

Field Manual No. 21-16 HEADQUARTERS
Fleet Marine Force DEPARTMENT OF THE ARMY
Manual No. 13-8-1 US MARINE CORPS
Washington, DC, 30 August 1994

UNEXPLODED ORDNANCE (UXO) PROCEDURES

CONTENTS

	Page
PREFACE	iv
Purpose.....	iv
Scope.....	iv
Training Strategy.....	vi
User Information.....	vi
CHAPTER 1. THE UXO HAZARD	1-1
UXO Locations and Threats.....	1-1
General Safety Guidelines.....	1-2

DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited.

*This publication supersedes FM 9-16, 30 July 1981.

Marine Corps PCN: 139 714000 00

CHAPTER 2. RECOGNIZE UXO	2-1
Dropped Ordnance	2-1
Projected Ordnance	2-17
Thrown Ordnance	2-25
Placed Ordnance	2-29

CHAPTER 3. TAKE IMMEDIATE ACTION	3-1
Protective Measures	3-2
Mark UXO	3-9

CHAPTER 4. REPORT THE UXO HAZARD	4-1
UXO Spot Report	4-1
Prioritizing the Spot Report	4-3

CHAPTER 5. SELF-EXTRACTION FROM UXO HAZARDS	5-1
Detection	5-1
Immediate Actions	5-2
Situational Assessment	5-3
Breaching Techniques	5-3

APPENDIX A. AMMUNITION COLOR CODES	A-1
---	-----

APPENDIX B. DROPPED ORDNANCE IDENTIFICATION AND NET EXPLOSIVE WEIGHTS	B-1
Bombs	B-1
Dispenser	B-3
Submunitions	B-4

**APPENDIX C. PROJECTED ORDNANCE IDENTIFICATION
AND NET EXPOSIVE WEIGHTS**.....C-1

Projectiles.....C-1
MortarsC-9
RocketsC-12
Guided Missiles.....C-16
Rifle GrenadesC-18

**APPENDIX D. THROWN ORDNANCE IDENTIFICATION
AND NET EXPLOSIVE WEIGHTS**D-1

Fragmentation Grenades.....D-1
Antitank GrenadesD-2
Smoke GrenadesD-3
Illumination GrenadeD-5

**APPENDIX E. PLACED ORDNANCE IDENTIFICATION
AND NET EXPLOSIVE WEIGHTS**E-1

Antipersonnel Mines.....E-1
Antitank Mines.....E-3

GLOSSARYGlossary-1

REFERENCESReferences-1

Documents NeededReferences-1
Readings RecommendedReferences-1

INDEX.....Index-1

PREFACE

PURPOSE

Field Manual (FM) 21-16/Fleet Marine Force Manual (FMFM) 13-8-1 prescribes the doctrine for dealing with the unexploded ordnance (UXO) hazards on the battlefield. Use the information in this manual to teach military personnel, Department of Defense (DOD) civilians, and contractors about the UXO hazards they could meet and the procedures they can use to protect themselves. This manual also gives guidance on how to get help to take care of the hazards that affect mission capabilities.

When personnel find UXO, they must follow these steps:

Ž Recognize the UXO hazard.

Ž Take immediate action (mark and evacuate).

Ž Report the UXO hazard.

Ž Use protective measures against the UXO hazard, if required.

Based on these steps, FM 21-16/FMFM 13-8-1 serves as a general guideline for including UXO hazard procedures in unit standing operating procedures (SOPs). This manual provides information for transmitting and monitoring UXO reports throughout any battlefield functional area (BFA).

SCOPE

UXO on the battlefield affects the mobility and mission aspects of all units. Battlefields are littered with UXO hazards from two sources: ordnance that has either failed to function or ordnance designed to be used for area denial, such as conventional land mines and the family of scatterable mines (FASCAM). With the sophistication of modern weapons systems, battlefield commanders can target anything within their theater of operations. After these attacks are completed, UXO hazards will probably be left on the battlefield.

UXO hazards may not always pose an immediate threat to unit mission or mobility, but they are hazards that have in the past caused needless loss of life and materiel. Battlefield commanders need to know where UXO hazards are, as these hazards can affect the mobility of follow-on elements. This manual teaches personnel about the UXO hazard and how this hazard affects mission capabilities and what procedures are used to report and protect personnel and equipment. All units should be able to react to the UXO hazard effectively and to report and protect against it.

During mission planning, leaders must coordinate with supporting artillery and supporting air liaison personnel to find out what areas are expected to contain large numbers of UXO. These areas should be avoided if possible. This type of planning makes a unit more mission capable.

There are two types of UXO threats on the battlefield: passive (UXO that is found during unit movement) and active (UXO that results from an attack). All units must be able to react to both of these types of threats in order to survive on the modern battlefield. Chapter 5 of this manual covers procedures for reacting to these threats. Additional information may also be found in FM 20-32, Chapter 11.

All military personnel and certain DOD civilians and contractors risk injury or death from UXO. Therefore, all of these personnel need to understand how to identify, report, mark and, if necessary, apply protective measures against UXO. This manual was designed to be used by all of these personnel. All users of this manual are referred to as personnel in the text.

This manual implements the following international standardization agreements (STANAGs):

Ž STANAG 2002 (Edition 7). *Marking of Contaminated or Dangerous Land Areas, Complete Equipment, Supplies, and Stores*. See Chapter 3.

Ž STANAG 2143 (Edition 4). *Explosive Ordnance Reconnaissance/Explosive Ordnance Disposal (EOR/EOD)*.

TRAINING STRATEGY

For training to be effective, users of this manual must adopt the procedures outlined into their combat training and unit SOPs. UXO training can be conducted concurrently with all common and collective training. It can be incorporated into training in the same way as nuclear, biological, chemical (NBC) training. Using the full-scale training aid package listed below, training can be conducted during land navigation, road marches, defensive/offensive operations, or force-on-force training. Preparation time is minimal; just place the training items where personnel will encounter them during normal training operations.

Evaluation of the training will depend on current mission and unit SOPs. The three most important points for the trainee to remember are the following:

- Ž If possible, avoid the item and continue the mission.
- Ž If avoidance is not possible, take protective measures to reduce the hazard to personnel and equipment.
- Ž And, regardless of the action you take, report the hazard through command channels.

USER INFORMATION

The following training items are available at your local training aids support center (TASC) for you to use in your unit's UXO training program:

- Ž Graphic Training Aid (GTA) 9-12-1, *Unexploded Ordnance (UXO) Procedures*.
- Ž DVC-T 5-47, Full-scale UXO training-aid package.
- Ž Safety Video 709919, "Danger UXO."
- Ž Instructional Video 710288, "The UXO Hazard."

This manual is the reference for the following soldier training publication (STP) common tasks:

- Ž STP 21-1 -SMCT (new edition to be published in FY 94), *Identify UXO Hazards*, task number 093-403-5000.

Ž STP 21-24-SMCT:

-*Recognize Military Ordnance by Type*, task number 093-403-5010.

-*Take Immediate Action Based on Confirmation of an Explosive Hazard*, task number 093-403-5020.

-*Report Explosive Hazard*, task number 093-403-5030.

Any reference made in this manual to the former Soviet Union, or to Soviet-style ordnance, refers to the type of ordnance that was produced and distributed by the Soviet-block countries. This type of ordnance is still found stockpiled and is being sold throughout the world. United States (US) forces will find this type of ordnance on future battlefields.

While personnel are not expected to determine ordnance fillers, the color codes on the ordnance (Soviet-style and US) help to identify the types of UXOs. See Appendix A.

The proponent of this publication is Headquarters, United States Army Training and Doctrine Command (HQ TRADOC). Send comments and recommendations on DA Form 2028 to Commandant, United States Army Ordnance Missile and Munitions Center and School, Attention: ATSK-CCD, Redstone Arsenal, Alabama 35897-6500.

C H A P T E R 1

T H E U X O H A Z A R D

There were 21 US Army personnel killed and 53 injured during Operation Desert Storm as a direct result of handling UXO. Every person on the battlefield must be able to recognize and react to these hazards. Likewise, every leader must ensure that all personnel know how to recognize and react to these hazards.

UXO LOCATIONS AND THREATS

UXOs are hazards—whether on the battlefield or in designated impact areas. UXO includes ordnance items that have been fired, projected, dropped, or placed in such a way that they could become armed and go off. Whether in an area by design or accident, these items have not yet functioned. Whatever the reason, UXO poses the risk of injury or death to all personnel.

The EOD mission is to eliminate or reduce the threat of UXO hazards. The engineer mission is to clear minefield and wide areas of area-denial submunitions. However, these two groups individually or together will be unable to react immediately to an enemy submunitions or scatterable-mine attack on a position. Any unit that cannot extract itself from these attacks risks being fixed in place and destroyed by follow-on enemy fire.

In wartime there are two types of UXO threats, passive and active. The passive threat refers to any ordnance found by personnel as they move across the battlefield. The active threat refers to any ordnance that remains in the area after a direct attack on a position. All units must be able to react to both types of UXO threats in order to survive on the battlefield.

In addition to the battlefield, UXOs are also found in designated impact areas. These areas are marked on all military maps, and they