water, and wash with soap if possible, being sure not to scrub the chemical into your skin and
- Seek emergency medical attention.

If you think you have been exposed to a biological agent:

- Do not drink or eat;
- Practice good hygiene and cleanliness to avoid spreading germs;
- Wash your hands with soap and water frequently;
- Do not share food or utensils;
- Cover your mouth and nose when coughing or sneezing;
- Share health-related information with others, especially those who may need help understanding the situation and what specific actions to take and
- Seek medical advice.

For detailed advice consult en.wikipedia.org/wiki/CBRN_defense

Annex A5 Evacuation distance guide

 UNMAS		EVACUATION DISTANCE GUIDE		
THREATS		EXPLOSIVE WEIGHT <small>250 KG/550 LBS**</small>	MINIMUM EVACUATION DISTANCE <small>BEHIND WALL**</small>	RECOMMENDED EVACUATION DISTANCE <small>IN THE OPEN**</small>
PIPE BOMB		2.9 kg 5 lbs	130 m 430 ft	375 m 1,200 ft
SUICIDE BOMBER		9,0 kg 20 lbs	150 m 500 ft	525 m 1,700 ft
BRIEF CASE/ BACKPACK		23 kg 50 lbs	190 m 600 ft	575 m 1,900 ft
COMPACT CAR		230 kg 500 lbs	270 m 870 ft	600 m 2,100 ft
FULL SIZE CAR		460 kg 1,000 lbs	300 m 1,000 ft	725 m 2,400 ft
VAN/ SUV		1,800 kg 4,000 lbs	375 m 1,225 ft	1,160 m 3,800 ft
SMALL TRUCK/ MOVING VAN		4,600 kg 10,000 lbs	440 m 1,450 ft	1,560 m 5,100 ft
WATER TANKER		13,600 kg 30,000 lbs	525 m 1,725 ft	2,410 m 7,900 ft
SEMI-TRAILER		27,200 kg 60,000 lbs	575 m 1,875 ft	2,840 m 9,300 ft

* Distance of 100 m (328 ft) is the minimum recommended for the majority of threats listed in this table.

** This column distance is for unarmored (passenger) vehicles. Armored vehicles and other vehicles equipped with armor, fire blankets and fire extinguishers do not fall into this category.

** If there is no barrier behind the vehicle, the minimum recommended distance is 1.5 times the distance listed in this table.

UNMAS.ORG

Annex A6 Nine-liner

REPORTING AN EO/IED

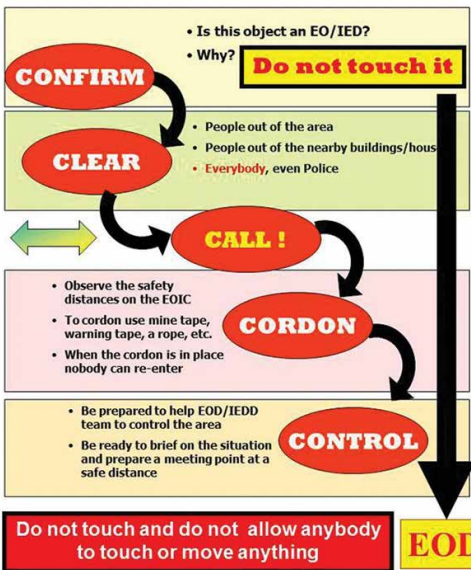
INFORM YOUR SUPERIORS THROUGH THE CHAIN OF COMMAND



A	Priority for requesting unit	Immediate – urgent – routine – no threat –
B	Incident reported by	1 Rank or position
		2 Contact name
		3 Unit identifier
		4 Contact method
C	POC for further information	1 Rank or position
		2 Contact name
		3 Unit identifier
		4 Contact method
		5 Rendezvous EOD team
D	DTG of EO/IED discovery	EO/IED was
E	Location / area of EO/IED	1 Grid reference
		2 Additional location
		3 Under water
		4 Buried
F	EO identification estimate	What? How (use ID, GAT)
G	Safety measures undertaken	1 Evacuation
		2 Other protective
H	Effect on operation	Totally disrupted
I	Other significant info	
J	Date and signature	

NEVER	<ul style="list-style-type: none"> TOUCH, MOVE OR DISTURB USE A MOBILE PHONE OR RADIO ALLOW ANYONE TO RE-ENTER GIVE INFORMATION TO CIVILIANS

FIRST RESPONSE TO AN EO/IED CALL OUT



Annex A7 Glossary

This glossary provides simple explanations for some of the technical terms included in this handbook. The aim is to assist the reader, and not to replace or amend in any way existing legal or technical definitions, such as those found in the 1980 Convention on Certain Conventional Weapons and its annexed Protocols, or the 1997 Convention on the Prohibition on the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction (often referred to as the Anti-Personnel Mine-Ban Treaty or Ottawa Treaty/Convention).

ABANDONED IED (also called REMNANT IED)

An abandoned Improvised Explosive Device is defined as a nonstandard device that has not been used, but is no longer in the control of any particular force. Due to the use of homemade explosives, fuses and other parts of abandoned IEDs are very hazardous and can be unstable. They could be exploded by any touch or also by change in the conditions of the surroundings. Also IEDs have been used to protect (abandoned) weapon and ammunition caches.

ABANDONED ORDNANCE

Abandoned ordnance (AO) is ordnance that has not been used, but is no longer in the control of any particular force. AO could include mortar rounds, grenades, bombs, rockets, bullets, artillery rounds and so on. Sometimes abandoned ordnance may include small caches of weapons which have been lost in the course of fighting only to turn up later.



PICTURE A6.1
An uncleared minefield
70 years after the
Second World War;
Germany, Photo by
Markus Schweiss

ANTI-PERSONNEL MINE

A landmine designed to injure or kill one or more persons. Anti-personnel mines are usually detonated when they are stepped on or when a tripwire is disturbed, but they can also be set off by the passage of time or by controlled means. Anti-personnel mines can be secured against removal and could also be found in combination with anti-vehicle mines.

ANTI-VEHICLE MINE

Often referred to as anti-tank mines, anti-vehicle mines are landmines designed to disable or destroy vehicles, including tanks. Like anti-personnel mines, anti-vehicle mines can be detonated by pressure (though normally much greater weight is needed) or remote control, as well as by magnetic influence or through the disturbance of a tilt rod (a type of vertical tripwire). Anti-vehicle mines can be secured against removal and could also be found in combination with anti-personnel mines.

BOOBY TRAP

An explosive or non-explosive device, deliberately placed to cause casualties when an apparently harmless object is disturbed or a normally safe act is performed, like opening a door or turning on a television. All booby traps that use explosives are considered improvised explosive devices (IEDs).

BOUNDING MINE

An anti-personnel mine which is set off by a tripwire or pressure and then explodes in the air at a predetermined height, scattering fragments in all directions.

EXPLOSIVE REMNANTS OF WAR

All ordnance that remains after armed conflict and which have an explosive potential. This includes unexploded ordnance, abandoned ordnance, booby traps, IEDs, and in some circumstances abandoned or destroyed military vehicles and equipment. In international legal parlance, explosive remnants of war (ERW) do not normally include landmines, as landmines and ERW are dealt with under two distinct international conventions: the Anti-Personnel Mine-Ban Treaty and the Convention on Certain Conventional Weapons (Protocol V).

FUSE

A fuse is the functioning component of ammunition that allows the ammunition to detonate or function as designed when used.

IMPROVISED EXPLOSIVE DEVICE

An improvised explosive device (IED) is defined as a nonstandard device, usually fabricated from readily available material. It incorporates explosives or other (CBRN-) agents and has destructive, lethal or noxious properties. High quality, series production, technology transfer and further development make IEDs into a serious hazard.

MINE ACTION

Activities that address the threat of landmines, ERW and remnant IEDs to civilian populations. Mine action usually includes five mutually supporting activities, including:

- Risk education and awareness raising;
- Advocacy to ban landmines and other weapons that have indiscriminate effects;

- Assistance to victims of landmines, ERW and remnant IEDs;
- Mine clearance and explosive ordnance disposal; and
- The destruction of stockpiled landmines.

Mine action does not generally include the removal or destruction of improvised explosive devices. More often such threats are dealt with by security forces, such as the police.

MINE ACTION CENTRE

A centre that coordinates and regulates mine action activities within a country. A government or the United Nations usually runs such centres.

MINE MARKING

The organized marking of minefields. Standard, easily recognizable mine warning signs are placed around the perimeter of the minefield to alert people to the presence of mines.

REMNANT IED

See ABANDONED IED

TILT ROD

A post or pole attached to a fuse mechanism on the upper surface of a mine. Pressure exerted on the tilt rod sets off the mine.

TRIPWIRE

A thin, non-reflective metal or coloured wire, which can be used as a mechanism to trigger an anti-personnel mine or a booby trap. A tripwire is usually stretched low above the ground so that any passer-by will “trip” over it, thus setting off the explosive.

UNEXPLODED ORDNANCE

Explosive munitions that have not yet been set off. Unexploded ordnance (UXO) may already have been fired, dropped, or launched, but has failed to detonate as intended.

Annex A8 Common abbreviations

AN (FO)	Ammonium Nitrate (Fuel Oil)
ANS	Ammonium Nitrate Sugar
AP	Armor Piercing
APDSFS	Armor Piercing Discarding Sabot Fin Stabilized
API	Armor Piercing Incendiary
APSE	Armor Piercing Secondary Effect
AP Mine	Anti-Personnel Mine
AT Mine	Anti-Tank Mine
AV Mine	Anti-Vehicle Mine
BI	Blast Incendiary
BIP	Blow in place
Blank	Drill-Ammunition
CEX	Commercial Explosives
CJEODC	Combined Joined EOD CELL
CN/CS	Anti Riot Ammunition (e.g. Tear Gas)
CO-IED	Command Operated Improvised Explosive Device
CP	Contact Point
CP-IED	Command Pulled Improvised Explosive Device
CW-IED	Command Wire Improvised Explosive Device

A8 Common abbreviations

DIME	Dense Inert Metal Explosives
DFC	Direct Focused Charge
DFFC	Direct Fragment Focused Charge
DP	Dual Purpose (=HE/HEAT)
ECM	Electronic Countermeasures
EFP	Explosive Formed Projectile
EO	Explosive Ordnance
EOD	Explosive Ordnance Disposal
EOD CC	EOD Coordination Cell
EOR	Explosive Ordnance Reconnaissance
ERW	Explosive Remnants of War
FAE	Fuel Air Explosives
FP	Firing Point
FRAG	Fragmentation
HC	Hexachlorethan (Smoke composition)
HC-HQ	Higher Command Headquarter
HE	High Explosive
HEAT	High Explosive Anti-Tank
HEI	High Explosive Incendiary
HESH	High Explosive Squash Head
HME	Home Made Explosives
HVAP	High Velocity Armor Piercing

A8 Common abbreviations

I	Incendiary
IAAG	Improvised Anti Armour Grenade
IATG	International Ammunition Technical Guidelines
ICM	Improved Conventional Munition
ICP	Incident Control Point
IED	Improvised Explosive Device
IEDD	Improvised Explosive Device Disposal
IID	Improvised Incendiary Device
ILLUM	Illumination
IMAS	International Mine Action Standard
IR	Infra Red
LC	Light Command
LCC-HQ	Land Component Command Headquarter
LMC-PP	Low Metal Contact-Pressure Plate
MA-IED	Magnetically Attached IED
MNEOD CC	Multinational EOD Coordination Cell
MILEX	Military Explosive
PB-IED	Person Borne Improvised Explosive Device
PC-IED	Projectile Controlled Improvised Explosive Device
PIR	Passive Infra Red
PP-...	Pressure Plate-...
PR-...	Pressure Release-...
PRAC	Practice
PSSM	Physical Security and Stockpile Management (US-Term of WAM)

A8 Common abbreviations

RC-IED	Radio Controlled Improvised Explosive Device
RDX	Hexogen (High Explosive)
RFT	Radio Fob Trigger
RSP	Render Safe Procedure
SALW	Small Arms and Light Weapon
SBIED	Suicide Bomber Improvised Explosive Device
SDC	Self Destruct Charge
STANAG	NATO Standardization Agreement
SVBIED	Suicide Vehicle Borne Improvised Explosive Device
TO-IED	Time Operated Improvised Explosive Device
TPU	Time and Power Unit
TTP	Tactics, Techniques, Procedures
USBV	Unkonventionelle Spreng- und Brandvorrichtung (Improvised Explosive and Incendiary Device)
UVIED	Under Vehicle Improvised Explosive Device
UXO	Unexploded Explosive Ordnance
VBIED	Vehicle Borne Improvised Explosive Device
VCP	Vehicle Check Point
VOIED	Victim Operated Improvised Explosive Device
VP	Vulnerable Point
WAM	Weapon and Ammunition Management (UN-Term of PSSM)
WP	White Phosphorous (Smoke composition)
WET	Weapons Exploitation Team
WIT	Weapon Intelligence Team (former definition of WET)

Annex A9 Further sources of information

General information:

www.mineaction.org/unmas

www.gichd.org

www.peaceopstraining.org

www.jmu.edu/cisr/index.shtml

Technical advise:

www.un.org/disarmament/un-safeguard/guide-lines

www.mineactionstandards.org

Special information about ammunition:

www.cat-uxo.com

www.rwd-mb3.de

www.lexpev.nl

and others...

Emergency contacts

Use this space to write down the contact details, numbers, and/or frequencies of the following:

Security officer(s), medical centres, radio room operators, Mine Action Centre, "home base" (Headquarters), etc.

Notes

Notes



UNMAS

UNITED NATIONS

UNITED NATIONS MINE ACTION SERVICE (UNMAS)

NEW YORK, NY 10017 USA

E-MAIL: MINEACTION@UN.ORG

WEBSITE: WWW.MINEACTION.ORG