

Joint Publication 3-15



Barriers, Obstacles, and Mine Warfare for Joint Operations



26 April 2007



PREFACE

1. Scope

This publication provides doctrinal guidance for planning and executing barrier, obstacle, and mine warfare for joint operations as they relate to strategic, operational, and tactical mobility and countermobility across the range of military operations.

2. Purpose

This publication has been prepared under the direction of the Chairman of the Joint Chiefs of Staff. It sets forth joint doctrine to govern the activities and performance of the Armed Forces of the United States in operations and provides the doctrinal basis for interagency coordination and for US military involvement in multinational operations. It provides military guidance for the exercise of authority by combatant commanders and other joint force commanders (JFCs) and prescribes joint doctrine for operations and training. It provides military guidance for use by the Armed Forces in preparing their appropriate plans. It is not the intent of this publication to restrict the authority of the JFC from organizing the force and executing the mission in a manner the JFC deems most appropriate to ensure unity of effort in the accomplishment of the overall objective.

3. Application

a. Joint doctrine established in this publication applies to the commanders of combatant commands, subunified commands, joint task forces, subordinate components of these commands, and the Services.

b. The guidance in this publication is authoritative; as such, this doctrine will be followed except when, in the judgment of the commander, exceptional circumstances dictate otherwise. If conflicts arise between the contents of this publication and the contents of Service publications, this publication will take precedence unless the Chairman of the Joint Chiefs of Staff, normally in coordination with the other members of the Joint Chiefs of Staff, has provided more current and specific guidance. Commanders of forces operating as part of a multinational (alliance or coalition) military command should follow multinational doctrine and procedures ratified by the United States. For doctrine and procedures not ratified by the United States, commanders should evaluate and follow the multinational command's doctrine and procedures, where applicable and consistent with US law, regulations, and doctrine.

For the Chairman of the Joint Chiefs of Staff:



WALTER L. SHARP
Lieutenant General, USA
Director, Joint Staff

Intentionally Blank

**SUMMARY OF CHANGES
REVISION OF JOINT PUBLICATION 3-15
DATED 24 FEBRUARY 1999**

- **Greatly expands coverage of improvised explosive devices, mines, and other unexploded explosive ordnance**
- **Discusses the role of obstacles in joint operations**
- **Relates employment and counter employment of obstacles to all six of the joint functions**
- **Provides an obstacle framework**
- **Updates the discussion of the legal considerations surrounding the employment of obstacles**
- **Expands the coverage of authorities and responsibilities for obstacle employment**
- **Updates the discussion of planning to include the joint operation planning process**
- **Reorganizes the material to cover land and maritime operations as separate chapters**
- **Discusses mobility and countermobility considerations in land operations**
- **Adds appendices that cover land mobility capabilities and land countermobility capabilities**
- **Adds appendices that cover maritime mining capabilities and maritime mine countermeasure capabilities**
- **Adds an appendix that addresses humanitarian mine action**
- **Adds an appendix that addresses improvised explosive device defeat**
- **Modifies the definitions of the terms “barrier,” “denial measure,” “mine,” and “obstacle”**
- **Adds the terms “explosive hazard,” “humanitarian mine action,” and “obstacle intelligence”**
- **Removes the term “countermining”**

Intentionally Blank

TABLE OF CONTENTS

	PAGE
EXECUTIVE SUMMARY	vii
CHAPTER I	
INTRODUCTION	
• Introduction	I-1
• Operational Framework	I-1
• The Threat	I-5
• Legal Considerations	I-6
CHAPTER II	
JOINT PLANNING CONSIDERATIONS	
• Authorities and Responsibilities	II-1
• General Considerations	II-2
• Planning Sequence	II-8
• Planning Support	II-11
CHAPTER III	
LAND OPERATIONS	
• General Discussion	III-1
• Mobility Considerations	III-2
• Countermobility Considerations	III-6
• Command and Control	III-13
CHAPTER IV	
MARITIME OPERATIONS	
• General Discussion	IV-1
• Mining	IV-3
• Service Considerations	IV-4
• Mine Countermeasures	IV-5
• Control Measures and Reporting	IV-14
APPENDIX	
A Reporting	A-1
B Land Mobility Capabilities	B-1
C Land Countermobility Capabilities	C-1
D Maritime Mining Capabilities	D-1

E	Maritime Mine Countermeasure Capabilities	E-1
F	Humanitarian Mine Action	F-1
G	Improvised Explosive Devices Defeat	G-1
H	References	H-1
J	Administrative Instructions	J-1

GLOSSARY

Part I	Abbreviations and Acronyms	GL-1
Part II	Terms and Definitions	GL-5

FIGURE

I-1	Types of Obstacles	I-4
I-2	The Hague Convention (VIII) Provisions	I-7
II-1	Planning Considerations	II-4
II-2	The Joint Operation Planning Process	II-9
II-3	Intelligence Support Tasks	II-12
III-1	Breaching Fundamentals	III-3
III-2	Breaching Considerations	III-4
IV-1	Environmental Considerations in Mine Countermeasures	IV-2
IV-2	Maritime Mine Countermeasures	IV-6
IV-3	Maritime Mine Countermeasure Mission Objectives	IV-9
D-1	Mine Types by Depth of Water	D-4
G-1	Enemy Improvised Explosive Device Infrastructure	G-2
G-2	Improvised Explosive Device Defeat Framework	G-4
G-3	The Improvised Explosive Device Defeat System	G-8
G-4	Joint Task Force Specialized Improvised Explosive Device Defeat Cells	G-10
G-5	Notional Joint Task Force Operations Directorate Organization	G-13

EXECUTIVE SUMMARY COMMANDER'S OVERVIEW

- **Provides General Background on Barriers, Obstacles, and Mines**
 - **Explains Mine Warfare Planning Considerations**
 - **Describes Land Operations with Respect to Barriers, Obstacles, and Mines**
 - **Discusses Maritime Mine Warfare Operations**
-

Introduction

In many types of operations, joint forces can employ obstacles as a significant force multiplier.

Joint forces should be prepared to encounter obstacles (including improvised explosive devices, mines, and other unexploded explosive ordnance) and to conduct offensive mine warfare (MIW), mining, or mine laying on land and sea across the range of military operations.

Joint forces must assure their mobility, conserve their fighting potential, and protect their ability to provide personnel, logistics, and other support. They do this by predicting and preventing enemy use of obstacles, detecting their existence, avoiding them, neutralizing them, and protecting against their effects.

Assured mobility.

Assured mobility is the framework of processes, actions, and capabilities that assure the ability of the joint force to deploy and maneuver where and when desired, without interruption or delay, to achieve the mission. Assured mobility emphasizes proactive mobility and countermobility (and supporting survivability) actions and integrates all of the engineer functions in accomplishing this. Assured mobility should not be confused with the limited application of the mobility function. The fundamentals of assured mobility are predict, detect, prevent, avoid, neutralize, and protect.

The threat.

Joint forces encounter obstacles in two domains, land and maritime. However, obstacle warfare can impact, and be impacted by, operations in other domains.

Legal considerations.

The use of some obstacles, especially mines, is governed by numerous international laws, US laws, and US policies. The United States regards mines as lawful weapons when employed in accordance with accepted legal standards. US policy also

governs some demining operations. In conducting mining operations, joint forces use rules of engagement (ROE) to ensure their actions are consistent with such laws and policies. These laws and policies occasionally change and are complex, so it is critical that joint forces carefully consider them when developing ROE and that staff judge advocates review them for legal sufficiency. All commanders and staff involved with MIW should be familiar with the specific ROE concerning mines.

Joint Planning Considerations

Authorities and responsibilities.

The authority to employ mines originates with the President. The President and the Secretary of Defense (SecDef) approve ROE and promulgate policy and guidance concerning the employment of mines and humanitarian mine actions. The Secretary of State and ambassadors obtain permission from host nations for employment of mines within their territories or waters. The Chairman of the Joint Chiefs of Staff issues standing ROE and transmits policy and guidance concerning the employment of mines and humanitarian mine actions from the President and SecDef to the combatant commanders.

Levels of employment.

At the strategic level, before hostilities, barriers, obstacles, and minefields can be used as flexible deterrent options to enhance deterrence without posing an offensive threat. Pre-hostility employment would be as directed by the President. Presidential determination would be based, in part, on the political signals sent and on concurrence by affected friendly nations.

At the operational level, their primary use is the restriction of enemy maneuver options or the creation of friendly maneuver options. Operational barriers and obstacles may be created by the composite effect of many closely coordinated tactical obstacles or by the reinforcement of natural obstacles to form large terrain or massive obstacles.

Employment at the tactical level is normally done to achieve tactical offensive or defensive objectives to include enhancement of friendly direct/indirect fires, delay/destroy enemy formations, or as an economy of force technique.

Placement considerations.

Barriers, obstacles, and minefields are usually formed around or tied into an existing terrain feature or formed around a man-made

structure. Because of their size and the pattern of placement, they virtually dictate the maneuver options of both friendly and enemy forces moreover, they serve to fix as opposing maneuver elements within a “target window,” thus increasing lethality of supporting arms. Joint forces can attain and enhance surprise through the use of rapid employment means such as air- or artillery-delivered scatterable or sea mines that permit rapid mining anywhere in the operational area. Surprise can be further gained through the use of lanes and gaps, phony minefields and obstacles, and self-destructing or self-deactivating mines.

In the offense, the purpose of barrier, obstacle, and minefield employment (to include air-delivered scatterable mines) is to canalize or delay the enemy’s movements and enhance and protect the friendly force’s ability to maneuver.

In the defense, the purpose of barrier, obstacle, and minefield emplacement is directed toward degrading the enemy’s ability to maneuver, defeating the enemy attack and regaining initiative, gaining time, concentrating forces elsewhere, controlling terrain, and exhausting the enemy prior to assuming the offensive.

Planning sequence.

The joint operation planning process (JOPP) underpins planning at all levels and for missions across the full range of military operations. Planning barrier operations follows the seven steps of JOPP beginning with initiation; proceeding through mission analysis; course of action development, analysis and wargaming, comparison, and approval; and ending with the plan or order development.

Land Operations

Barriers, obstacles, and land mines continue to be a condition in the environment in which land operations are conducted. Planning for and conducting land operations must minimize the impact from obstacles or synchronize the employment of obstacles.

Mobility considerations.

Mobility operations include five functional areas, three of which are designed directly to meet challenges from barriers, obstacles, land mines, and other explosive hazards. These three are breaching operations, clearing operations, and gap crossing operations. The goal of breaching operations is the continued, uninterrupted momentum of ground forces to the objective; therefore, these

operations should be planned and executed in support of the ground forces' needs to ensure that actions at the objective are supported by actions at the breach. Clearing operations are conducted to completely eliminate obstacles, whether along a route or in a specified area. Clearing operations will not generally be conducted under enemy observation and fire. As with all mobility operations, an intensive reconnaissance effort is imperative to clearing operations. Gap crossing operations are conducted to project combat power over linear obstacles or gaps. Combat engineers conduct gap crossings in support of combat maneuver using tactical bridging equipment to span smaller gaps, heavy equipment to modify the gap, or through the use of expedient bridging.

Countermobility considerations.

Barriers, obstacles, and mines are also employed to counter the enemy's freedom of maneuver. Land mines, both conventional (or persistent) and scatterable (or nonpersistent), provide antitank and antipersonnel capabilities. **Conventional mines** are laid by hand or mechanical means, buried or surface laid, and normally emplaced in a pattern to aid in recording. The emplacement of conventional minefields is normally time-, manpower-, and logistics-intensive. **Scatterable mines** are emplaced by ground mine dispensing systems, artillery, aircraft, or by hand, making it possible to emplace minefields quickly and, importantly, to do so deep in the enemy's rear area such as at an air base, lines of communications, air defense site, or an assembly area. **Demolition** (obstacles are created by detonation of explosives) is generally used to create tactical level obstacles. However, it can also be used to create operational obstacles such as the destruction of major dams, bridges, and railways as well as highways through built-up areas or terrain chokepoints. **Constructed obstacles** are created without the use of explosives (examples are barbed wire obstacles and tank ditches). **Field expedient obstacles** (abatis or flame explosive) can provide a quick, effective means for providing a limited offensive and defensive obstacle capability when conventional resources are not available.

In the offense the joint force commander, through the joint force staff, identifies priority locations and plans and coordinates the joint emplacement of barriers, obstacles, and minefields. These barriers, obstacles, and minefields generally focus on isolating the battlefield, facilitating economy of force, enhancing overall force security, and blocking or delaying an enemy's withdrawal. The primary intent of defensive barrier, obstacle, and mine warfare employment is to degrade

enemy capabilities by disrupting combat formations and delaying their movement, interfering with command and control, and confusing enemy commanders.

Maritime Operations

Sea mines and mine countermeasures have played a significant role in every major armed conflict involving the United States, since the Revolutionary War.

More than 50 of the world's navies have minelaying capability while a considerable number of countries, many of which are known mine exporters, actively engage in development and manufacture of new models. Thus, this weapon system has an extremely favorable investment return (cost of munitions vs. extent of damage ratio). In no other phase of warfare do environmental considerations in both tactics and planning play a more dominant role than in MIW. Minelaying missions are mainly conducted only if environmental conditions are favorable for delivery and weapon effectiveness after placement. Mines and components (cases, sensors, and target signals) are all affected in significant ways by a myriad of environmental factors.

Two distinct subdivisions of mine warfare are mining and mine countermeasures.

Mining is used to support the broad tasks of establishing and maintaining control of essential sea areas. Mining embraces all methods whereby naval mines are used to inflict damage on adversary shipping to hinder, disrupt, and deny adversary sea operations. Mines may be employed either offensively or defensively to restrict the movement of surface ships and submarines.

In the event of war, US policy will be to conduct offensive, defensive, and protective mining as necessary. The purpose is to reduce the enemy submarine and surface combatant threat by destruction and disruption of their operations, to interdict the enemy sea lines of communications (SLOCs) and designated ports in order to neutralize or destroy combatant and merchant ships, and to defend US and allied shipping.

Mine countermeasures (MCM) includes all actions undertaken to prevent enemy mines from altering friendly forces' maritime plans, operations, or maneuver. MCM reduces the threat and effects of enemy-laid sea mines on friendly naval force and seaborne logistic force access to and transit of selected waterways. MCM operations are divided into two broad areas: offensive and defensive.

Planning considerations.

The MCM planning process starts with an estimate of the situation and a mission statement that results ultimately in production of an MCM tasking order. The mission statement includes an objective for active MCM, an acceptable risk factor, and a specific operational area. The choice of objectives are: exploratory (to determine whether or not mines are present); reconnaissance (to make a rapid assessment of mined area limits, types of mines, and numbers); breakthrough (to open channels and staging areas for amphibious operation or break-in and/or break-out of a port); attrition (make continuous or frequent efforts to keep the threat of mines to ship traffic low); or clearing (to attempt to remove all mines from assigned areas).

Operational considerations.

When an enemy minefield is encountered, a number of decisions must be made. If the minefield is not on a primary SLOC or operational route, the best action may be to warn and divert shipping around the area. If the minefield is in an essential area, the decision must be made as to what type of MCM to employ.

Control measures and reporting.

The mine countermeasures operations (MCMOPS) report is used to exchange MCM tactical information between all components and joint headquarters. It provides the location and status of Service component MCMOPS, including breaching and clearing. It is also used to request, task, plan, report, modify, and approve MCMOPS, as appropriate. The structured operational general (OPGEN) message provides broad general guidance for operating forces. The standing United States Navy-wide OPGEN is intended to be supplemented by numbered fleet commanders regarding mission and area of operations specifics, including issuance of fleet-level OPGEN/operation task (OPTASK) addressing unique theater characteristics, command relationships, and operational-tactical direction. It provides policy for the commanders of naval forces operating within naval, joint, or combined organizations. The OPTASK series of structured messages provide functional warfare area specific policy and guidance. The mine countermeasure report (MCMREP) is used by individual MCM organizations or a commander, task unit to report results of MCM operations. MCMREPs are normally required upon the detection of the first mine of a differing type, at the completion of each ordered task, and/or at a specified time each day.

CONCLUSION

This publication provides doctrinal guidance for planning and executing barrier, obstacle, and mine warfare for joint operations as they relate to strategic, operational, and tactical mobility and countermobility across the range of military operations.

Intentionally Blank

CHAPTER I

INTRODUCTION

“Everything that is shot or thrown at you or dropped on you in war is most unpleasant but of all horrible devices, the most terrifying. . . is the land mine.”

Sir William Slim, *Unofficial History*, 1959

1. Introduction

a. Joint forces should be prepared to encounter obstacles (including improvised explosive devices [IEDs], mines, and other unexploded explosive ordnance [UXO]) and to conduct offensive mine warfare (MIW), mining, or mine laying on land and sea across the range of military operations. In many types of operations, joint forces can employ obstacles as a significant force multiplier.

b. The employment and counter employment of obstacles is different on land than it is at sea. For example, joint forces use engineers to employ and counter obstacles on land. This is not the case for obstacles at sea. This chapter establishes the basic framework and context for the employment and counter employment of obstacles. Considerations that are unique to the land and maritime domains are covered in Chapter III, “Land Operations” and Chapter IV, “Maritime Operations.”

2. Operational Framework

a. The Role of Obstacles in Joint Operations

(1) Throughout the **range of military operations**, joint forces may encounter, or be required to employ obstacles of any type. In any type of offensive or defensive operation, obstacles can help joint forces to protect personnel, equipment, and facilities. Joint forces conducting **military engagement, security cooperation, and deterrence** activities sometimes use obstacles to enhance deterrence and demonstrate resolve. (In some cases, though, the use of obstacles constitutes an act of war.) In operations such as humanitarian and civic assistance, the very purpose of the operation might be focused on the reduction or elimination of obstacles. Such obstacles may have been emplaced years prior to the operation or by someone other than a current adversary. In **major operations and campaigns**, and some **crisis response and limited contingency operations**, joint forces will be involved in armed conflict. They use obstacles offensively and defensively to attack the mobility of adversaries, enhance the effects of friendly fires, deny adversaries the use of terrain, disrupt sustainment operations, and inflict damage to (and casualties upon) enemy forces.

(2) The employment and counter employment of obstacles impacts (or is impacted by) all six of the **joint functions**. The **command and control (C2)** of obstacle employment is critical to ensure that obstacles support the concept of operations (CONOPS), do not violate law or policy, and avoid unintended consequences. Obstacles are a part of the operational environment that can have significant impacts on joint forces. **Intelligence** must provide joint forces with as much understanding as possible about obstacles—and about adversaries’ capabilities to employ them. Joint forces can use obstacles

to enhance the effectiveness of **fires** by increasing target acquisition time, creating target-rich environments, and creating vulnerabilities to exploit. Obstacles can also degrade the ability of friendly forces to employ fires by limiting or denying access to areas needed to launch and recover aircraft or from which other weapon systems can employ fires. Obstacles can significantly inhibit the **movement and maneuver** of joint forces and threaten their fighting potential and **sustainment**. Joint forces must assure their mobility, conserve their fighting potential, and protect their ability to provide personnel, logistics, and other support. They do this by predicting and preventing enemy use of obstacles, detecting their existence, avoiding them, neutralizing them, and protecting against their effects. Joint forces can use obstacles to delay, channel, or stop the movement and maneuver of adversaries or for **protection** against an enemy's assault or against unauthorized access to facilities and bases.

(3) While the employment of obstacles can have significant advantages for joint forces, there are also multiple **disadvantages** to their employment.

(a) The creation and removal of obstacles is often manpower intensive, hazardous, and can consume a significant amount of time, materiel, equipment, and transportation resources.

(b) Obstacles must be protected to prevent adversaries from bypassing, breaching, or clearing them.

(c) To achieve certain objectives (i.e., turn, fix, block, and disrupt), obstacles require surveillance and dedicated fires.

(d) Obstacles are just as hazardous to friendly forces and noncombatants as they are to adversaries. Explosive obstacles must be rendered safe following their operational usefulness.

(e) Obstacles inhibit the mobility of both enemy and friendly forces.

b. **Assured Mobility.** Assured mobility is the framework of processes, actions, and capabilities that assure the ability of the joint force to deploy and maneuver where and when desired, without interruption or delay, to achieve the mission. This construct is one means of enabling a joint force to achieve the commander's intent. Assured mobility emphasizes proactive mobility and countermobility (and supporting survivability) actions and integrates all of the engineer functions in accomplishing this. Assured mobility should not be confused with the limited application of the mobility function. While focused primarily on the joint function of movement and maneuver it has linkages to each of the joint functions and both enables and is enabled by those functions. While the engineer has the primary staff role in assured mobility, other staff members support its integration and have critical roles to play. Ultimately assured mobility is the commander's responsibility. The fundamentals of assured mobility are:

(1) **Predict.** Engineers and planners must accurately predict potential enemy impediments to joint force mobility by analyzing the enemy's tactics, techniques, procedures, capability, and evolution. Prediction requires a constantly updated understanding of the operational environment.

(2) **Detect.** Using intelligence, surveillance, and reconnaissance (ISR) assets, engineers and planners identify the location of natural and man-made obstacles, preparations to create/emplace obstacles, and potential means for obstacle creation. They identify both actual and potential obstacles and propose solutions and alternate courses of action (COAs) to minimize or eliminate their potential impact.

(3) **Prevent.** Engineers and other planners apply this fundamental by denying the enemy's ability to influence mobility. This is accomplished by forces acting proactively before the obstacles are emplaced or activated. This may include aggressive action to destroy enemy assets/capabilities before they can be used to create obstacles.

(4) **Avoid.** If prevention fails, the commander will maneuver forces to avoid impediments to mobility, if this is viable within the scheme of maneuver.

(5) **Neutralize.** Engineers and other planners plan to neutralize, reduce, or overcome obstacles/impediments as soon as possible to allow unrestricted movement of forces. The breaching tenets and fundamentals apply to the fundamental of "neutralize."

(6) **Protect.** Engineers and other elements plan and implement survivability and other protection measures that will deny the enemy the ability to inflict damage as joint forces maneuver. This may include countermobility missions to deny the enemy maneuver and provide protection to friendly maneuvering forces.

c. **Obstacle Framework.** Obstacles can be either natural or man-made (or a combination of both), as shown in Figure I-1.

(1) **Natural obstacles** are terrain features, such as rivers, forests, or mountains.

(2) **Man-made obstacles** can be explosive or nonexplosive.

(a) **Nonexplosive obstacles** do not contain explosives (although explosives may be detonated to create the obstacle). They include:

1. **Cultural obstacles** are man-made terrain features that were not created for the purpose of obstructing military forces. Examples include towns, canals, or railroad embankments.

2. **Constructed obstacles** are created without the use of explosives. Examples include wire obstacles and antitank (AT) ditches.

3. **Demolition obstacles** are created by the detonation of explosives. Examples include bridge demolition, road craters, and abatis.

(b) **Explosive obstacles** contain explosives and include **mines, IEDs, UXO**, and other explosive hazards. See Appendix G, "Improvised Explosive Device Defeat," for further

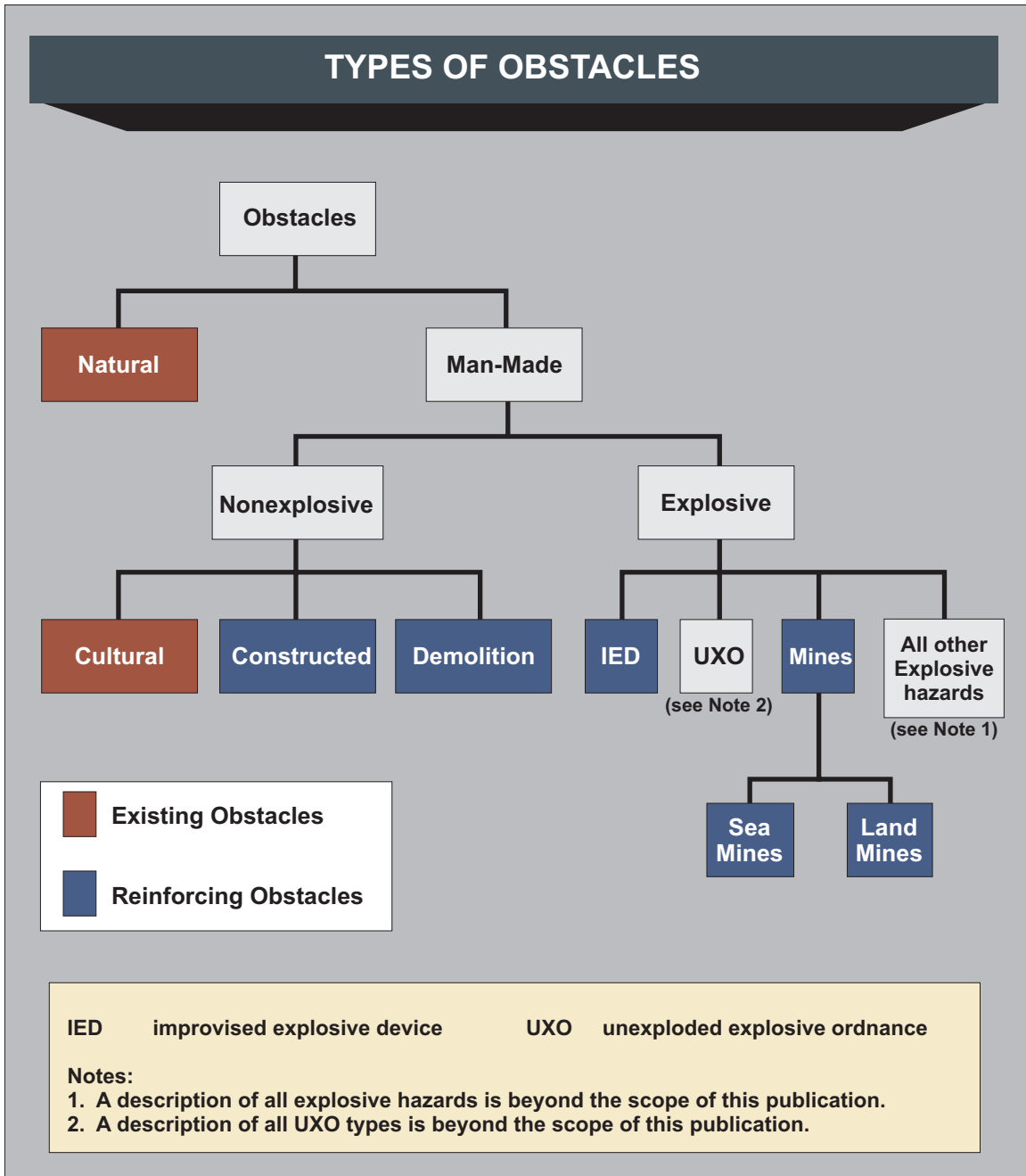


Figure I-1. Types of Obstacles

discussion of IEDs.

(3) Some obstacles are present as inherent aspects of the terrain and are called **existing obstacles**. Natural and cultural obstacles comprise this category.

(4) Obstacles that are specifically created as obstacles are sometimes called **reinforcing obstacles**. This category includes constructed obstacles, demolition obstacles, IEDs, and mines.

3. The Threat

Joint forces encounter obstacles in two domains: land and maritime. However, obstacle warfare can impact, and be impacted by, operations in other domains.

a. **Land.** Joint forces may encounter obstacles on land across the range of military operations. This is especially true in areas with highly restrictive terrain such as mountains, jungles, or urban areas. Joint forces may face adversaries with highly mobile conventional forces supported by lethal air and ground fires. Enemy surveillance capabilities may determine the effectiveness of employing friendly obstacles. The timing and methods of emplacement may be determined by the air situation. Adversaries may make extensive use of obstacles, including mines and IEDs, and a variety of countermeasures to defeat friendly obstacles. Joint forces may encounter both modern and technologically obsolete mines. The relatively low cost of mines and IEDs, and their worldwide availability makes them an ideal weapon for all nations and for anyone with access to them. In addition, enemy use of nuclear munitions and chemical mines should not be ruled out. The threat of terrorist employment of mines, explosives, and booby traps may necessitate defensive measures to reduce the vulnerability of United States (US) personnel, equipment, and facilities.



US forces must be prepared to encounter minefields throughout the range of military operations.

b. **Maritime.** Enemy mine laying operations may be conducted against friendly ports, harbors, and sea lines of communications (SLOCs). Mines may also be used in other areas vital to US and multinational maritime forces such as amphibious objective, fire support, and carrier strike group (SG) operating areas. The application of technology by industrially advanced countries has produced a sophisticated, effective form of maritime MIW. Nevertheless, older mine technologies remain effective. The ease of laying mines by ship, aircraft, or submarine presents a valid threat to a commander who must rely on naval support or on seaborne reinforcement and resupply. Maritime power projection and resupply forces originate from friendly ports. During amphibious operations, assault and assault follow-on shipping must transit narrows and operate in shallow waters. The enemy can place these forces at risk, with little cost to its own forces, by laying only a few mines.

c. **Air.** Control of airspace is essential to effective surface operations. Enemy use of mines could pose a major threat to the ability to conduct effective air operations. The enemy might employ sea mines

in an area where aircraft carriers would need to operate to be within effective range of the enemy. The enemy might also employ scatterable mines, along with munitions that have immediate effects, in attacks against friendly air bases ashore. Scatterable mines could seriously disrupt and delay air base launch and recovery operations, disrupt logistic sustainment operations to the air base, and thereby limit friendly air operations. The use of anti-helicopter mines can also limit friendly (or enemy) air operations.

4. Legal Considerations

The use of some obstacles, especially mines, is governed by numerous international laws, US laws, and US policies. The United States regards mines as lawful weapons when employed in accordance with accepted legal standards. US policy also governs some demining operations. In conducting mining operations, joint forces use rules of engagement (ROE) to ensure their actions are consistent with such laws and policies. These laws and policies occasionally change and are complex, so it is critical that joint forces carefully consider them when developing ROE and that staff judge advocates review them for legal sufficiency. All commanders and staff involved with MIW should be familiar with the specific ROE concerning mines. This section identifies the laws, agreements, and policies that are most significant to the employment and counter employment of obstacles.

a. **International Law.** International law and practice regulate the initiation and conduct of armed conflict limiting the use of certain types of weapons.

(1) The **law of armed conflict**, also called the law of war, is that part of international law that regulates the conduct of armed hostilities. It postulates four principles: **military necessity**, the **avoidance of unnecessary suffering**, **proportionality**, and **discrimination or distinction**.

(2) **The Hague Conventions.** Commencing in 1899, signatories to the various Hague Conventions sought agreements providing, among others things, regulations for the commencement of hostilities and conduct of belligerents and neutral powers towards each other and other nations, and outlawing the use of certain types of weapons in warfare. Hague Convention VIII of 1907 addressed contact sea mines and sought to restrict and regulate their use. The relevant provisions of Hague VIII are summarized in Figure I-2.

(3) **International Agreements.** There are two international agreements that bear indirectly on maritime MIW.

(a) The **Seabed Arms Control Treaty of 1971** prohibits placing nuclear weapons and other weapons of mass destruction (WMD) on the seabed or subsoil thereof beyond a 12-mile coastal zone. WMD other than nuclear weapons are not defined in this arms control treaty.

(b) The navigation and over flight provisions of the **1982 United Nations (UN) Law of the Sea Convention** reflect customary international law and codify the rights and duties of nations with respect to various uses of the oceans. Mine-laying operations must consider the applicability of this Convention and the rights and freedoms enjoyed by all nations.

THE HAGUE CONVENTION (VIII) PROVISIONS

The provisions of this convention forbid...

- the laying of unanchored automatic contact mines that do not become harmless within 1 hour after whoever lays them loses control over them and of anchored automatic contact mines that do not become harmless immediately upon breaking free of their mooring
- the mining of enemy waters and ports for the sole purpose of intercepting commercial shipping

Moreover, the convention requires...

- belligerents to do their utmost to render anchored automatic contact mines harmless within a limited time
- when a belligerent can no longer maintain surveillance over such mines, it must notify other governments and ship owners of minefield locations as soon as military conditions permit
- at the close of war, parties to the Convention must do their utmost to remove mines they have laid and report the position of anchored automatic contact mines they laid off the coast of another

Figure I-2. The Hague Convention (VIII) Provisions

(4) **The UN Charter** admonishes member states to refrain from the threat or use of force against the territorial integrity or political independence of any state, except in two situations: individual or collective self defense, and as authorized by the UN Security Council or other competent regional organization.

(5) **The 1980 United Nations Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to be Excessively Injurious or to Have Indiscriminate Effects**, commonly referred to as the **Convention on Conventional Weapons (CCW)**, is a law of war treaty governing the use of certain conventional weapons which may be deemed to be excessively injurious or to have indiscriminate effects. The US has fully integrated the CCW into land mine doctrine and practices. **Protocol II (as amended on 3 May 1996) of the CCW** refers to prohibitions or restrictions on the use of land mines, booby traps, and other devices. The protocol does not apply to the use of antiship mines at sea or in inland waterways. Requirements and restrictions on land mines include: requirements to mark, record, and publicize minefield locations at the conclusion of hostilities; joint operations after cessation of hostilities to remove or render ineffective mines and booby traps; requirements on the use of mines or booby traps in areas containing concentrations of civilians;

and prohibition on types of booby traps. A 1996 amendment to Protocol II applies to internal conflicts as well as conflicts between states.

(6) **The Mine Ban Treaty (Ottawa Convention) of 1997, to which the US is not a party,** bans the use, production, transfer, and stockpiling of antipersonnel land (APL) mines and came into force on 1 March 1999.

b. US Law and Policy

(1) Land Mines

(a) The primary treaty that restricts US use of mines is amended Protocol II, which amends Protocol II to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons. Amended Protocol II:

1. Expands the scope of the original Protocol to include internal armed conflicts.

2. Requires that all remotely delivered APL mines be equipped with self-destruct devices and back-up self-deactivation features (making them “smart” mines).

3. Requires that all non-remotely delivered APL not equipped with such devices (“dumb” mines) be used within controlled, marked, and monitored minefields.

4. Requires that all APL be detectable using available technology.

5. Requires that the party laying mines assume responsibility to ensure against their irresponsible or indiscriminate use.

6. Provides for means to enforce compliance.

7. Clarifies the use of the M18 Claymore “mine” when used in the tripwire mode. (Claymores used in command-detonated mode are not subject to amended Protocol II’s restrictions.) Claymores may be used in the tripwire mode without invoking the above “dumb” mine restrictions of amended Protocol II if:

a. They are not left out longer than 72 hours.

b. The Claymores are located in the immediate proximity of the military unit that emplaced them.

c. The area is monitored by military personnel to ensure civilians stay out of the area.

(b) The US Land Mine Policy addresses humanitarian land mine concerns while balancing legitimate warfighter requirements. Under this policy:

1. The policy supports continued use of self-destructing/self-deactivating antipersonnel (AP) and AT land mines. Self-destructing land mines are not the cause of humanitarian land mine concerns.

2. The US has committed to end the use of persistent (dumb) land mines of all types after the end of 2010, with exception for use for mine action/demining training and research purposes.

3. The policy directs that persistent APL will only be stockpiled for use by the US in fulfillment of our treaty obligations to the Republic of Korea and then only until the end of 2010.

4. The policy directs that persistent AT mines can only be employed outside the Republic of Korea when authorized by the President until the end of 2010.

5. The US no longer uses non-detectable land mines of any type.

(c) Although not applicable to the US, many nations, including many of our allies, have signed the Convention on the Prohibition of the Use, Stockpiling, Production, and Transfer of Antipersonnel Mines and on Their Destruction. This treaty is commonly referred to as the “Ottawa Treaty” and bans the use of APL, but does not restrict our allies in regards to use of AT mines.

For additional information on the employment of mines by US forces refer to Field Manual (FM) 3-100.38/Marine Corps Reference Publication (MCRP) 3-17.2B/Navy Tactics, Techniques, and Procedures (NTTP) 3-2.4.1/Air Force Tactics, Techniques, and Procedures (Instruction) (AFTTP[I]) 3-2.12, UXO-Multi-Service Tactics, Techniques, and Procedures for Unexploded Explosive Ordnance Operations, Navy Warfare Publication (NWP) 3-15, Naval Mine Warfare, Marine Corps Warfighting Publication (MCWP) 5-2.1, The Commander’s Handbook on the Law of Naval Operations (section 7.7 and 9.2), and FM 21-16/MCRP 3-17.2A, Unexploded (UXO) Ordnance Procedures.

(2) US Policy on Humanitarian Demining. The US Humanitarian Mine Action Program has supported and funded humanitarian demining (HDM) efforts since 1988. Because of the threat to peace and safety, HDM operations have become a significant disarmament and peace operations activity. Demining is ultimately a host nation (HN) responsibility however; the US promotes its foreign policy interests by assisting other nations in protecting their populations from land mines through mine awareness education and training of HN personnel in the surveying, marking, and clearing of mines. While providing such assistance US military forces are prohibited from engaging in the physical detection, lifting, or destroying of land mines, except in limited circumstances. See Appendix F, “Humanitarian Mine Actions,” for additional information.

Intentionally Blank

CHAPTER II

JOINT PLANNING CONSIDERATIONS

“Battles are won through the ability of men to express concrete ideas in clear and unmistakable language.”

Brigadier General S.L.A. Marshal
US Army

1. Authorities and Responsibilities

a. The President of the United States and the Secretary of Defense

(1) **Mine Release Authority. The authority to employ mines originates with the President.** Since the employment of mines in international waters or in foreign territories (including territorial seas) is generally a hostile act, the President must authorize them. Employing mines in allied territory or waters is permissible with HN permission and Presidential authorization.

(2) The President and the Secretary of Defense (SecDef):

(a) Approve ROE.

(b) Promulgate policy and guidance concerning the employment of mines and humanitarian mine actions.

b. **The Secretary of State and ambassadors** obtain permission from HN for employment of mines within their territories or waters.

c. The Chairman of the Joint Chiefs of Staff (CJCS)

(1) Issues standing ROE.

(2) Transmits policy and guidance concerning the employment of mines and humanitarian mine actions from the President and SecDef to the combatant commanders.

d. Joint Force Commanders (JFCs)

(1) Combatant Commanders

(a) Augment ROE (with approval by the President and the SecDef).

(b) Distribute ROE to subordinate and subordinate commands for compliance.

(c) Provide guidance and direction with respect to employment of barriers, obstacles, and mines.

(2) **Joint Task Force Commanders**

(a) Request supplemental ROE for MIW, as required.

(b) Provide guidance and direction with respect to employment of barriers, obstacles, and mines.

2. General Considerations

a. Barrier, Obstacle, and Mine Levels of Employment

(1) **Strategic Employment.** Before hostilities, barriers, obstacles, and minefields can be used as flexible deterrent options to enhance deterrence without posing an offensive threat. Defensive employment along a hostile land border can demonstrate friendly resolve. Maritime defensive and protective mining can help protect friendly ports and waters. Pre-hostility employment would be as directed by the President. Presidential determination would be based, in part, on the political signals sent and on concurrence by affected friendly nations. Should deterrence fail, offensive maritime mining of enemy ports and waters can constrict enemy seaborne economic war sustainment efforts and reduce enemy ability to safely deploy maritime forces. Similarly, offensive employment of air-delivered scatterable mines or sea mines can deny or restrict enemy strategic mobility and sustainability efforts.

(2) **Operational Employment.** Defensive barrier, obstacle, and minefield employment can help protect friendly ports, lines of communications (LOCs), and key facilities and free combat forces for offensive employment and denial operations. Offensive employment can protect friendly maneuver while disrupting enemy ability to concentrate or maneuver forces. Barriers and obstacles having operational significance usually differ in scale from those having tactical significance. However, size alone does not make an obstacle operationally significant. At the operational level, their primary use is the restriction of enemy maneuver options or the creation of friendly maneuver options. Major natural terrain features and a focus on the enemy provide the foundation for the development of an obstacle or barrier plan. Operational barriers and obstacles may be created by the composite effect of many closely coordinated tactical obstacles or by the reinforcement of natural obstacles to form large terrain or massive obstacles. An example of a massive obstacle is the temporary flooding caused by the destruction of a major dam on a river. This, however, is only temporary in nature. Mines can also contribute to gaining air superiority. Mines can delay efforts to repair damage to air bases caused by munitions that have immediate effects, thus degrading or denying the base's capability to launch or recover aircraft. Mines can also restrict the deployment of mobile, surface-based air defenses, as well as surface-to-surface systems, because rapid movement in a mined area increases the risk of a mine encounter. Mines can also disrupt logistic sustainment operations being performed in the enemy's rear area.

(3) **Tactical Employment.** Employment at the tactical level, such as the creation or countering of barriers, obstacles, or minefields, is normally done to achieve tactical offensive or defensive objectives to include enhancement of friendly direct/indirect fires, delay/destroy enemy formations, or as an economy of force technique.

b. **Placement Considerations.** To achieve the maximum effect from an operational barrier, obstacle, or minefield, certain factors must be considered.

(1) Barriers, obstacles, and minefields are usually formed around or tied into an existing terrain feature (e.g., mountain chain or a strait) or formed around a man-made structure (e.g., air base, canal, highway, or bridge). Although there is little flexibility in positioning these large-scale obstructions, flexibility exists in selecting and designating those features that will be enhanced or reinforced. Operational barriers, obstacles, and minefields are placed to manipulate the enemy in such a way that supports the commander's intent and scheme of maneuver and should be observed or covered by fire.

(2) The effects that these operational barriers, obstacles, and minefields will have on both the friendly and enemy forces' ability to maneuver on land and sea or to conduct effective air operations must be analyzed. Operational barriers, obstacles, and minefields do more than just degrade the maneuver of enemy forces. Because of their size and the pattern of placement, they virtually dictate the maneuver options of both friendly and enemy forces; moreover, they serve to fix opposing maneuver elements within a "target window," thus increasing lethality of supporting arms.

(3) The element of surprise is achieved in a different manner through the employment of operational barriers, obstacles, and minefields. Because of their operational significance, both friendly and enemy forces usually know of their existence and location. Surprise can result when a barrier, obstacle, or minefield perceived by one force as significant fails to effectively obstruct their opponent. This implies that the operational significance of a barrier, obstacle, or minefield depends both on its physical obstruction capability and the way in which the opposing forces perceive it. Joint forces can attain and enhance surprise through the use of rapid employment means such as air- or artillery-delivered scatterable or sea mines that permit rapid mining anywhere in the operational area. These can confront the attacker with a completely new situation almost instantly. The use of hard-to-detect employment means such as submarines is another way to achieve surprise. Surprise can be further gained through the use of lanes and gaps, phony minefields and obstacles, and self-destructing or self-deactivating mines. Friendly forces should avoid readily discernible or repetitive employment and utilize deceptive measures. By varying the type, location, and design, the enemy's understanding and breaching of friendly barriers, obstacles, and minefields is made more difficult.

c. **Offensive.** In the offense, the purpose of barrier, obstacle, and minefield employment (to include air-delivered scatterable mines) is to canalize or delay the enemy's movements and enhance and protect the friendly force's ability to maneuver. This is achieved by controlling or influencing the movement of enemy ground and naval forces and degrading the operability of enemy air bases. The enemy's ability to counterattack or reinforce is restricted and the operational area is isolated. Barriers, obstacles, and mines have five main objectives in offensive operations (see Figure II-1).

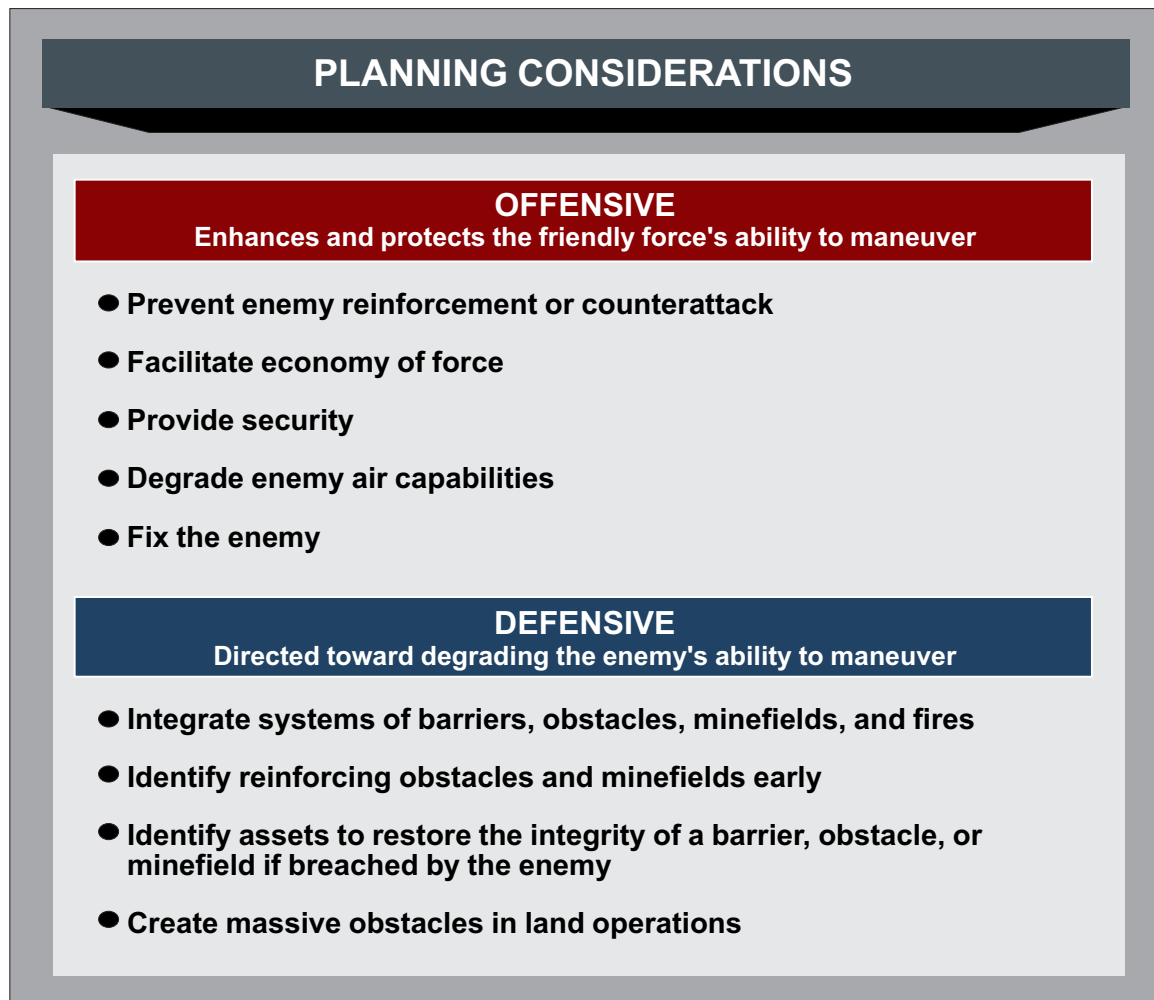


Figure II-1. Planning Considerations

(1) **Prevent Enemy Reinforcement or Counterattack.** To prevent the enemy from reinforcing or counterattacking, critical routes are interdicted to hinder movement of reserves and logistics. Speed and depth are vital.

(2) **Facilitate Economy of Force.** Barriers, obstacles, and minefields allow fewer forces to defend selected sectors, allowing relieved maneuver units and other combat resources to be concentrated in other zones for attack. Similarly, they become a combat multiplier, amplifying the firepower effectiveness of the friendly forces defending them by creating optimum fields of fire. Easily defended chokepoints can be effectively reinforced with obstacles, supported by on-call fire support, and held by relatively small forces.

(3) **Provide Security.** Barriers, obstacles, and minefields can be used in critical areas along the flanks of advancing forces to restrict enemy attacks. At the operational level, river systems, mountain ranges, deserts, and snow- or ice-covered areas are natural barriers and obstacles that can enhance flank security. Shallows, reefs, and other maritime hazards can be used at sea. Existing barriers and obstacles can be strengthened with reinforcing obstacles and minefields to counter an enemy threat.

(4) **Degrade Enemy Air Capability.** Mines can pose a significant obstacle to the enemy's ability to recover and resume operations after an air base attack. Any delays can provide friendly forces with an important opportunity to further suppress the enemy's ability to defend against follow-on attacks, leading to the enemy's loss of control of the air.

(5) **Fix the Enemy.** Air- and artillery-delivered scatterable mines and emplaced mines can disrupt and delay the enemy's retreat during pursuit and exploitation. They can also be used to disrupt the commitment of the enemy's reserve and follow-on forces.

d. **Defensive.** In the defense, the purpose of barrier, obstacle, and minefield emplacement is directed toward degrading the enemy's ability to maneuver, defeating the enemy attack and regaining initiative, gaining time, concentrating forces elsewhere, controlling terrain, and exhausting the enemy prior to assuming the offensive. A secondary objective is to destroy or attrite the enemy force. Other objectives include the support of economy of force measures and the retention of key terrain or areas of significant political, strategic, operational, or tactical value. Barriers, obstacles, and mines have four main objectives in defensive operations (see Figure II-1).

(1) **Integrate Systems.** Defensive reinforcement is achieved by integrating systems of barriers, obstacles, minefields, and fires. The objective is to degrade enemy movement, assist counterattacks, and facilitate future friendly offensive operations.

(2) **Identify Obstacles and Minefields.** Reinforcing obstacles and minefields are identified as early as possible, because the development of a barrier, obstacle, or minefield



A main priority in defense is the degradation of enemy ability to maneuver.

system in depth requires time, the commitment of engineer or specialized resources, extensive logistic support, or other forces such as over watching maneuver elements.

(3) **Identify Assets.** Plans include the identification of assets to restore the integrity of a barrier, obstacle, or minefield if breached by the enemy. This is especially important if the obstruction is critical to operational success.

(4) **Create Massive Obstacles.** In operations involving land forces, massive obstacle creation should be considered in situations where friendly forces control a major dam on a river. Control of the dam provides the option of limited, controlled flooding or destruction of the dam to create both a destructive flood surge and flooded areas. The same might be applied to the destruction of large bridges that cross substantial watercourses or other large gaps. However, the effect on friendly maneuver and future operations should be evaluated.

e. **Scatterable Mines.** The employment of scatterable mines requires close coordination between components during both the planning and employment phases of the operation. The coordination for the employment of scatterable mines is a combined effort of the joint targeting coordination board (JTCB), the joint force engineer, and the joint force air component commander (JFACC). The JFACC is responsible for planning and delivery of air-delivered scatterable mines. The planning and integration of minefields into the barrier plan is the responsibility of the joint force engineer. The JTCB is responsible for facilitating joint forces targeting operations by establishing a forum to ensure support and synchronization of JFC objectives as well as integrating and deconflicting all joint force component operations. To ensure a coordinated effort, a general CONOPS is developed that includes such issues as identification of objectives, timing, minefield placement, and ingress or egress routes. Coordination is essential if mines are deployed where friendly ground, special operations forces (SOF), or personnel recovery forces may be operating or in locations that lie within the ground force's boundaries. Once emplaced, the mines remain active until detonated or until the mines self-destruct or self-disarm after a preset period of time. Required self-destruct or self-disarm times depend upon the operational or tactical situation and are not necessarily related to the proximity of friendly forces. US scatterable mines are all designed to self-destruct. Scatterable mines are selected when they are the optimum means available to support the JFC's CONOPS.

(1) Employing scatterable mines requires prior coordination with and approval from the commander within whose boundaries the mines are employed. Specific coordination procedures should provide an optimum balance between requirements for control and flexibility in execution. In areas close to friendly forces or where friendly forces may operate before the mines self-destruct, detailed coordination is essential. Upon approval, the location of employment will be reported by the employing force to the appropriate ground force commander.

(2) Scatterable mines are most effective when combined with other weapons to delay, disrupt, destroy, or turn enemy forces. They can complement organic capabilities. For example, scatterable mines can be used to secure flanks of ground units, close breaches in minefields and obstacles, or protect an amphibious objective area (AOA).

(3) In early stages of contingency operations or at extended ranges, air-deliverable scatterable mines may be the only available mining capability.

(4) Minefields employed in direct support of ground forces have limited effectiveness if unobserved and not covered by some means of fire or fire support.

(5) If scatterable mines are the only type of ordnance that will satisfy the ground force commander's requirements, their use should be specified in the ground force commander's request. Similarly, if employment of scatterable mines in a specified area is not acceptable (i.e., likely to create an undesired effect) this should also be specified in the ground force plan.

f. **Denial Considerations.** A denial measure is an action to hinder or deny the enemy the use of territory, personnel, or facilities. It may include destruction, removal, contamination, or erection of obstructions.

(1) The combatant commander establishes the theater policies governing denial operations in coordination with allied or friendly governments. Detailed planning and execution are subsequently delegated to subordinate commanders. In developing denial policies, consideration must be given to those facilities and areas required to support life in the post-hostility period regardless of the outcome of the conflict. The long-range social, economic, political, and psychological effects of destruction of civil properties and material must be weighed against the military advantages achieved. The law of war requires that denial operations be directed toward the enemy's forces and not used to cause purposeless, unnecessary human misery and physical destruction.

(2) Denial operations usually do not focus upon immediate enemy destruction, but rather on contributing to future friendly operations. Denial operations may have a major impact on the civilian population. Denial targets frequently involve civil facilities and structures, such as electrical power generation facilities and ports, and require careful judgment regarding the military importance versus the impact on the civilian population.

g. **Deception.** Deception is defined as those measures designed to mislead the enemy by manipulation, distortion, or falsification of evidence to induce the enemy to react in a manner prejudicial to enemy interests. There are two basic approaches to deception. The first is to increase uncertainty in order to forestall the enemy's timely reaction. The second is to misdirect the enemy toward a line of action that favors friendly operations. Barriers, obstacles, and minefields can support the aims of both approaches. Time and enemy surveillance techniques will determine the best method of employing barriers, obstacles, and minefields in support of deception. Allowing the enemy to observe units or vessels engaged or preparing to engage in seemingly realistic employment or breaching operations transmits a specific message to the enemy. Operations must be planned so that their execution will not inadvertently reveal friendly plans. The employment of phony obstacles and minefields are deception techniques. Allowing the enemy access to manipulated or distorted friendly operation plans (OPLANs) that support observations of friendly activity may significantly enhance the believability of the deception.

h. **Political and Psychological.** The primary objective of employing barriers, obstacles, and minefields may be deterrence rather than physical destruction. Accordingly, political and psychological considerations are key aspects that have far-reaching implications. From a political perspective, such measures will signal friendly resolve to take actions required to protect national interests. Psychological deterrence is also achieved. Although the degree of psychological deterrence cannot be quantified, the mere suspicion that mines have been laid can adversely affect enemy planning and operations in excess of the actual threat. The psychological impact of mines can be increased by news-media exposure of their existence and lack of a ready capability to implement countermeasures. These considerations should be included in the development of the information operations (IO) portion of the joint operation.

3. Planning Sequence

The joint operation planning process (JOPP) underpins planning at all levels and for missions across the full range of military operations. It applies to both supported and supporting JFCs and to joint force component commands when the components participate in joint planning. The primary steps of JOPP are shown in Figure II-2 and are discussed in the remainder of this section.

a. **Planning Initiation.** JOPP begins when an appropriate authority recognizes a potential for military capability to be employed in response to a potential or actual crisis. At the strategic level, that authority — the President, SecDef, or the CJCS — initiates COA development by deciding to develop military options. In an actual crisis, the CJCS will issue a warning order. Combatant commanders and other commanders also may initiate COA development on their own authority when they identify a planning requirement not directed by higher authority.

b. **Mission Analysis.** The joint force's mission is the task or set of tasks, together with the purpose, that clearly indicates the action to be taken and the reason for doing so. The primary products of mission analysis are a revised mission statement, the JFC's initial intent statement, initial planning guidance, and the commander's critical information requirements. The initial planning guidance includes the identification of areas or zones that require operational-level barriers, obstacles, or minefields; critical targets or enemy functions for attack; sequencing of barrier, obstacle, and minefield employment and desired effects; logistic priorities; ROE; and the employment of obstacles and minefields to support denial operations.

c. **COA Determination.** COA determination consists of four primary activities: COA development, analysis and wargaming, comparison, and approval. A good COA accomplishes the mission within the commander's guidance and positions the joint force for future operations, and provides flexibility to meet unforeseen events during execution. During COA determination, the JFC's staff initially assesses the terrain, weather, and climate to identify existing operational-level barriers, obstacles, and limits imposed by expected weather. The need for additional barriers, obstacles, and minefields is identified. Areas suitable for enhancement and reinforcement are identified. Special attention is given to identifying areas that could be reinforced to form massive area obstacles. The terrain is evaluated from both friendly and enemy perspectives. The evaluation considers the enemy's ability and willingness to cross difficult terrain. Friendly capabilities should not be assumed to be the same as enemy capabilities. Both friendly and enemy perspectives and



Figure II-2. The Joint Operation Planning Process

capabilities are evaluated to estimate options available to each side. The terrain and climate assessments during the initial stage of the plan development phase will enhance the integration of barriers, obstacles, and minefields into the overall plan. Once the COA is approved, the staff converts the COA into a CONOPS.

d. **Plan or Order Development.** Contingency planning will result in plan development, while crisis action planning will lead directly to operation order (OPORD) development. During plan or order development, the commander and staff, in collaboration with subordinate and supporting components and organizations, expand the approved COA into a detailed joint OPLAN or OPORD by first developing an executable CONOPS. The CONOPS describes how the actions of the joint force components and supporting organizations will be integrated, synchronized, and phased to accomplish the mission, including potential branches and sequels. During CONOPS development, the JFC's staff initiates the development of the formal barrier and obstacle plan. This may include the employment of reinforcing barriers, obstacles, and minefields. Emphasis is placed on maximizing the effectiveness of existing

barriers and obstacles. Each barrier and obstacle plan requires an estimate of possible or probable enemy actions to identify opportunities for offensive and defensive action. When completed, the plan should clearly delineate operational barriers, obstacles, and minefields and their intended effect and potential unintended effects on the campaign or operation.

(1) The JFC and staff must consider the various component weapons systems and delivery assets available to deliver or emplace the selected reinforcing barriers, obstacles, and minefields. The delivery or emplacement assets must be identified and allocated accordingly. The JFC is also responsible for integrating this support into the overall campaign or operation.

(2) The barrier and obstacle plan formulation should also identify areas that must remain free of obstacles or minefields to facilitate friendly maneuver. Such areas are necessary to exploit the advantages gained from enemy reactions and vulnerabilities. At the tactical level in ground operations, this is achieved through the designation of obstacle zones and belts.

(3) Although sustainment is a Service component responsibility, the JFC must consider the capabilities, vulnerabilities, and limitations of logistic systems in the planning and execution of the operation. To achieve flexibility, the JFC must anticipate current and future requirements, the potential for degradation by enemy action, and the ability to sustain operations throughout an entire operation or campaign.

(4) The barrier, obstacle, and minefield guidance contained in the OPLAN should provide for the necessary control of obstacle or minefield areas and obstacle or minefield restricted areas. It may designate critical obstacles and reserve the execution of selected obstacles. However, restrictions placed on subordinate commanders should be limited to those deemed necessary by the JFC. At a minimum, guidance should delineate any special reporting, recording, and marking responsibilities.

(5) The development of the joint campaign or OPLAN necessarily includes estimates from the component commanders as to how their assets and capabilities can best support the JFC's objectives.

e. The JFC reviews and approves the concept of employment for operational barriers, obstacles, and minefields as well as the denial plan which is designed to prevent potential aggressors from the use of certain resources, and/or to deny them access to certain areas. As part of this approval process, the JFC verifies that the CONOPS meets intent and guidance and facilitates synchronization to produce the most effective employment of operational barriers, obstacles, and mines.

f. Once formal approval of the OPLAN is obtained, subordinate and supporting commanders develop their own plans. In doing so, they can determine how existing and reinforcing barriers, obstacles, and minefields will affect maneuver, what conditions are imposed on battle plans, and how to employ supporting obstacles. Although this is addressed as a separate step, subordinate and supporting commanders develop plans concurrently with those of the JFC.

g. The barrier, obstacle, and mine warfare plan is published, if required, as an appendix of an annex to the theater campaign plan, OPLAN, or OPORD. In addition, the reporting of execution or employment of barriers, obstacles, and minefields should be addressed in OPLAN or OPORD annexes and appendixes (e.g., ROE and in unit standard operating procedure [SOP]).

h. Although employment is addressed separately in this publication, planning and employment are a continuous process. As one operation is executed, the next one is planned, coordinated, and executed. In addition, planners must closely monitor execution and be prepared to adapt the plan, and future plans, in response to changing circumstances. This may involve reappportioning and reallocating assets and reprioritizing support for barrier, obstacle, and minefield emplacement.

i. Plans for the removal or deactivation of mines, barriers, and obstacles may need to be formulated and employed during or after hostilities or other operations.

4. Planning Support

a. **Intelligence.** Planning for operations involving barrier, obstacle, and mine warfare requires timely, continuous, and reliable all-source counterintelligence and intelligence support. Figure II-3 identifies some typical intelligence support tasks. During the planning process, engineers require a variety of intelligence products to include geospatial intelligence provided by the National Geospatial-Intelligence Agency.

(1) Collection, production, and dissemination of intelligence information must start during peacetime. Tasks include identifying and evaluating worldwide mine-production facilities and storage capabilities (to include on-hand quantities). For each potential operation, analysts must evaluate types, quantities, and capabilities of mines, barriers, and obstacles available to the adversary. The evaluation includes technical information on each type of mine (characteristics, description, capability, and vulnerabilities). This information should be assembled by and disseminated to planning staffs.

(2) Joint intelligence preparation of the operational environment is a process used to identify adversary mine, barrier, and obstacle storage locations; topographic, hydrographic, and oceanographic information; actual and potential locations of adversary mine, barrier, and obstacle employment; the adversary's doctrine, tactics, techniques, and procedures (TTP) for countering and employing them; fire support to support mine, barriers, and obstacles (doctrine, capabilities, unit locations); breaching capabilities (assets, doctrine, and TTP); and current and future operational capabilities (see Joint Publication (JP) 2-01.3, *Joint Intelligence Preparation of the Operational Environment*). Intelligence should provide and update this information to the JFC and staff in time for the staff to include it in the planning process.

(3) Once conflict begins, intelligence collection (including reconnaissance and combat units) must: locate enemy barrier, mine, and obstacle locations; identify and locate enemy fire support; identify remaining enemy employment capabilities; and locate enemy breaching assets. This information,

INTELLIGENCE SUPPORT TASKS

Tasks include identifying and evaluating...

- Worldwide mine-production capabilities and facilities
- Types, quantities, and capabilities of mines, barriers, and obstacles available
- Technical information on each type of mine (characteristics, description, capability, and vulnerabilities)
- Enemy mine, barrier, and obstacle storage locations
- Topographic, hydrographic, and oceanographic information
- Actual and potential locations for enemy mine, barrier, and obstacle employment
- The enemy's doctrine, tactics, techniques, and procedures for employing mines, barriers, and obstacles
- Enemy fire support for mines, barriers, and obstacles (doctrine, capabilities, unit locations)
- Enemy breaching capabilities (assets, doctrine, and tactics, techniques, and procedures)
- The enemy's current and future operational capabilities
- Increased activity near suspected storage sites indicative of enemy intent to mine

Figure II-3. Intelligence Support Tasks

particularly any updates, must be pushed down to tactical echelons. Given known enemy doctrine, TTP, intelligence must advise the JFC as to how the enemy will react to friendly operations.

Doctrine and responsibilities for intelligence support are addressed in JP 2-0, Joint Intelligence.

b. **Logistics.** Planning for the use of barriers, obstacles, and mines involves the acquisition, storage, maintenance, distribution, and security of the materiel. Logistic planners must be included early in the planning process to ensure proper coordination and timely acquisition of the resources that will be needed to execute the plan.

(1) **Acquisition and Storage.** Anticipation is key to a sound acquisition and storage plan. Planners must ensure that the proper mix of mines and minefield, obstacle, and barrier emplacing materials and counter-obstacle equipment and materiel are made available in time to meet the demands of the OPLAN. Requirements at the operational level must be anticipated to prevent delays in delivery of the

material to a theater. Unless they are special munitions, the storage of mines will normally be handled like any other munitions.

(2) **Distribution.** The execution of this logistic function is crucial to the success of the OPLAN. It helps transform the OPLAN into tactical operations. Logistic planners must ensure the availability of sufficient resources to transport barrier or obstacle material and mines to the place of employment or deployment.

(3) **Legal Concerns.** Because the use, possession, transfers, and stockpiling of land mines is highly regulated under various international agreements, international movement and storage of mines must be fully coordinated to avoid legal and political problems.

c. **Communications.** Planning for and employment of barriers, obstacles, and mines requires communication to facilitate joint and multinational coordination and information flow to inform friendly forces (and, when necessary, civilians) of locations. These activities require that secure, interoperable communications systems are available to support the mission.

d. **Explosive Hazards Database.** The joint force should establish a single explosive hazards database for the entire operational area to facilitate a common understanding within the joint force and with multinational forces, other government agencies, intergovernmental organizations, and nongovernmental organizations. This database should include all known and suspected mines, IEDs, UXOs, and other explosive hazards and be compatible with common operational picture (COP) tools to enhance situational awareness and support situational understanding.

Intentionally Blank

CHAPTER III LAND OPERATIONS

“Gentlemen, I don’t know whether we will make history tomorrow, but we will certainly change geography.”

**Sir Herbert Plumer (To press conference
the day before the blowing up of
Messines Ridge, 6 June 1917)**

1. General Discussion

Barriers, obstacles, and land mines continue to be a condition in the environment in which land operations are conducted. The condition is significant across the range of military operations; from civil support in an area littered with hurricane debris, through stability operations in which insurgents employ explosive hazards, to offensive or defensive operations employing complex man-made and natural obstacle systems. This chapter discusses the framework for planning and conducting land operations that minimize the impact **from obstacles or synchronize the employment of obstacles.**

a. **Support to Movement and Maneuver.** Support to movement and maneuver is the integrated application of assured mobility throughout the operational area, to ensure freedom of maneuver and preserve combat power. It is the framework within which consideration of barriers, obstacles, and mine warfare occurs. Support to movement and maneuver consists of the subtasks, capabilities, and systems within the joint functions that enable both mobility and countermobility operations. The focus is on supporting the maneuver commander’s ability to gain a position of advantage in relation to the enemy; conducting mobility operations to negate the impact of enemy obstacles, conducting countermobility to impact and shape enemy maneuver, or a combination of both. Support to movement and maneuver includes more than those capabilities to employ or counter obstacles. For example, it includes the regulation of traffic in the maneuver space, the handling of displaced persons, and other capabilities to support the maneuver plan. While support to movement and maneuver provides the broader framework of enabling capabilities to support movement and maneuver, the discussion of barriers, obstacles, and mine warfare focuses specifically on mobility and countermobility (and the supporting survivability) tasks. Countermobility and supporting survivability operations are also linked to the joint function of protection since survivability is one of the subordinate tasks of that function.

b. **Engineer Functions.** The three engineer functions are combat, general, and geospatial engineering. Countering barriers, obstacles, and mines is included within **mobility operations**. The employment of barriers, obstacles, and mines is included within **countermobility operations**. At the tactical level, mobility and countermobility operations are typically supported by combat engineers as **combat engineering** tasks although selected combat engineering tasks may also be performed by general engineers. Combat engineers are specifically organized, trained, and equipped to perform these tasks in close combat in support of a combined arms force. (For further information about the engineer functions and the differences between combat and general engineers, see JP 3-34, *Joint Engineer Operations*). The remainder of this chapter discusses

those combat engineering mobility, countermobility, and supporting survivability tasks that shape or deny land operational environment by employing or countering the employment of barriers, obstacles, and land mines. General engineering may also support mobility operations at all levels of war to include selected support to tactical operations. Geospatial engineering is potentially present to support all engineer operations.

2. Mobility Considerations

a. **General.** Mobility operations include five functional areas, three of which are designed directly to meet challenges from barriers, obstacles, land mines, and other explosive hazards (EHs). These three (breaching operations, clearing operations, and gap crossing operations) are discussed further in paragraphs b through d below. The five functional areas of mobility operations for Army units and Marine air-ground task forces (MAGTFs) are covered in detail in FM 3-90.11, *Combined Arms Mobility Operations*, MCWP 3-17.3, *MAGTF Breaching Operations*, and FM 3-90.12/MCRP 3-17.1, *Combined Arms Gap Crossing Operations* and as discussed below.

(1) **Conduct Combined Arms Breaching Operations:** detect, neutralize (by combined arms breach or bypass), mark, and proof mined areas and obstacles. Combined arms breaching operations are typically performed in a close combat environment.

(2) **Conduct Clearing Operations:** employ tactics and equipment to detect and eliminate obstacles, mines, and other EHs. While this is not always part of a combined arms breaching operation and is typically not performed in a close combat environment, it will still generally include the task of breach.

(3) **Conduct Gap Crossing Operations:** fill/cross gaps in the terrain/man-made structures to allow personnel and equipment to pass.

(4) **Construct/Maintain Combat Roads and Trails:** expediently prepare or repair routes of travel for personnel and equipment. This includes temporary bypasses of damaged roads and bridges.

(5) **Perform Forward Aviation Combat Engineering:** construct/maintain forward airfields and landing zones (LZs), forward arming and refueling points, landing strips, or other aviation support sites in the forward combat area. This task also includes those actions performed in support of airfield seizure.

b. Breaching Operations

(1) Successful breaching operations are characterized by applying the **breaching tenets**. These tenets should be applied whenever an obstacle is encountered in the operational area, whether during an attack or a route clearance operation. These tenets are:

(a) **Intelligence** (includes obstacle intelligence [OBSTINTEL]).

(b) **Breaching fundamentals**
(see Figure III-1).

(c) **Breaching organization.**

(d) **Mass.**

(e) **Synchronization.**

(2) Combined arms breaching operations are some of the most complex of modern warfare but are not an end in themselves. They exist only as a part of the maneuver forces' operation that is focused on the objective. The goal of breaching operations is the continued, uninterrupted momentum of ground forces to the objective; therefore, these operations should be planned and executed in support of the ground forces' needs to ensure that actions at the objective are supported by actions at the breach. A **typical sequence** for a breaching consideration is shown in Figure III-2.

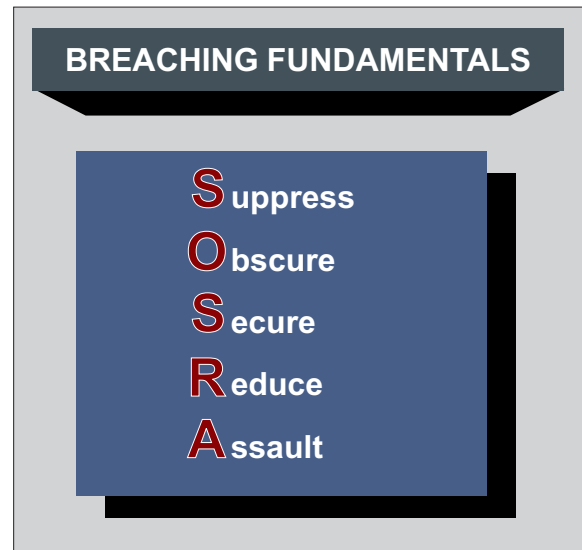


Figure III-1. Breaching Fundamentals

(3) As the combined arms team conducts planning for future operations, it may develop a COA requiring breaching operations. Enemy obstacles that disrupt, fix, turn, or block the maneuver force can affect the timing and flow of the operation. Most obstacles will be observed by the enemy and protected with fires; obstacles should be bypassed if possible. For those obstacles that must be breached, constant coordination and integration of all elements of the combined arms team are vital for success. Combat engineers provide significant capability to the combined arms operation and are focused on tactical engineer reconnaissance to include OBSTINTEL and employing techniques necessary to penetrate obstacles in the path of the force. Geospatial engineering may assist the planning of a deliberate breach. At the brigade combat team (BCT) and the regimental combat team (RCT) level, any organic combat engineer companies will typically require augmentation by additional engineer capabilities for most breaching operations. Appendix B, "Land Mobility Capabilities," provides information on those capabilities that are most likely to augment joint forces to conduct mobility operations.

(4) Breaching operations must be adapted to best exploit the situation. The breaching tenets apply across the continuum of offensive operations, with the level and type of planning distinguishing which of the three general types of breaching operations (deliberate, hasty, and covert) are used to meet the factors of mission, enemy, terrain and weather, troops and support available—time available. (METT-T).

(a) **Deliberate Breach.** A deliberate breach is used against a strong defense or complex obstacle system. It is similar to a deliberate attack, requiring detailed knowledge of both the defense and the obstacle systems. It is characterized by the most prior planning, preparation, and build-up of combat power on the near side of obstacles. Subordinate units are

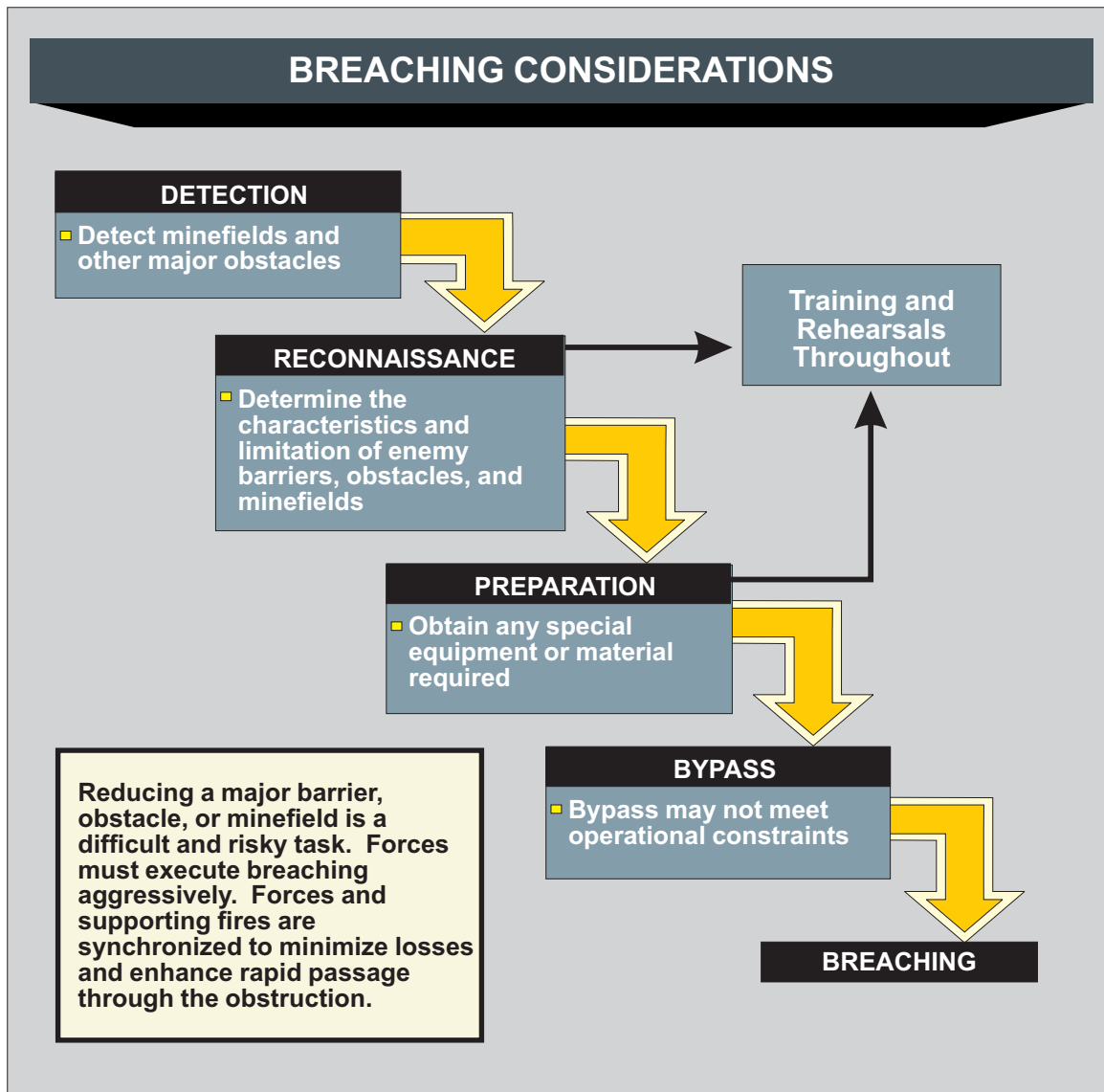


Figure III-2. Breaching Considerations

task-organized to accomplish the breach. The breach often requires securing the far side of the obstacle with an assault force before or during reduction.

(b) **Amphibious Breach.** An amphibious breach is an adaptation of the deliberate breach specifically designed to overcome antilanding defenses to conduct an amphibious assault.

(c) **Hasty Breach.** A hasty breach is an adaptation to the deliberate breach – conducted when less time is available. It may be conducted during either a deliberate or hasty attack due to lack of clarity on enemy obstacles or changing enemy situations to include the emplacement of scatterable mines (SCATMINES).

(d) **In-stride Breach.** An in-stride breach is a variant of a hasty breach that consists of a rapid breaching adaptation conducted by forces organic to (or task organized with)

the attacking force. It consists of preplanned, well-trained, and well-rehearsed breaching battle drills and the use of the unit's SOP. The in-stride breach takes advantage of surprise and momentum to penetrate obstacles. The force uses the in-stride breach against either weak defenders or very simple obstacles and executes the battle drill on the move. Attacking forces should move configured to execute an in-stride breach except when a deliberate breach is planned.

(e) **Covert Breach.** Covert breaching operations are used to secretly pass through obstacles. The covert breach uses elements of the deliberate and hasty breach as required. Covert breaching is characterized by using stealth to reduce obstacles with the support and assault forces executing their mission only if reduction is detected.

(5) Combined arms breaching operations require the constant application of the factors of METT-T and the concentrated use of supporting arms. Fundamentals of combined-arms breaching operations have evolved in concert with the fundamentals of ground combat and provide a logical and time-proven set of rules. These fundamentals are reflected in the acronym and memory aid SOSRA as shown in Figure III-1.

(6) The most effective means of countering a mine or other EH is to prevent their employment. Proactive counter operations destroy enemy mine or other EH manufacturing and storage facilities or laying capabilities before the mines or EHs are laid. Planners must consider enemy storage and mine production facilities and assets for inclusion on the target lists. In addition to destroying mine or EH manufacturing and storage facilities of sites, units must consider targeting enemy engineers and equipment capable of laying mines or personnel designated for placing or activating EHs.

c. **Clearing Operations.** Clearing operations are conducted to completely eliminate obstacles, whether along a route or in a specified area. Obstacles may be explosive or nonexplosive. Clearing operations involving explosive obstacles are especially difficult because the detection systems employed are imperfect and neutralization systems available are only partially effective. See Appendix G, "Improvised Explosive Device Defeat," for more information on improvised explosive devices and clearing operations. Clearing operations will not generally be conducted under enemy observation and fire. As with all mobility operations, an intensive reconnaissance effort is imperative to clearing operations. Clearing operations may be conducted in conjunction with or in support of any of the other mobility operations. For example, the establishment of a forward LZ may require an area or route clearance operation to support access to the site.

For a general discussion of clearing (route and area) operations see FM 3-90.11, Combined Arms Mobility Operations. For a discussion of clearing tactics, techniques, and procedures see FM 3-34.210, Explosive Hazards Operations; FM 3-34.214, Explosives and Demolitions; and Field Manual-Interim (FMI) 3-34.119/Marine Corps Information Publication (MCIP) 3-17.01, Improvised Explosive Device Defeat.

d. **Gap Crossing Operations.** Gap crossing operations are conducted to project combat power over linear obstacles or gaps. There are three general types of gap crossing operations

(deliberate, hasty, and covert). The commander, with recommendations from the engineer and other staff members, task-organizes capabilities to support gap crossing operations. At the BCT/RCT level, any organic combat engineer companies will typically require augmentation by additional engineer capabilities for most gap crossing operations. Appendix B, “Land Mobility Capabilities,” provides information on those capabilities that are most likely to augment the BCT to conduct mobility operations. Combat engineers conduct gap crossings in support of combat maneuver using tactical (assault) bridging equipment to span smaller gaps, heavy equipment (or the employment of fascines and other solutions) to modify the gap, or through the use of expedient bridging (rope bridges, small nonstandard bridging using local materials). Engineers may be tasked to provide additional crossing capabilities such as bridging equipment. River crossing is a unique gap crossing mission that requires specific and dedicated assets from all of the warfighting functions.

For a discussion of river crossing and other types of gap crossings, refer to FM 3-90.12/MCRP 3-17.1, Combined Arms Gap Crossing Operations.

e. Special Considerations

(1) The amphibious breach is a type of deliberate breach specifically designed to overcome antilanding defenses in order to conduct an amphibious assault. Units conduct an amphibious breach when no other landing areas are suitable for the landing force (LF). Bypassing an integrated landing defense is preferred over conducting an amphibious breach whenever possible; however, the commander must always consider whether a bypass would produce additional risks. Synchronization and teamwork are essential for a successful amphibious breach, which is characterized by thorough reconnaissance, detailed planning, extensive preparation and rehearsal, and a buildup of combat power.

See MCWP 3-17.3, MAGTF Breaching Operations, and JP 3-02, Joint Doctrine for Amphibious Operations, for a detailed discussion of amphibious breaching operations.

(2) Urban terrain is complex terrain that affects the tactical options available to the commander and requires a thorough knowledge of unique terrain characteristics, detailed planning down to the smallest unit level, and sound leadership at all levels. The complexities of the urban environment, such as line of sight restrictions, inherent fortifications, limited intelligence, densely constructed areas, and the presence of noncombatants, restricts current military technology. US forces do not possess the overwhelming technology advantages in an urban environment as in other environments.

See FM 3-06.11, Combined Arms Operations in Urban Terrain, and JP 3-06, Doctrine for Joint Urban Operations, for a broader discussion of urban operations.

3. Countermobility Considerations

a. **General.** The objective of barrier, obstacle, and mine warfare employment is to delay, disrupt, and attrite enemy forces and protect friendly forces. This employment is not an end in

itself, but is in support of the maneuver plan. This section discusses the employment of barriers, obstacles, and mines employed to counter the enemy's freedom of maneuver. Survivability operations are often integrated with countermobility operations (especially during defensive operations) to support the protection of personnel and equipment overwatching the barriers, obstacles, and minefields as a part of an engagement area.

See FM 90-7, Combined Arms Obstacle Integration, for a more detailed discussion of the employment of barriers, obstacles, and land mines. Also see Appendix C, "Land Countermobility Capabilities."

b. Employment Principles

(1) Barriers, obstacles, and minefields should be evaluated from both an offensive and a defensive posture.

(2) Barriers, obstacles, and minefields should directly support the maneuver plan.

(3) Reinforcing obstacles should be integrated with existing barriers and obstacles to support the commander's intent and operational concept.

(4) Barriers, obstacles, and minefields are more effective when employed in depth.

(5) By varying the type, design, and location of reinforcing obstacles, the enemy's breaching operation is made more difficult.

(6) The effectiveness of barrier, obstacle, and mine employment can be affected by the air situation.

(7) Coverage by observation and by direct or indirect fire is essential in order to restrict enemy breaching efforts, maneuver, and massing of forces and to increase the destruction of the enemy. Planned on-call fires (indirect and/or direct) are ideal for this purpose.

c. Countermobility Resources. The employment of land mines and other obstacles to support the friendly scheme of maneuver is resource intensive. Combat engineers and others must have the barrier materials, mines, demolitions, and wire as well as the equipment needed to emplace/build the obstacles. There will often be competing priorities for the use of engineers, the transport of necessary needed materials and equipment, and the materials and equipment needed to perform the work to support the obstacle effort. The following four categories provide a useful framework for describing the resources required for effective countermobility operations:

(1) **Land mines are categorized as conventional (or persistent) and scatterable (or nonpersistent).** Both categories provide antitank and antipersonnel capabilities. **Conventional mines are no longer the most commonly used by US forces,** and US forces are limited to the use of self-destructing antipersonnel mines. Many conventional mines are activated by pressure or contact. These mines are laid by hand or mechanical means, buried or surface

laid, and normally emplaced in a pattern to aid in recording. Mechanical laying may be restricted by terrain conditions. The emplacement of conventional minefields is normally time-, manpower-, and logistics-intensive. **Scatterable mines are the most commonly used by technically advanced nations and are emplaced without regard to classical patterns.** Although locations of each individual mine cannot be precisely recorded, scatterable minefields can be accurately recorded to within plus or minus 10 meters when emplaced. They are emplaced by ground mine dispensing systems, artillery, aircraft, or by hand. They are designed to self-destruct after a set period of time, ranging from 4 hours to 15 days. Scatterable mines significantly reduce manpower requirements associated with MIW. Smaller and lighter, these mines offer a reduction in logistic requirements because of their reduced bulk and weight. Scatterable mines also make it possible to emplace minefields quickly and, importantly, to do so deep in the enemy's rear area such as at an air base, LOCs, air defense site, or an assembly area. The main disadvantage of scatterable mine employment is that the most flexible and responsive means of delivery - aircraft and artillery - have other, often competing, roles. Other disadvantages include the time and high number of artillery rounds or aircraft sorties required to emplace a minefield and increased exposure of emplacing artillery to counter battery fires and that of exposing emplacing aircraft or helicopters to enemy air defenses.

(2) **Demolition obstacles are created by the detonation of explosives.** Demolition is generally used to create tactical level obstacles. However, it can also be used to create operational obstacles such as the destruction of major dams, bridges, and railways as well as highways through built-up areas or terrain chokepoints. Demolition obstacles are typically classified as preliminary or reserved obstacles. **Preliminary obstacles are those planned by subordinate commanders,** are not considered critical to the JFC's plan, and can be detonated as soon as they are prepared or as the situation dictates. **Reserved obstacles are those deemed critical to the JFC's or subordinate commander's plan and are detonated only when directed by the commander who designated them.** Demolition obstacles may require lengthy completion time and large quantities of demolition materials because of the size and characteristics of the target.

(3) **Constructed obstacles are man-made,** created without the use of explosives. Typical tactical examples are barbed wire obstacles and tank ditches. Operational and strategic barriers and obstacles may also be constructed. Examples are fortified areas and lines. These large-scale obstructions generally require extensive time, manpower, equipment, and material. In general, engineers will play a major role in obstacles of this magnitude. Constructed barriers and obstacles should be emplaced before hostilities or in areas not subject to observed fires, because construction personnel can be exposed to all types of enemy fire.

(4) **Field expedient obstacles.** When mines, barrier materials, or engineer resources are not available or are in short supply, the JFC may have to rely on field-expedients such as abatis, flame field expedient, or IED for employment in place of obstacles and minefields. Field expedients can be hastily constructed from materials found on the battlefield, such as containers, fuel, and explosive devices. They can provide a quick, effective means for providing a limited offensive and defensive obstacle capability when conventional resources are not available.

d. **Offensive Employment.** In the offense the JFC, through the joint force staff, identifies priority locations and plans and coordinates the joint emplacement of barriers, obstacles, and minefields. Under some circumstances, the JFC may designate the systems that subordinate commanders utilize for emplacement. These barriers, obstacles, and minefields generally focus on isolating the battlefield, facilitating economy of force, enhancing overall force security, and blocking or delaying an enemy's withdrawal. During planning and deployment, care must be taken to ensure that the mobility of the attacking force is not hindered. Key factors for consideration in offensive employment are:

- (1) The scheme of maneuver for the operation.
- (2) Current enemy situation capabilities, intent, and probable COAs.
- (3) Accurate terrain analysis to determine where friendly forces are vulnerable to counterattack.
- (4) Preplanning, deconfliction, and coordination with other components.
- (5) C2 of obstacle and mine emplacement.
- (6) Information flow to inform friendly forces of friendly and enemy barrier, obstacle, and minefield locations using the standard report formats.

e. **Defensive Employment.** As in the offense, the JFC, through the joint force staff, identifies priority locations and plans and coordinates the joint emplacement of barriers, obstacles, and minefields. Under some circumstances, the JFC may designate the systems that subordinate commanders use for emplacement. The primary intent of defensive barrier, obstacle, and mine warfare employment is to degrade enemy capabilities by disrupting combat formations and delaying their movement, interfering with C2, and confusing enemy commanders. The secondary intent is to destroy or attrit enemy forces. Key factors for consideration in defensive employment are as follows:

- (1) Current enemy situation, capabilities, intent, and probable COAs.
- (2) Confirmation of where the maneuver commander has designated engagement areas and wants to kill the enemy.
- (3) Confirmation of the scheme of maneuver for the defense.
- (4) Accurate terrain analysis to determine where friendly forces are vulnerable to enemy attack.
- (5) Preplanning, deconfliction, and coordination with other components.
- (6) C2 of obstacle and mine emplacement.

(7) Information flow to inform friendly forces of friendly and enemy barrier, obstacle, and minefield locations using the standard report formats.

(8) Barrier, obstacle, and minefield emplacement which must be integrated to complement the plan for defense.

(9) Conventional minefields and other time- or labor-intensive obstacles that can be emplaced before the beginning of hostilities, reducing the exposure to enemy fire. (This also increases the time available to mass the large amount of supplies needed to construct the barriers, obstacles, and minefields.)

(10) Preplanned employment of scatterable minefields throughout the operational environment. The choice of scatterable systems is mission-dependent. Ground emplaced mine scattering systems are best for rapidly emplacing large minefields in friendly controlled areas. Artillery or aircraft-delivered systems are employed throughout the battlefield. The appropriateness of artillery or aircraft delivery systems varies depending on the threat conditions and other mission priorities; however, organic systems should be employed whenever possible.

(11) Analysis of the effects of scatterable mines in the defense with respect to self-destruct times. The timetable for friendly operations may be upset or cause fratricide if the wrong self-destruct settings are used.



Logistic planning must provide for replacement of special equipment and materials to support breaching operations.

(12) Obscurants, used as a limited obstacle to canalize or slow advancing enemy forces. When combined with barriers, obstacles, and/or minefields, obscurants can enhance the vulnerability of enemy forces by limiting their visual, target-acquisition, and intelligence-gathering capabilities.

f. **Other Considerations.** The overriding consideration in planning obstacles is accomplishment of the mission; however, there are three considerations that may not be apparent in terms of the current military mission.

(1) **Legal Restrictions.** The creation and employment of countermobility barriers, obstacles, and mines must comply with the law of war, as well as US law and policy. The JFC will ensure that the staff judge advocate is integrated into the planning process and that countermobility plans — especially those involving the emplacement of mines — receive a legal review prior to execution.

(2) **Obstacle-clearing operations at the cessation of hostilities.** Obstacle-clearing operations continued for years in Kuwait following the end of the 1990-1991 Persian Gulf War, largely due to a lack of accurate minefield records by the defending Iraqi forces. Mine and minefields continued to threaten civilians long after hostilities were concluded and caused numerous casualties to military and civilian personnel. Accurate reporting, recording, and tracking not only will prevent fratricide but will expedite clearing operations when peace is restored.

For a general discussion of clearing (route and area) operations see FM 3-90.11, Combined Arms Mobility Operations. For a discussion of clearing tactics, techniques, and procedures see FM 3-34.210, Explosive Hazards Operations; FM 3-34.214, Explosives and Demolitions; and FMI 3-34.119/MCIP 3-17.01, Improvised Explosive Device Defeat. See also Appendix F, "Humanitarian Mine Action," for more discussion.

(3) **Commanders also consider the effects of obstacles on noncombatants and their environment.** Obstacles frequently modify terrain through demolition, excavation, and other means. Some obstacle actions, such as destroying levees, setting fires, felling trees in forested areas, or demolishing bridges, may have immediate impacts on noncombatants and often will have long-term effects on them and their environment. Commanders minimize the effects of obstacles on noncombatants and the environment if militarily possible. For example, if the enemy can be prevented from using a bridge by means other than demolishing it, commanders may choose the less damaging COA. Commanders avoid unnecessary destruction of farmland or forests or pollution of water sources when creating obstacles. Care exercised by commanders will alleviate long-term negative effects on noncombatants, friendly forces, and the environment.

TACTICAL DECISIONS LEADING TO STRATEGIC CONSEQUENCES



The Al Fathah Bridges (highway and railway) cross the Tigris River 100 kilometers southwest of Kirkuk. These bridges were damaged/destroyed by Coalition Forces bombing during the Gulf War to interdict rail and road traffic. When the highway bridge span was taken out, 16 pipelines located in conduit beneath the bridge surface were cut and the ability to move oil from the Northern Oil Fields located in Kirkuk to the Baiji Refinery across the Tigris River were lost. Also, the ability to move crude oil from the oil fields to the Iraq—Turkey export pipeline was eliminated. When the pipelines are restored at this river crossing the export value of oil will be \$7 million daily.

As V (US) Corps was pushing their way towards Baghdad, a call came down from US Central Command (USCENTCOM) stating that a special operations force (SOF) team operating in the vicinity of Al Fathah was compromised and was retrograding to avoid capture (destruction) by a more dominate Iraqi force. The SOF Team's plan was to cross the Tigris River over the Al Fathah bridge, and destroy the bridge to create a blocking position and buy time for an extraction. This plan quickly made its way to USCENTCOM via SOF liaison officers, knowing that the decision to destroy this bridge was at the Combined Force Land Component Commander's (CFLCC) discretion, USCENTCOM sent a communication to CFLCC for concurrence on execution of this blocking position. When the call came into the CFLCC Future Operations Staff, the Engineer desk was immediately notified of the SOF Team's situation. Using an online database, the CFLCC Future Engineer



Desk quickly learned that the Al Fathah Bridge also contained within it a 30 inch strategic oil pipeline – Iraq’s primary means of exporting oil to the north (through Turkey). This information was quickly relayed back to USCENTCOM, but, by this time, it was known that the SOF Team had called for and executed an immediate air strike to destroy the bridge, and concurrently, severing the strategic oil pipeline, as well as numerous municipal conduits for the city of Al Fathah. The flow of information between headquarters was extremely efficient, but not in time to influence a direct tactical fight.

Following hostile combat action, the repair of the northern strategic pipeline was delayed by many months, due to the severing of the AL Fathah bridge (Note: There was an environmental issue of cleaning up the oil spilled during this bridge takedown).

This delay cost millions of dollars in lost oil exports, money that was critically needed for the building of Iraq.

4. Command and Control

a. **Planning.** Commanders and staffs consider both friendly and enemy use of obstacles when planning operations. At the tactical level (in the BCT) an assured mobility section brings focus to mobility, countermobility, and survivability task planning in support of breaching, clearing, and gap crossing operations. At operational levels, a countermobility area of concentration is on granting obstacle-emplacement authority or providing obstacle control. At the BCT/RCT level, commanders focus on identifying the scheme of maneuver that must be supported by mobility and/or countermobility efforts. At each level, commanders include obstacle

planning in the decision-making process. This ensures that a combined arms approach to mobility operations, as well as countermobility obstacle integration, is effective in support of the maneuver plan.

b. **Reconnaissance.** Reconnaissance is performed before, during, and after mobility operations to provide information used in the planning process as well as by the commander to formulate, confirm, or modify the COA. The information gathered through reconnaissance and analysis of terrain and other geospatial products effectively targets the mobility operation. Tactical reconnaissance supporting mobility operations should focus on OBSTINTEL — those collection efforts to detect the presence of enemy (and natural) obstacles, determine their types and dimensions, and provide the necessary information to plan appropriate combined arms breaching, clearance, or bypass operations to negate the impact on the friendly scheme of maneuver. Tactical reconnaissance also allows friendly forces to anticipate when and where the enemy may employ obstacles that could impede operations as well as verifying the condition of natural or other man-made obstacles.

c. **Control Means.** Obstacle control varies with echelon and METT-T. The basic idea is to limit subordinates only as necessary to synchronize their obstacle efforts with the commander's intent and scheme of maneuver. A lack of obstacle control can cause obstacles to interfere with the higher commander's scheme of maneuver. Too much obstacle control can cause a lack of obstacles that support the refined fire plans of subordinate commanders. To provide obstacle control, commanders focus or withhold obstacle-emplacement authority or restrict obstacles. They use obstacle-control measures, orders, or other specific guidance. Commanders and staffs consider width, depth, and time when they conduct obstacle-control planning. The following considerations guide this planning:

- (1) **Support current operations.**
- (2) **Maximize subordinate flexibility.**
- (3) **Facilitate future operations.**

d. **Reporting, Recording, and Marking**

(1) Intelligence concerning enemy minefields is reported by the fastest means available. Spot reports (SPOTREPs) are the tactical commander's most common source of minefield intelligence. They originate from patrols that have been sent on specific minefield reconnaissance missions or from units that have discovered mine information in the course of their normal operations. The information is transmitted to higher headquarters and tracked in joint minefield and obstacle databases.

(2) Lane or bypass marking is a critical component of obstacle reduction. Effective lane marking allows commanders to project forces through an obstacle quickly, with combat power and C2 intact. It gives an assault force and follow-on forces confidence in the safety of the lane and helps prevent unnecessary casualties.

FM 3-90.11, Combined Arms Mobility Operations, and MCWP 3-17.3, MAGTF Breaching Operations, provide a detailed discussion of marking operations.

Intentionally Blank

CHAPTER IV MARITIME OPERATIONS

“The clever combatant imposes his will on the enemy, but does not allow the enemy’s will to be imposed on him.”

Sun Tzu

1. General Discussion

a. **General.** During maritime operations, MIW consists of the strategic, operational, and tactical use of mines and mine countermeasures (MCM). It is divided into two basic subdivisions: the laying of mines to degrade the enemy’s capabilities to wage land, air, and maritime warfare; and the countering of enemy-laid mines to permit friendly maneuver or use of selected land or sea areas. Since the invention of the Bushnell Keg in 1776, MIW has been an important element of naval warfare. Sea mines and MCM have played a significant role in every major armed conflict involving the United States since the Revolutionary War. Mines on the world arms markets are inexpensive, easy to procure, reliable, effective, and difficult for intelligence agencies to track. More than 50 of the world’s navies have minelaying capability while a considerable number of countries, many of which are known mine exporters, actively engage in development and manufacture of new models. Although most of those stockpiled are relatively old, they remain lethal and can often be upgraded. Thus, this weapon system has an extremely favorable investment return (cost of munitions vs. extent of damage ratio). In no other phase of warfare do environmental considerations in both tactics and planning play a more dominant role than in MIW. Mine cases, mine sensors, target signals, and MCM systems are all affected to some extent by a large number of environmental factors. Many of these are of major importance and may affect the selection of MCM equipment or procedures. The basic decisions to hunt or sweep, and subsequent techniques to be used in an area, are based on an assessment of the environment.

b. **Influence of the Environment.** In strategic, operational, tactical, and technical planning for both mining and MCM, the environment plays a critical role. The Mine Warfare Environmental Decision Aids Library (MEDAL) is the primary tactical planning and evaluation tool. MEDAL, a segment of Global Command and Control System-Maritime, provides access to MIW environmental and mine threat databases that support this planning function. Minelaying missions are mainly conducted only if environmental conditions are favorable for delivery and weapon effectiveness after placement. Mines and components (cases, sensors, and target signals) are all affected in significant ways by a myriad of environmental factors. The fundamental decisions in MCM to conduct exploratory and reconnaissance operations, as well as which MCM technique to employ, are found in a matrix summary of environmental factors affecting MCM provided in Figure IV-1.

A more detailed examination of environmental factors affecting mine countermeasures can be found in NWP 3-15, Naval Mine Warfare.

ENVIRONMENTAL CONSIDERATIONS IN MINE COUNTERMEASURES		
Category	Factors	Major Operation Impact
Coastal Topography and Landmarks	Marginal topography, natural and man-made landmarks, aircraft flight path hazards, shoals, and other underwater hazards to surface craft	Navigational control, accuracy flight restrictions, and pattern controls
Atmospheric Characteristics	Climatic conditions, duration of darkness and light, visibility, air temperature, winds, precipitation, storm frequency, and icing conditions	All operational limitations and restrictions common to adverse atmospheric conditions, platform and equipment selection, force level requirements, and logistic concerns
Water Depth	Bathymetry, seasonal storms, river run-off	Extent of operational area in relation to mine type to be countered, choice of countermeasures, platforms, gear and tactics; limits to diver employment
Sea and Surf	Sea and swell condition, surf characteristics	Operational limits for surface craft, explosive ordnance disposal personnel, and mine countermeasures equipment; actuation probability for pressure mines; rate and direction of sweep or hunt; mine detection capability
Currents	Surface and subsurface current patterns, including tidal, surf, and riverine-originated currents	Navigation and maneuver of displacement craft and towed equipment; navigational error; diver operation limitations; effect on mine burial
Ice Conditions	Thickness and extent of sea ice	Modify, restrict, or preclude operations depending on extent and thickness of ice
Water Column Properties	Water temperature, salinity, and clarity	Temperature effects on diver operations; ability to visually or optically locate moored or bottom mines; temperature/salinity compilation of conductivity for magnetic sweep; sonar depth and effectiveness
Seabed Characteristics	Bottom roughness, material, strength, and stability	Decision to employ minehunting techniques; limitations on mechanical sweep gear; extent to which a mine will bury
Acoustic Environment	Sound velocity profile, acoustic propagation/attenuation, acoustic scattering, and reverberation	Sonar settings, ranges, and effectiveness, acoustic sweep path and sweep safety, number of mine like contacts, and sonar hunting efficiency
Magnetic Environment	Electrical conductivity, number of magnetic mine-like contacts, ambient magnetic background	Ability to employ open electrode sweeps; extent and strength of magnetic field established by magnetic sweep gear; number of minelike targets limiting magnetic hunt efficiency; effectiveness of magnetometer detectors
Pressure Environment	Natural pressure fluctuations due to wave action	Actuation probability for pressure mines and, hence, the selection of conventional or guinea pig sweep techniques
Biologic Environment	Bio-fouling conditions, hazardous marine life	Ability to detect and classify mines visually or with sonar; marine life presenting potential hazard to divers

Figure IV-1. Environmental Considerations in Mine Countermeasures

2. Mining

Mining is one of the two distinct subdivisions of MIW. This warfighting discipline is used to support the broad tasks of establishing and maintaining control of essential sea areas. Mining embraces all methods whereby naval mines are used to inflict damage on adversary shipping to hinder, disrupt, and deny adversary sea operations. Mines may be employed either offensively or defensively to restrict the movement of surface ships and submarines. They can be used alone to deny free access to ports, harbors, and rivers, as well as movement through SLOCs. Sea mines can also be used as a force multiplier to augment other military assets that will reduce the surface and submarine threat. Such an operation is intended to inflict damage on ships that challenge the minefield, thereby having an adverse effect on their defensive, offensive, and logistic efforts. It can also force the adversary to conduct a concerted MCM effort that exceeds the magnitude of the mining operation itself. Ships detained at their base or impeded in transit may be rendered as ineffective for the immediate war effort as if they were otherwise sunk or destroyed. Further, delays in shipping may be as costly as actual losses. The threat posed may be real or perceived, but mining has a significant psychological impact on the adversary by forcing him to combat an unknown force.

a. **Mining Objectives.** In the event of war, the ability of the United States Navy (USN) to carry out its primary mission of maintaining control of the seas can be seriously threatened by enemy subsurface, surface, and air forces. US mining can be employed to reduce that submarine and surface threat. In addition, offensive measures may be required against merchant ships and may include the restriction of certain passages to all shipping. For these reasons, mining complements and comprises an essential part of other warfare areas, particularly antisubmarine and antisurface warfare operations. Sea mines, or the implicit threat that attends their possible presence, may deny the enemy the free and safe use of sea areas vital to their operations, or conversely, sea mines may be used to protect friendly harbors, channels, and shores against amphibious assault. Delays and interruptions in shipping of war-sustaining materiel may deprive the enemy of critical offensive and defensive capabilities. History has shown that enemy ships confined to their bases or deterred in transit by mining operations become ineffective in their contribution to the immediate war effort and delays in shipping may be as costly as actual losses.

b. **United States Mining Policy.** In the event of war, US policy will be to conduct offensive, defensive, and protective mining as necessary. The purpose is to reduce the enemy submarine and surface combatant threat by destruction and disruption of their operations, to interdict the enemy SLOCs and designated ports in order to neutralize or destroy combatant and merchant ships, and to defend US and allied shipping. More specifically, naval mines may be used in conjunction with other warfare forces to aid in sea control by:

(1) Denying enemy use of designated ocean areas, ports, or waterways for diplomatic, economic, or military purposes.

(2) Influencing enemy maneuver and direction or otherwise restricting the enemy's movements to buttress the operational effectiveness of friendly forces.

- (3) Protecting ports, coastal lines of passage, Q-routes, and designated operating areas.
- (4) Destroying enemy ships and submarines directly.
- (5) Establishing blockades to provide political leverage in a limited war situation.
- (6) Denying the enemy the ability to carry out amphibious operations.

3. Service Considerations

a. **Army-Navy.** Naval (USN and US Marine Corps [USMC]) responsibility ends at the landward limit of the craft landing zone (CLZ) along seashores, but extends inland where waters are navigable from the sea. Where navigation is no longer possible by seagoing vessels, USN responsibility normally ends. If maritime assets are capable of conducting MCM in a waterway where US Army (USA) craft need to navigate, it is likely that the MCC will be directed to clear those mines. A mining threat in the US, at choke points along SLOCs, or at ports of debarkation can delay or completely halt the movement of material required to support overseas campaigns. Joint task force (JTF) commanders, confronted by a mining threat, will request MCM assets through the combatant commander. In some cases, MCM forces from North Atlantic Treaty Organization (NATO) or allied nations may, after appropriate national coordination, provide MCM support.

b. **Air Force-Navy.** The United States Air Force (USAF) plays two important roles in supporting MIW forces (in addition to supporting offensive MCM). The first is the laying of mines. USAF bomber aircraft can deliver mines at long distances from the US, playing a critical role in accomplishing mining plans directed by joint commands. The second is the Air Mobility Command's (AMC's) deployment of airborne mine countermeasures (AMCM) and underwater mine countermeasures (UMCM) forces, and MIW C2 elements and the continuing delivery of critical repair parts via AMC aircraft. Even in a situation where all MCM forces deploy by surface lift, rapid delivery of critical repair parts is crucial to maintain MCM force readiness. For offensive MCM, the USAF is a key component of the joint assault breaching system in support of the Army, Marine Corps, and Navy.

c. **Marine Corps-Navy.** In support of amphibious operations in a mined environment, USMC breaching assets will be carried toward shore by USN displacement craft and landing craft air cushion. Explosive mine clearance systems or methods will be required for "brute force" clearance of the surf zone (SZ) to high water mark (HWM) through use of the joint assault breaching system. The clearance of assault lanes through the very shallow water zone (40- to 10-foot depth contour) will be executed by Naval Special Clearance Team One (NSCT1). Rapid deployment of USMC forces (other than those already embarked on amphibious shipping) is accomplished by airlift of personnel to a benign location where they can be united with equipment stored on maritime pre-positioning ships squadron (MPSRON) ships. In the same manner as Military Sealift Command shipping carrying USA material or surface mine countermeasures (SMCM) craft, the MPSRON ships must be provided clear channels, safe anchorages, and harbors in which to unload their material. In some situations the MPSRON

ships will join the amphibious ships and be supported by MCM forces to establish logistics over-the-shore operations.

d. **United States Coast Guard.** The United States Coast Guard (USCG) is part of the Department of Homeland Security, except when directed to transfer to the Department of the Navy for operations upon declaration of war or when otherwise directed by the President. The Commanders, Atlantic and Pacific Coast Guard areas are USCG flag officers who are also designated Commanders, Coast Guard Defense Forces East and West, respectively, for the joint force maritime component commands of US Northern Command (USNORTHCOM) and US Pacific Command (USPACOM). Coast Guard area commanders are empowered to assign appropriate USCG forces to the joint force maritime component commander (JFMCC) to support MIW operations. USCG assets are frequently included in exercises where mining and MCM are involved. Prior to initiating mining and MCM exercises in areas that are not regular USN operational areas, the Commander, Mine Warfare Command must establish liaison with Commander, Coast Guard Defense Forces East or West as appropriate. Commander, Coast Guard Defense Forces East or West will notify subordinate USCG commands and coordinate USCG participation/support as required. USCG Juniper class buoy tenders have been and may be used to conduct survey operations in a number of scenarios using portable side-scan sonar equipment. USCG assets will likely support route survey and MCM forces conducting MIW operations in US territorial waters in times of conflict.

e. For additional information on maritime mining capabilities refer to Appendix D, “Maritime Mining Capabilities.”

4. Mine Countermeasures

MCM is the second of the two distinct disciplines that constitute MIW. MCM includes all actions undertaken to prevent enemy mines from altering friendly forces’ maritime plans, operations, or maneuver. MCM reduces the threat and effects of enemy-laid sea mines on friendly naval force and seaborne logistic force access to and transit of selected waterways.

a. MCM operations (MCMOPS) are divided into two broad areas: offensive and defensive MCM (see Figure IV-2).

(1) **Offensive MCM.** The most effective means of countering a mine threat is to prevent the laying of mines. Offensive MCM destroy enemy mine manufacturing and storage facilities or mine laying platforms before the mines are laid. Although an adjunct of MIW, these operations are not normally conducted by MIW forces. Therefore, staff MCM planners must ensure that enemy mine layer, mine storage and, ultimately, mine production facilities and assets are considered for inclusion on joint target lists.

(2) **Defensive MCM.** Defensive countermeasures are designed to counter mines once they have been laid. Some measures are undertaken following the termination of conflict solely to eliminate or reduce the threat to shipping posed by residual sea mines. However, most defensive

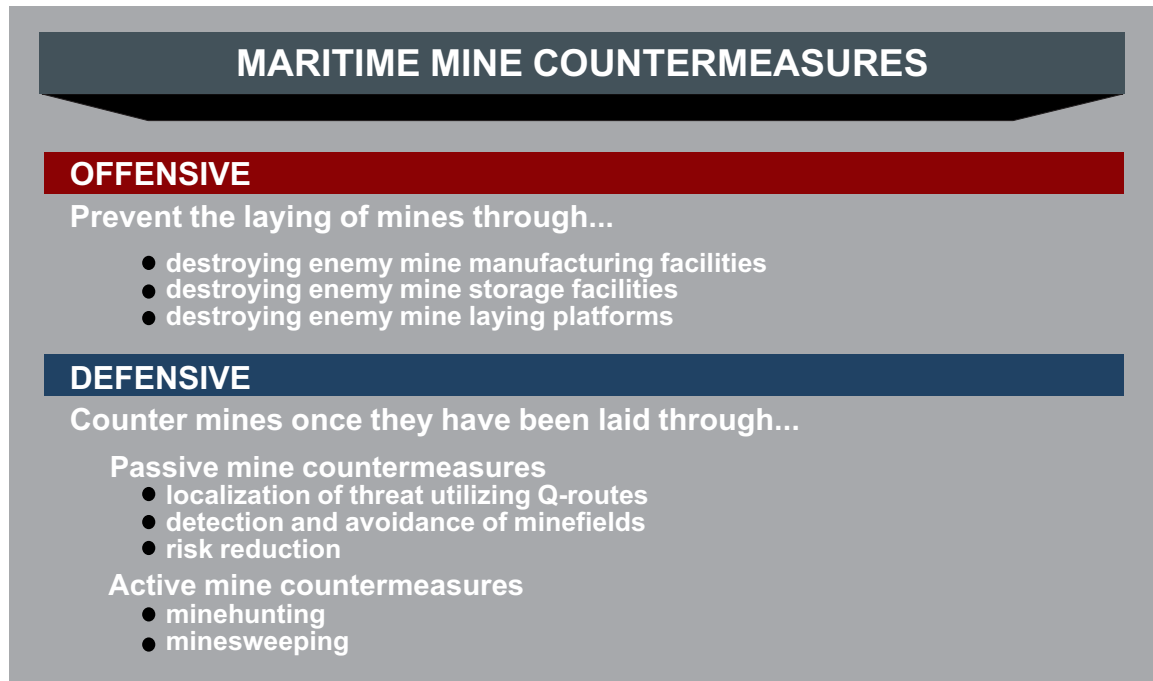


Figure IV-2. Maritime Mine Countermeasures

MCMOPS are undertaken during conflict to support (enable) other maritime operations, such as power projection. Defensive MCM includes passive and active MCM.

(a) Passive MCM reduce the threat from emplaced mines without physically attacking the mine itself, through reduction of ship susceptibility to mine actuation. Three primary passive measures are practiced: localization of the threat, detection and avoidance of the minefield, and risk reduction.

1. Localization of the threat engenders the establishment of a system of transit routes, referred to as Q-routes, which will be used by all ships to minimize exposure in potentially mined waters. Establishment of transit routes should be one of the first steps taken by MCM planners, if the routes have not been previously designated, to minimize exposure of shipping and permit concentration of active MCM efforts.

2. Detection and avoidance of minefields can be accomplished by exploiting intelligence information or organic MCM forces. When the location has been established, shipping may be routed around the area.

3. Risk reduction is primarily practiced by individual ships rather than planned and executed by MCM forces. Risk may be reduced by controlling the degree of potential interaction with a mine sensor. Against contact mines, a reduction in draft and posting additional lookouts can reduce the number of mines with which the ship's hull might strike. Influence mines can be denied the required activation signals by controlling the ship's emissions. Use of on-board magnetic field reduction equipment or external degaussing, silencing a ship to minimize radiated noise, or using minimum speeds to reduce pressure signature are examples of operational



A primary method of protecting shipping from enemy mines is in detection and avoidance of minefields.

risk reduction. Other types of risk reduction involve the enhancement of ship survivability in the event of mine detonation.

(b) Active MCM are applied when passive measures alone cannot protect traffic. This entails physical interference with the explosive functioning of the mine or actually destroying it. Minehunting and minesweeping are the primary techniques employed in active MCM. Both require detailed intelligence and extensive planning by the MCM commander (MCMC) to counter the threat effectively.

1. Minehunting. Minehunting involves the employment of sensor and neutralization systems, whether air, surface, or subsurface, to locate and dispose of individual mines. Minehunting is conducted to eliminate mines in a known field when sweeping is not feasible or desirable, or to verify the presence or absence of mines in a given area. High-resolution sensors are used to locate mines. When located, mine neutralization is performed through the use of remote-controlled vehicles, NSCT1, or explosive ordnance disposal (EOD) divers to visually identify the mines and plant charges to destroy them. Minehunting poses less risk to MCM forces, covers an area more thoroughly, and provides a higher probability of mine detection than minesweeping.

2. Minesweeping. Minesweeping is conducted by either surface craft or aircraft and involves the towing of mechanical or influence sweep systems. Mechanical sweeping employs specially equipped cables to sever moored mine cables so that the mines float to the surface, where the mines are then destroyed by EOD divers upon approval of the local commander.



Minesweeping is a method of active maritime countermeasure and is conducted by either surface craft or aircraft.

Influence sweeping involves the use of towed or streamed devices that emit acoustic, magnetic, or combination acoustic-magnetic signals to trigger influence mines. At present, the only method capable of activating a sophisticated pressure mine is the use of an actual ship, which is not a practicable sweep technique.

b. Intelligence Support

(1) **Intelligence Gathering.** Before maritime MCMOPS, intelligence may indicate the types, quantities, or locations of mine storage sites. This information precedes the surveillance of mine storage sites with overhead sensor systems and intelligence assets that detect movement of mine assets. All source-derived intelligence of mine movement to minelaying platforms and the subsequent movement of the minelaying platforms can provide advance information on the type, size, and location of minefields. Where mining is a possible threat, particularly in areas of crisis response and contingency operations, tracking and dedicated intelligence collection against this threat must begin early and be sufficiently systematic to provide confident estimates of mine activity. A joint MCM tracking team could be established to focus collection efforts in this area.

(2) **Mine Exploitation.** A key to countering any mine is a detailed knowledge of the mine sensor and targeting circuitry. All-source derived intelligence on the enemy minelaying operation can aid in determining the type of sensor and style of target processing used. However, more accurate data can be acquired by actually exploiting a mine recovered during MCMOPS. Exploitation may provide information on mine settings and mine modification intelligence.

c. **Planning Considerations.** The MCM planning process starts with an estimate of the situation and a mission statement that results ultimately in production of an MCM tasking order. Some aspects of the mission definition must be provided by the supporting commander.

(1) **Objectives.** The mission statement includes an objective for active MCM, an acceptable risk factor, and a specific operational area. In some cases, a measure of the effectiveness of the operation will be required. The MCMC must choose a specific objective from the list in Figure IV-3, as described below.

(a) **Exploratory.** The objective of exploration is to determine whether or not mines are present and is usually the first objective when an enemy minefield is suspected. If no mines are found, the confidence level of search accuracy is the measure of effectiveness (MOE).

(b) **Reconnaissance.** Reconnaissance operations are designed to make a rapid assessment of the limits of a mined area and the estimated number and types of mines present. The MOE is normally a value judgment based on the mine effectiveness, type, and degree of coverage for a given area using an established probability of detection and/or avoidance.

(c) **Breakthrough.** The breakthrough objective is directed when rapidity is required to open channels and staging areas for an amphibious operation or port break-in and/or

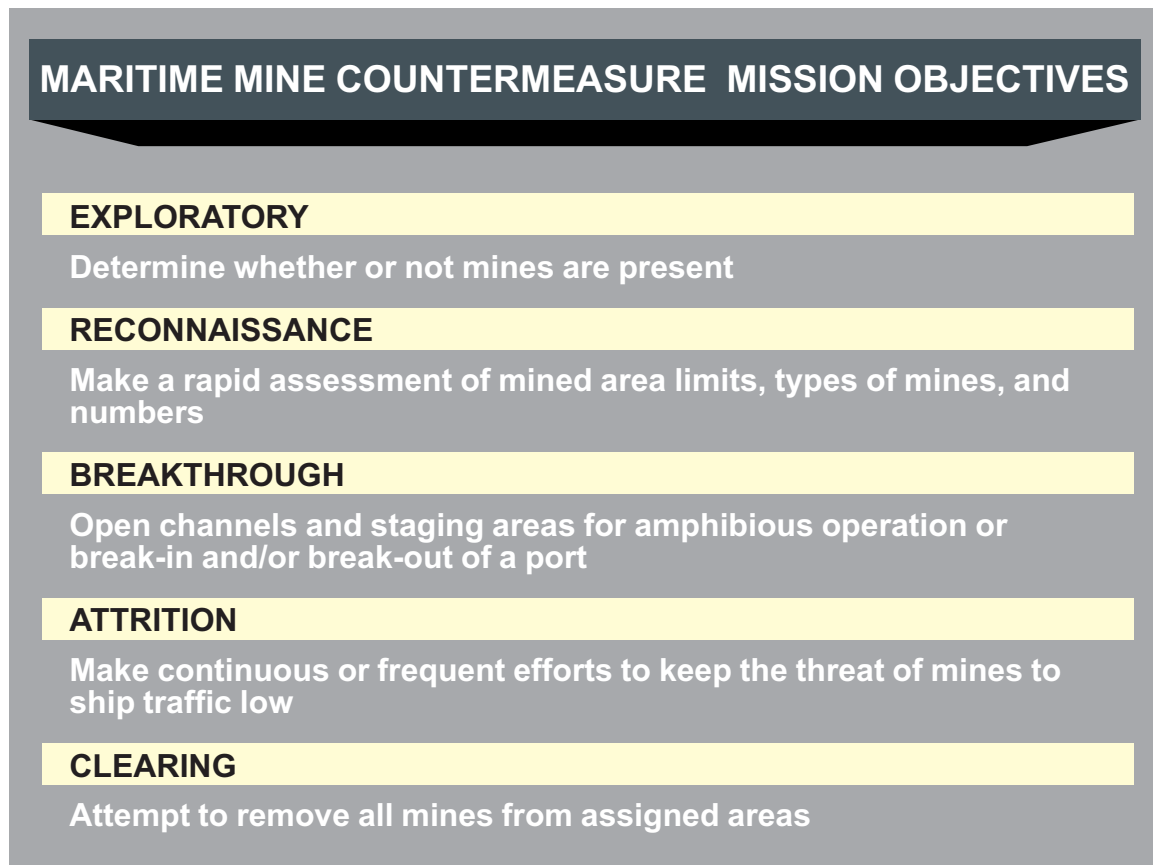


Figure IV-3. Maritime Mine Countermeasure Mission Objectives

break-out. This objective would be selected when there is insufficient time or forces for high percentage clearance operations. For breakthrough operations, the supported commander should indicate the amount of time available for MCMOPS. The MCMC should respond with the following estimates:

1. Initial threat to traffic that will remain following the MCMOPS that can be conducted in the available time.
2. Additional reduction of the threat achievable with additional time provided for MCMOPS.

(d) **Attrition.** Attrition objectives call for continuous or frequent MCM efforts to keep the threat of mines to ship traffic as low as possible when traffic must continue to transit the mined waters for a comparatively long period of time. Attrition is employed when mines cannot be quickly cleared because of factors such as enemy minefield replenishment or use of mines with arming delay or high ship counter settings. The supported commander should provide the MCMC with a desired initial threat to shipping goal and require reporting of estimated attainment of that goal.

(e) **Clearing.** The objective of clearing is to remove the mine threat from the assigned area. Because it is difficult to ensure that all mines are cleared, a percentage goal is assigned for mine removal to permit the MCMC to measure and report progress. For a clearing objective to be realized, MCM task organization must be sufficient to execute the mission in the time available, traffic through the field must be delayed until the clearance is completed, enemy replenishment of the field must be unlikely, and the majority of the mines must be vulnerable to at least one form of active MCM. A special aspect of the clearing objective is limited clearing, in which a minefield is cleared of only specified mine types. Limited clearing may be directed if there are inadequate MCM forces to conduct clearing operations in the time available or if available countermeasures are not effective against all mine types in the field. If the characteristics of the mines in a field can only be assumed, partial clearing can be tailored to the type of ship that must transit the field.

(2) **Risk Directives.** Some MCM techniques are inherently hazardous when used against certain mine types. To determine the proper MCM technique to employ, the MCMC must, in addition to an objective, be given some indication of the maximum acceptable degree of risk to MCM forces. When operations are constrained by time, a somewhat greater degree of risk must be accepted to accomplish the objective.

(3) **MCM Asset Availability.** MCM tactics are determined by the time and assets available. The time required to move MCM units to the mined area as opposed to the time available for completion of MCMOPS is a key determination. A primary capability of AMCM forces is to provide short-notice, rapid response to any mining threat. These forces sacrifice some degree of effectiveness and stamina to maximize response capability. On the other hand, SMCM forces are more effective but, because of relatively slow transit speeds, have protracted response times. For long distances, heavy-lift ships can transport SMCM units to the area of operations more quickly, and with less wear and tear. Whenever time and circumstances permit,

AMCM assets should be used for precursory minefield sweeping before employing SMCM assets. This provides greater safety margins for surface craft, which are more vulnerable to a mine actuation than are helicopters.

(4) **Amphibious Operations.** The performance of forcible entry assured access missions through the use of amphibious ships continues to evolve as designed according to espoused fundamentals in JP 3-18, *Joint Doctrine for Forcible Entry Operations*, and the Marine Corps warfighting documents: *Operational Maneuver From The Sea* and *Ship-To-Objective Maneuver*. It should be noted that the formulations of forcible entry missions are now in the active process of transitioning from concept to actual doctrinal principle. New concepts describe power projection as rapid maneuver from amphibious ships directly to objectives ashore, unimpeded by aspects of topography or hydrography. Consequently, naval forces must strive to discard hitherto accepted procedures such as operational pauses, phases, and reorganizations that erode momentum. However, MCM and amphibious breaching is still required to support amphibious operations and must be synchronized within the overall amphibious task force (ATF) timeline. Planning a successful MCM or amphibious breach requires the combined efforts of the commander, amphibious task force (CATF), commander, landing force (CLF), and MCMC. Early dialogue between CATF, CLF, and the MCMC will aid planners to identify detailed mission requirements. These considerations include:

(a) **Intelligence, Surveillance, and Reconnaissance.** A collection plan is a joint effort of the ATF intelligence organizations. Intelligence efforts should concentrate on establishing the type and location of the mine threat in the AOA, AOA characteristics, enemy locations, and intelligence on obstacles in the SZ and beyond.

(b) **Synchronization.** MCM and amphibious breaching operations require precise synchronization to ensure maximum effects of supporting arms and to minimize the risk to friendly forces. The determination of the ATF general COA dictates the size and composition of the LF and the general location and number of lanes required. Lane requirements and obstacle construction will dictate size and composition of the breach force. Reverse planning should be used to ensure that actions at the obstacles support actions on the objective.

(c) **Breaching Fundamentals.** Suppression, obscuration, security, and reduction are applied to all amphibious breaching operations to ensure success when breaching against a defending enemy.

(d) **Organization.** ATF forces must be organized to quickly and effectively reduce obstacles and expedite LF movement to the objective. Forces should be task-organized into support, breach, and assault organizations.

(e) **Command and Control.** Unity of command is critical in MCM or amphibious breaching operations. CATF, with the assistance of a breach force advisor from the CLF staff, executes the clearance effort from the SZ to the HWM and/or CLZ using task-organized USN, SOF, and LF elements. The MCMC mine clearance efforts begin at the seaward edge of the

mine threat area to the SZ, and the CLF task-organizes breaching elements in the assault waves to continue the breaching effort at the HWM, CLZs, and LZ.

(5) **Support Requirements.** Deployed MCM ships, helicopters, and EOD units are not self-sustaining. Communications, ordnance, recompression chambers, supply, personnel support, and petroleum, oils, and lubricants must be provided for these units. In addition, ships will require magnetic and acoustic calibration range services and intermediate maintenance support. Helicopter units will require hangar space, maintenance, and ground support equipment. Support may be provided to ships and EOD units by an assigned MCM support ship or an adjacent shore facility. Helicopter support may be provided by an adjacent airfield or by an air-capable MCM support ship. When operating near hostile enemy areas, force protection support requirements exist for all MCM platforms.

d. Organizational Support

(1) **Coast Guard Defense Forces.** Coast Guard Defense Forces East and West are commands established under the respective JFMCC to conduct maritime homeland defense missions for Commander, USNORTHCOM and Commander, USPACOM, including support for domestic MIW operations.

(2) **Naval Mine and Anti-submarine Warfare Command (NMAWC)** is responsible to the Chief of Naval Operations for oversight of USN MIW programs and, through United States Joint Forces Command (USJFCOM), for the training and readiness of MIW forces. These forces, which include AMCM, SMCM, and UCMC units as well as MCM commanders and staffs, are prepared to deploy on short notice to support any combatant command, as required. NMAWC supports these commanders in planning MCM exercises and operations.

e. **Operational Considerations.** When an enemy minefield is encountered, a number of decisions must be made. If the minefield is not on a primary SLOC or operational route, the best action may be to warn and divert shipping around the area. If the minefield is in an essential area, the decision must be made as to what type of MCM to employ. The number and types of mines, availability of MCM forces, and time will determine the type of MCM to employ. It may also be possible to counter a minefield in a critical area by sending forces over it (e.g., vertical envelopment or vertical resupply) rather than through or around it.

(1) **Integrated Operations.** Integrated MCMOPS make optimum use of all available MCM assets and tactics to meet the needs of the mission. Consideration must be given to both mutual support and mutual interference. The MCMC must consider the potential reduction of risk that could be made possible through the sequential application of an integrated force. Support from MCM helicopters may significantly reduce the risk to SMCM vessels if shallow moored mines and sensitive influence mines are swept before the SMCM employment. However, if influence sweeping is performed concurrent with EOD operations, there may be a serious risk to EOD divers in proximity as a result of sweep-generated mine detonations. The MCMC must plan operations to exploit the strong capabilities of each MCM element and schedule events to accomplish the mission in the most efficient manner consistent with the risk directive.



US Navy mine countermeasure forces during an exercise.

(2) **Multinational Force Coordination.** Many operations against enemy mining are frequently carried out by a multinational MCM effort. MCMOPS may be conducted by several national forces in close proximity. To conduct such operations safely and efficiently, agreements to coordinate operational areas and communications, as a minimum, must be established to prevent mutual interference.

(3) **Q-routes and Route Survey.** The Q-route system is a preplanned set of dormant shipping lanes that can be activated partially or totally by the area commander after it has been determined that, or before, mining has occurred. Activating Q-routes minimize the area an MCMC has to clear to provide safe passage for shipping and reduces the force required to conduct MCM. Route survey operations are conducted along Q-routes during peacetime for several purposes. First, a survey is conducted to determine if the route is favorable for minehunting. If it is not, a change of route may be recommended. Next, the established route is surveyed to collect environmental data with which to support wartime operations. The route is then periodically surveyed to locate, evaluate, and catalog minelike objects. This database can be used in conflict to determine if mining has occurred and, if it has, to reduce the time required to clear the route.

f. For additional information of maritime MCM capabilities refer to Appendix E, “Maritime Mine Countermeasure Capabilities.”

5. Control Measures and Reporting

a. **Reporting Requirements.** The MCMOPS report is used to exchange MCM tactical information between all components and joint headquarters. It provides the location and status of Service component MCMOPS, including breaching and clearing. It is also used to request, task, plan, report, modify, and approve MCMOPS, as appropriate. The report format is specified in Military Standard (MIL-STD)-6040, “US Message Text Formatting Program,” and listed in Appendix A, “Reporting.”

b. **Structured Operational General Message.** The structured operational general (OPGEN) message provides broad general guidance for operating forces. Commander, Second Fleet is responsible for issuing the standing USN-wide OPGEN. The standing USN-wide OPGEN is intended to be supplemented by numbered fleet commanders regarding mission and area of operations specifics, including issuance of fleet-level OPGEN/operation task (OPTASK) addressing unique theater characteristics, command relationships, and operational-tactical direction. It provides policy for the commanders of naval forces operating within naval, joint, or combined organizations. Prior to the commencement of an operation or exercise, the officer in tactical control will normally issue an OPGEN to the force.

c. **Structured Operation Tasking MCM and MCM Support.** The OPTASK series of structured messages provide functional warfare area (e.g., MCM, STRIKE, COMMS) specific policy and guidance. Commander, Second Fleet is responsible for issuing standing USN-wide OPTASK messages. NMAWC is responsible for preparing and submitting the USN-wide OPTASK MCM message and subsequent updates or changes to Second Fleet for approval and promulgation (NMAWC and Commander, Mobile Mine Assembly Group provide input to the standing USN-wide OPTASK STRIKE message for mining operations). The standing USN-wide OPTASK MCM is intended to be supplemented by numbered fleet commanders regarding mission and area of operations specifics, including issuance of fleet-level OPTASK MCM addressing unique theater characteristics, command relationships, and operational-tactical direction. Prior to the commencement of an operation or exercise, an OPTASK MCM will normally be issued to the MCMC by the appropriate operational control authority. When required, the MCMC will prepare an additional OPTASK MCM to provide specific information to assigned MCM forces and any supported or supporting forces.

d. **Mine Report.** The mine countermeasure report (MCMREP) is used by individual MCM organizations or a commander, task unit (CTU) to report results of MCM operations. The MCMC will specify the periodicity for MCM assets or CTUs to submit MCMREPs. They are normally required:

- (1) Upon the detection of the first mine of a differing type.
- (2) At the completion of each ordered task.
- (3) At a specified time each day.

e. The daily MCMREPs from subordinate forces are used by the MCMC to compile a consolidated summary message such as MCM situation reports. There are three versions of the MCMREP message currently in use by US MCM forces: the NATO Formatted MCMREP, the NATO Structured MCMREP, and the United States message text format (USMTF) MCMREP. The NATO Structured MCMREP and Formatted MCMREP are contained in Allied Procedural Publication (APP)-4; the US Formatted MCMREP is contained in the USMTF database. The US version of the formatted MCMREP has been significantly modified to support MEDAL-MEDAL communications.

f. Additional reports and reporting requirements for maritime mining and countermeasure can be found in NWP 3-15, *Naval Mine Warfare*.

Intentionally Blank

APPENDIX A REPORTING

1. Land Forces Reports

Once emplaced, minefields are lethal and unable to distinguish between friend and enemy. For this reason, positive control and continuous flow of information is necessary. Reporting, recording, and marking of minefields must be performed using methods that are consistent and well understood. The basic differences between conventional and scatterable mines require that they be treated differently with respect to reporting, recording, and marking.

a. **Conventional Minefield Reporting.** A minefield report is an oral, electronic, or written communication concerning mining activities, friendly or enemy. These reports document information on friendly and enemy minefields. The information is transmitted through operations channels and furnished to intelligence staff officers. It is then processed, integrated with terrain intelligence, and disseminated through intelligence channels to affected units. Mandatory conventional minefield reports are:

- (1) Report of intention.
- (2) Report of initiation.
- (3) Report of completion.

b. These reports will be submitted by the emplacing unit commanders through operations channels to the operations officer (J-3, CJ-3 or G-3) of the authorizing headquarters. That headquarters will integrate the reports with terrain intelligence and disseminate them through tactical intelligence. The reports should be sent by secure means.

(1) **Report of Intention.** The report of intention is made as soon as it is decided to lay the minefield. It doubles as a request when initiated at levels below those with authority to emplace. This report, when required, includes the following required data Standardization Agreement (STANAG) 2036 on the proposed minefield:

- (a) Tactical purpose.
- (b) Type of minefield.
- (c) Estimated number and types of mines.
- (d) Whether mines are surface laid or buried.
- (e) Whether antihandling devices are used.
- (f) Location of minefield.

- (g) Location and width of lanes and gaps.
- (h) Proposed date and time for starting and completing.

Conventional minefields which are part of an operation or general defense plan that has been approved by the authorizing commander do not require a report of intention. Their inclusions in such a plan implies an intention to lay.

(2) **Report of Initiation.** The report of initiation is a mandatory report made by the laying unit when installation begins. It informs higher headquarters that emplacement has begun and the area is no longer safe for friendly movement and maneuver.

(3) **Report of Completion.** The report of completion is usually an oral report to the authorizing commander that the minefield is complete and functional. The report of completion is followed as rapidly as possible by the completed DA Form 1355 (Minefield Record) or DA Form 1355-1-R (Hasty Protective Minefield Record). Completion of the minefield records is the responsibility of the laying unit.

c. **Scatterable Minefield Reporting.** Accurate, timely, and uniform reporting and dissemination of scatterable minefield emplacement information is a must. Fluid and fast-moving tactical situations require that complete information on scatterable mine employment be known and passed on in a simple, rapid manner to all units that could be affected. The variety of emplacing systems and emplacing units preclude the use of locally devised reporting and dissemination methods. Scatterable minefields must also be recorded to facilitate clearing. They need not be recorded in the detail required when emplacing conventional mines, since the locations of individual scatterable mines are unknown. Shown below is a relatively simple reporting procedure that will be used for scatterable mines. It is applicable for all delivery systems and can be sent in a voice, digital, or hard copy mode.

(1) **Scatterable Minefield Report and Record Form (Front Side)**

LINE #	INFORMATION REQUIRED	DATA - INST ON BACK
1	APPROVING AUTHORITY	
2	TGT/ OBSTACLE #	
3	TYPE EMPLACING SYSTEM	
4	TYPE MINES	
5	SELF-DESTRUCT PERIOD	
6	AIM PT/CORNER PTS OF MINEFIELD	
7		
8		
9		
10		
11		
12		
13		

14	
15	SIZE SAFETY ZONE FROM AIM PT
16	UNIT EMPLACING MINES/RPT #
17	PERSON COMPLETING RPT
18	DTG OF REPORT
19	REMARKS

(2) Scatterable Minefield Report and Record Form (back side)

LINE # INSTRUCTIONS

- 1 Approving Authority.** Enter approving authority. CDR 3AD
- 2 Target/Obstacle Number.** If the minefield is part of an obstacle plan, enter the obstacle number 2XXX0157. This number represents 11 Corps, target number 157. If the minefield is not a part of an obstacle plan or does not have a number, then leave blank or enter NA.
- 3 Type Emplacing System.** Enter the type system that emplaced the minefield, such as ARTY, Volcano.
- 4 Type Mines.** Enter AP for antipersonnel mines, AT for antitank mines. If both, enter AP/AT.
- 5 Self-Destruct Period.** Enter the time period in which the minefield will self-destruct.
- 6-14 Aim Point/Corner Points of the Minefield.** If the system used to emplace the minefield uses a single aim point to deliver the mines, enter that aim point MB 10102935. If the system has distinct corner points such as Volcano, enter those corner points MB 17954790, MB 18604860, MB 18504890, MB 18054895, MB 17804850.
- 15 Size Safety Zone from Aim Point.** If an aim point is given in Line 6, enter the size safety zone from that aim point. Example: Artillery emplaces a minefield from aim point MB 10102935 and the safety zone is 1,000M x 1,000M, enter 500M so that personnel plotting or receiving the information can plot the coordinate and go 500M in each direction from the aim point and plot the safety zone.
- 16 Unit Emplacing Mines and Report Number.** BCO 23ENGB BN 4. Reports should be numbered consecutively. This would be the fourth minefield that B Company has emplaced.
- 17 Person Completing the Report.** SFC Hollind
- 18 Date-Time Group of Report.** 160735Z OCT96
- 19 Remarks.** Any other items the reporting unit may feel are important.

(3) Scatterable Minefield Report and Record Form (Sample)

LINE #	INFORMATION REQUIRED	DATA	INST ON BACK
1	APPROVING AUTHORITY	2BDE3AD	
2	TGT / OBSTACLE #	NA	
3	TYPE EMPLACING SYSTEM	Volcano	
4	TYPE MINES	AT/AP	
5	SELFDESTRUCT PERIOD	101630Z-102130Z OCT96	
6	AIM PT/CORNER PTS OF MINEFIELD		
7		MB 17955490	
8		MB 18604860	

9 MB 18504890
 10 MB 18054895
 11 MB 17804850
 12
 13
 14
 15 SIZE SAFETY ZONE FROM AIM PT NA
 16 UNIT EMPLACING MINES/RPT# BC023ENGR/4
 17 PERSON COMPLETING RPT 1LT JENNINGS
 18 DTG OF REPORT 051400ZOCT96
 19 REMARKS MINEFIELD AROUND TANK DITCH

(4) Scatterable Minefield Warning (SCATMINEWARN)

Units which may be affected by the emplacement of scatterable mines will need to receive a warning to alert them. This warning message may be disseminated prior to or after the mines are emplaced. Only the very basic information should be included to prevent tie up of communication systems. The following procedure is a convenient, easily sent message which provides the necessary information.

SCATMINEWARN Report

LINE	MESSAGE
ALPHA	Emplacing System.
BRAVO	AT YES/NO
CHARLIEAP	YES/NO
DELTA	# aim points/corners points.
ECHO	Grid coordinates of aim points and/or corner points and size safety zone.
FOXTROT	DTG of self-destruct period.

Examples of a warning message based upon the previous Scatterable Minefield Report and Record are as follows:

SCATMINEWARN (Example 1)
 ALPHA ARTY
 BRAVO *Yes*
 CHARLIE *Yes*
 DELTA *One*
 ECHO *MB 10102935 500M*
 FOXTROT *081610Z-081900ZOCT96*

SCATMINEWARN (Example 2)
 ALPHA *Volcano*
 BRAVO *Yes*
 CHARLIE *Yes*
 DELTA *Five*
 ECHO *MB 17954790*
 MB 18604860
 MB 18504890
 MB 18054895
 MB 17804850
 FOXTROT *101630Z-102130ZOCT96*

(5) Enemy Minefield Reporting and Recording

Any detection, encounter, or knowledge of enemy minefields or mining activities must be reported by the fastest reliable means. The report is made to the next higher commander, and must include all known information about the minefield. The report is normally made through operation channels. Specific information is outlined in STANAG 2096 and is as follows:

LINE	INFORMATION
ALPHA	Map sheet designation
BRAVO	Date and time of collection of information
CHARLIE	Type of minefield (AT, AP) (self-destructing)
DELTA	Coordinates of minefield extremities
ECHO	Depth of minefield
FOXTROT	Enemy weapons or surveillance
GOLF	Estimated time to breach minefield
HOTEL	Estimated material and equipment needed to breach minefield
INDIA	Routes for bypassing minefield (if any)
JULIET	Coordinates of lane entry (if any)
KILO	Coordinates of lane exit (if any)
LIMA	Width of lanes, in meters (if any)
ZULU	Other

(6) UXO Spot Report

The UXO SPOTREP is a detailed, swift, two-way reporting system that makes clear where the UXO hazard areas are, what their priorities are, and which units are affected by them. The report is used to request help in handling a UXO hazard that is beyond a unit's ability to handle and that affects the unit's mission. This report helps commanders set priorities based on the battlefield situation. The UXO SPOTREP is the first-echelon report that is sent when a UXO is encountered. The report consists of nine lines and is sent by the fastest means available.

LINE #	INFORMATION
1.	Date-Time Group: DTG item was discovered
2.	Reporting Activity: (Unit identification code) and location (grid of UXO).
3.	Contact Method: Radio frequency, call sign, point of contact and telephone number.
4.	Type of Ordnance: Dropped, projected, placed or thrown. If available, supply the subgroup. Give the size of the hazard area.
5.	CBRN Contamination: Be as specific as possible.
6.	Resources Threatened: Report any equipment, facilities, or other assets that are threatened.
7.	Impact on Mission: Provide a short description of current tactical situation and how the presence of UXO affects mission.
8.	Protective Measures: Describe any measures you have taken to protect personnel and equipment.
9.	Recommended Priority: Recommend a priority for response by EOD or engineers.

(7) US Message Text Format Messages:

UNCLASSIFIED MIL-STD-6040

5.1.1 MESSAGE TEXT FORMATS

IMPL DATE: 1 JANUARY 1997

(U) INDEX REFERENCE NUMBER: C114 STATUS: AGREED DAT

MTF IDENTIFIER: SIREP

MESSAGE TEXT FORMAT NAME: SENSITIVE INFORMATION REPORT

FUNCTION OR PURPOSE: THE SIREP IS USED TO PROVIDE SENSITIVE INFORMATION ON EVENTS OR CONDITIONS THAT MAY HAVE A SIGNIFICANT IMPACT ON CURRENT PLANNING OF AN OPERATION, BUT OF LESS TIME CRITICALITY THAN A TACREP. THIS MESSAGE PROVIDES A SENSITIVE FILE MAINTENANCE UPDATE MECHANISM.

SPONSORS: DIA

RELATED DOCUMENTS:

MESSAGE TEXT FORMAT:

<u>SEG</u>	<u>RPT</u>	<u>OCC</u>	<u>SETID</u>	<u>SEQ</u>	<u>FIELD OCCURRENCE</u>	<u>SET FORMAT NAME</u>
	(C)		EXER	1	/M/O//	EXERCISE IDENTIFICATION
	(0)		OPER	2	/M/O/O/O//	OPERATION IDENTIFICATION DATA
	(M)		MSGID	3	/M/M/O/O/O/O//	SIREP
	(0)		REF	4	/M/M/M/M/O/O/*O//	REFERENCE
	(C)		AMPN	5	M//	AMPLIFICATION
	(C)		NARR	6	/M//	NARRATIVE INFORMATION
	(0)		COLINFO	7	/O/O/O/O//	COLLECTOR INFORMATION
	(C)		HEADING	8	/M//	GROUND ACTIVITY
	(C)		IEUNITEQ	9	/*M/M/M/M//	ENEMY UNIT AND EQUIPMENT
	(0)		IESTATUS	10	/*M/M/M/M/M/M//	ENEMY STATUS AND ACTIVITY INFORMATION

(0)	IEEMTLOC	11	/*M/M/M/M/M/M//	LAST KNOWN ENEMY EMITTER LOCATION
(0)	2EDESTIN	12	/*M/M/M//	ENEMY DESTINATION INFORMATION
(C)	GENTEXT	13	/M/M//	GROUND ACTIVITY SUMMARY
(C)	HEADING	14	/M//	AIR ACTIVITY
(C)	2EACSTAT	15	/*M/M/M/M/M/M//	ENEMY AIRCRAFT STATUS
(0)	2EACLOC	16	/*M/M/M/M/M/M/M//	ENEMY AIRCRAFT LOCATION AND MOVEMENT INFO
(0)	2EACORD	17	/*M/M/M//	ENEMY AIRCRAFT ORDNANCE AND DESTINATION
(0)	2EDESTIN	18	/*M/M/M//	ENEMY DESTINATION INFORMATION
(C)	GENTEXT	19	/M/M//	AIR ACTIVITY SUMMARY
(C)	HEADING	20	/M//	MARITIME ACTIVITY
(C)	3MTGTQNT	21	/*M/M/M/M/M/M/M//	MARITIME TARGETS, QUANTITY AND TYPE
(0)	3MTGTDSG	22	/*M/M/M/M/M//	MARITIME TARGET DESIGNATION
(0)	3MTGTLOC	23	/*M/M/M/M/M/M//	MARITIME TARGET LOCATION INFORMATION
(0)	3MTGTINF	24	/*M/M/M/O/M/M/M//	MARITIME TARGET INFORMATION
(0)	3MTGTACT	25	/*M/M/M/M//	MARITIME TARGET DESTINATION AND/ OR ACTIVITY
(C)	GENTEXT	26	/M/M//	MARITIME ACTIVITY SUMMARY
(0)	GENTEXT	27	/M/M//	ENEMY COMMUNICATIONS ACTIVITY
(C)	HEADING	28	/M//	ENEMY LOSSES
(0)	ENLOS	29	/M/M/M/M/M/M/M//	ENEMY PERSONNEL LOSS COUNT

Appendix A

(0)	ICAPEQ	30	/*M/M/M/M//	COUNT OF EQUIPMENT CAPTURED
(C)	4DESEQ	31	/*M/M/M/M//	COUNT OF EQUIPMENT DESTROYED
(C)	4DAMEQ	32	*M/M/M/M//	COUNT OF EQUIPMENT DAMAGE
(C)	1ABANDEQ	33	/*M/M/M/M//	COUNT OF EQUIPMENT ABANDONED
(C)	GENTEXT	34	/M/M//	ENEMY LOSS SUMMARY
(C)	HEADING	35	/M//	FRIENDLY LOSSES
(0)	FRLOS	36	/M/M/M/M/M/M/M//	FRIENDLY PERSONNEL LOSS COUNT
(0)	CAPEQ	37	/*M/M/M/M//	COUNT OF EQUIPMENT CAPTURED
(C)	4DESEQ	38	/*M/M/M/M//	COUNT OF EQUIPMENT DESTROYED
(C)	4DAMEQ	39	/*M/M/M/M//	COUNT OF EQUIPMENT DAMAGE
(C)	GENTEXT	40	/M/M//	FRIENDLY LOSS SUMMARY
(C)	HEADING	41	/M//	BARRIERS AND OBSTACLES
(0)	1BARRIER	42	/*M/M/M//	BARRIER OR OBSTACLE INFORMATION
(C)	HEADING	43	/M//	INSTALLATION DATA
(0)	7TGTTYPE	44	/*M/M/M/M/M//	TARGET TYPE, STATUS AND/OR LOCATION INFO
(C)	7AREANAM	45	/*M/M//	AREA NAME
(0)	GENTEXT	46	/M/M//	INSTALLATION ACTIVITY
(C)	HEADING	47	/M//	PERSONALITIES
(0)	8EPERDAT	48	/*M/M/M/M/M//	ENEMY PERSONNEL PERSONAL DATA

(0) DECL 49 /M//

MESSAGE
DOWNGRADING OR
DECLASSIFICATION
D.

STRUCTURAL NOTATION:

1. (1) P ([2] e)
2. (3)F1 A "SIREP"
3. (5) M (([4]F2 = FF6461) L ([4] Q= 1))
4. (6) M (([4] e> 1) ~ ([4],NF2 = FF6461))
5. (8) MP ([9] e)
6. (8)F1 A "GROUND ACTIVITY"
7. (9) M (([10] 8) / ([11] D) / ([12] 0))
8. (10)F1 = [9]F1,N
9. (11)F1 = [9]F1,N
10. (12)F1 = [9]F1,N
11. (13) M ([9] 8)
12. (13)F1 A "GROUND ACTIVITY SUMMARY"
13. (14) MP ([15] S)
14. (14)F1 A "AIR ACTIVITY"
15. (15) M (([16] 8) / ([17] @) / ([18] 8))
16. (16)F1 = [15]F1,N
17. (17)F1 = [15]F1,N

UNCLASSIFIED

FOR OFFICIAL USE ONLY MIL-STD-6040

5.1.1 MESSAGE TEXT FORMATS

IMPL DATE: 1 JANUARY 1997

(OU) INDEX REFERENCE NUMBER: C327 STATUS: AGREED D

MTF IDENTIFIER: MCMREP

MESSAGE TEXT FORMAT NAME: MCM REPORT

FUNCTION OR PURPOSE: THE MCMREP PROVIDES A SITUATION REPORT ON MCM OPERATIONS AND THE AREA IMPACTED BY PRESENT OR FUTURE MCM OPERATIONS.

SPONSORS:

RELATED DOCUMENTS: FOR FURTHER US IMPLEMENTATION GUIDANCE, SEE JIEO CIRCULAR 9152, ITEMS 42 AND 51.

MESSAGE TEXT FORMAT:

<u>SEG</u>	<u>RPT</u>	<u>OCC</u>	<u>SETID</u>	<u>SEQ</u>	<u>FIELD OCCURRENCE</u>	<u>SET FORMAT NAME</u>
		(C)	EXER	1	/M/O//	XERCISE IDENTIFICATION(0)
		(O)	OPER	2	/M/O/O/O//	OPERATION IDENTIFICATION DATA
		(M)	MSGID	3	/M/M/O/O/O/O/ /	MCMREP
*		(O)	REF	4	/M/M/M/M/O/O/*O//	REFERENCE
		(C)	AMPN	5	/M//	AMPLIFICATION
		(C)	NARR	6	/M//	NARRATIVE INFORMATION
*		(O)	MXPN	7	/M/M/O/O/O/O/O//	MINE EXPLOSION
		(O)	MDETDAT	8	/0/0/0/0/0/0//	MINE DETECTION DATA
*		(O)	MOPS	9	/M/O//	MCM OPERATIONS IN PROGRESS
		(O)	MTASK	10	/M/M/O/*O/O//	MCM TASK
*		(O)	MINE	11	/M/O/O/O/O/O/O//	MINE INFORMATION
*		(O)	MSUM	12	/M/O//	SUMMARY OF MINEFIELDS
*		(O)	MTYPE	13	/M/O//	TYPE OF MINE
		(O)	PGRSS	14	/M/O/O/O/O/O/O/O/O/O/*O//	PROGRESS OF MCM TASK
*		(O)	NOOP	15	/M/O/O/O//	SHIPS NONOPERATIONAL
*		(O)	UWCOND	16	/M/O/O/O/O/O/O/O/O//	UNDERWATER CONDITIONS
		(O)	CONM~RK	17	/M/O/O/O//	CONTACT MARKER
		(O)	MZONE	18	/M/M/M/*O/O//	STATUS OF MINE ZONE
		(C)	AMPN	19	/M//	AMPLIFICATION
*		(M)	MBUOY	20	/M/O/O/O/O//	MCM BUOY
		(O)	MAP	21	/M/O/*O/O/O//	MAP DATA INFORMATION
		(O)	LOGSIT	22	/0/0/0/0/0/0//	LOGISTICS SITUATION
		(O)	ASORT	23	/0/0/0/0/0/0/0/0/0//	AIR SORTIE
		(C)	AMPN	24	/M//	AMPLIFICATION
		(O)	ASUM	25	/0/0/0/0//	AIR SUMMARY
		(O)	DIVDAT	26	/0/0/0/0/0//	DIVER DATA
		(O)	ENVIRN	27	/0/0/0/0//	ENVIRONMENT
		(O)	CHRON	28	/0/0/0/0/0/0/0/0//	CHRONOLOGY
		(O)	NAV	29	/O/O/O//	NAVIGATION

(C)	AMPN	30	/M//	AMPLIFICATION
(0)	AKNLDG	31	/M/*O//	ACKNOWLEDGMENT REQUIREMENT
(0)	DECL	32	/M//	MESSAGE DOWNGRADING OR DECLASSIFICATION D.

STRUCTURAL NOTATION:

1. (1) P ([2] @)
2. (3)F1 A "MCMREP"
3. (5) M (([4]F2 = FF6461) & ([4] e= 1))
4. (6) M (([4] e> 1) & ([4],NF2 = FF6461))
5. (19) M ([18]F3 = "CLOSED")
6. (24) M ([23]F2 = "99")
7. (30) M ([29]F2 = "99")

NATURAL LANGUAGE EQUIVALENT:

1. SET 1 (EXER) IS PROHIBITED, IF SET 2 (OPER) OCCURS.
2. SET 3 (MSGID) FIELD 1 MUST EQUAL "MCMREP."
3. SET 5 (AMPN) IS MANDATORY, IF [SET 4 (REF) FIELD 2 EQUALS FFIRN/FUD 646-1 AND THE NUMBER OF OCCURRENCES OF SET 4 (REF) EQUALS 1].
4. SET 6 (NARR) IS MANDATORY, IF [THE NUMBER OF OCCURRENCES OF SET 4 (REF) IS GREATER THAN 1 AND FIELD 2 IN SOME OCCURRENCE OF SET 4 (REF) EQUALS FFIRN/FUD 6461].
5. SET 19 (AM~N) IS MANDATORY, IF SET 18 (MZONE) FIELD 3 EQUALS "CLOSED."
6. SET 24 (AMPN) IS MANDATORY, IF SET 23 (ASORT) FIELD 2 EQUALS "99."
7. SET 30 (AMPN) IS MANDATORY, IF SET 29 (NAY) FIELD 2 EQUALS "99."

REMARKS:

THE PAGE MARKINGS ARE IN ACCORDANCE WITH THE RELATED DOCUMENT FOR THE AGGREGATE MESSAGE TEXT FORMAT.

REVISION DATE: 21 JUL 1995
FOR OFFICIAL USE ONLY
UNCLASSIFIED MIL-STD-6040
5.1.1 MESSAGE TEXT FORMATS
IMPL DATE: 1 JANUARY 1997

(U) INDEX REFERENCE NUMBER: C440 STATUS: AGREED DAT

MTF IDENTIFIER: MINEOPS

MESSAGE TEXT FORMAT NAME: JOINT MINELAYING OPERATIONS

FUNCTION OR PURPOSE: THE MINEOPS IS USED FOR THE JOINT EXCHANGE OF INFORMATION ON THE LOCATION, CHARACTERISTICS, AND STATUS OF COMPONENT SERVICES' MINELAYING OPERATIONS. IT IS ALSO USED TO REQUEST, TASK, MODIFY, REPORT, PLAN, AND APPROVE MINELAYING OPERATIONS.

SPONSORS: USN/USAF

RELATED DOCUMENTS:

MESSAGE TEXT FORMAT:

<u>SEG</u>	<u>RPT</u>	<u>OCC</u>	<u>SETID</u>	<u>SEQ</u>	<u>FIELD OCCURRENCE</u>	<u>SET FORMAT NAME</u>
		(C)	EXER	1	/M/O//	EXERCISE
		(O)	OPER	2	/M/O/O/O//	IDENTIFICATION OPERATION IDENTIFICATION DATA
		(M)	MSGID	3	/M/M/O/O/O/O//	MINEOPS
	*	(O)	REF	4	/M/M/M/M/O/O/*O//	REFERENCE
		(C)	AMPN	5	/M//	AMPLIFICATION
		(C)	NARR	6	/M//	NARRATIVE INFORMATION
M		(M)	MWACT	7	/M//	MINE WARFARE OPERATIONS ACTIVITY
[O		(M)	MINEFLD	8	/M/M/M/M/M/*M//	MINEFIELD INFORMATION
[[	*	(O)	MAP	9	/M/O/*O/O/O//	MAP DATA INFORMATION
[[		(C)	POMOE	10	/M/M/M/M/M/M/O/O/O/O/O//	PLANNED OVERALL MEASURE OF EFFECTIVENESS
[[		(M)	5TIME	11	/*M/M/M/M/M/M/M/O/C//	MINEFIELD TIME AND STATUS INFORMATION
[[		(O)	5MFLD	12	/*M/M/M/O/O/O/C/O//	MINEFIELD INFORMATION

[[	*	(0)	MDELTYP	13	/M/M/M/M//	MINE DELIVERY AND TYPE
[[	*	(0)	UNITDES	14	/M/M/M/O//	MINELAYING UNIT DESIGNATOR INFORMATION
[[		(0)	5MLINE	15	/*M/M/M/M/M/M/	MINELINES
[[		(0)	5MLOC	16	/*M/M/M/O/C//	MINE LOAD LOCATION
[[	*	(C)	MCPOS	17	/M/M/M/M/M/M/O//	MINE CASE AND POSITION
[						END OF SEGMENT END OF SEGMENT
		(0)	DECL	18	/M//	MESSAGE DOWNGRADING OR DECLASSIFICATION D.

STRUCTURAL NOTATION:

1. (1) P ([2] @)
2. (3) F1 A "MINEOPS"
3. (5) M (([4]F2 = FF6461) & ([4] Q= 1))

UNCLASSIFIED UNCLASSIFIED MILSTD6040
5.1.1 MESSAGE TEXT FORMATS
IMPL DATE: 1 JANUARY 1997

(U) INDEX REFERENCE NUMBER: C441 STATUS: AGREED

MTF IDENTIFIER: MCMOPS

MESSAGE TEXT FORMAT NAME: JOINT MINE COUNTERMEASURES
OPERATIONS

FUNCTION OR PURPOSE: THE MCMOPS IS USED FOR THE JOINT EXCHANGE OF INFORMATION ON THE LOCATION AND STATUS OF COMPONENT SERVICES MINE COUNTERMEASURES (MCM) OPERATIONS. IT IS ALSO USED TO REQUEST, TASK, PLAN, REPORT, MODIFY, AND APPROVE MINE COUNTERMEASURES OPERATIONS.

SPONSORS: USN/USAF

RELATED DOCUMENTS:

MESSAGE TEXT FORMAT:

<u>SEG</u>	<u>RPT</u>	<u>OCC</u>	<u>SETID</u>	<u>SEQ</u>	<u>FIELD OCCURRENCE</u>	<u>SET FORMAT NAME</u>
		(C)	EXER	1	/M/O//	EXERCISE IDENTIFICATION
		(0)	OPER	2	/M/O/O/O//	OPERATION IDENTIFICATION DATA
	*	(M)	MSGID	3	/M/M/O/O/O/O//	MCMOPS
		(0)	REF	4	/M/M/M/M/O/O/*O//	REFERENCE
		(C)	AMPN	5	/M//	AMPLIFICATION
		(C)	NARR	6	/M//	NARRATIVE INFORMATION
M		(M)	MWACT	7	/M//	MINE WARFARE OPERATIONS ACTIVITY
[M		(M)	MCMACT	8	/M/M/M/M/O/O/O/O/O/O/*O//	MINE COUNTERMEASURES ACTIVITY
[[	*	(0)	MAP	9	/M/O/*O/O/O//	MAP DATA INFORMATION
[[	*	(C)	VESVEH	10	/M/M/*M/M//	VESSEL/VEHICLE IDENTIFICATION
[[	*	(0)	MDA	11	/0/*0/0//	MINE DANGER AREA
[[	*	(0)	SAFELANE	12	/M/M/M/M/M/O/*M//	LANE OF SAFE PASSAGE
[[	*	(0)	LDTHCORD	13	/M/M/M/*M//	LEAD-THROUGH COORDINATION
[						END OF SEGMENT
[		(0)	DECL	14	/M//	END OF SEGMENT MESSAGE DOWNGRADING OR DECLASSIFICATION D.

STRUCTURAL NOTATION:

1. (1) P ([2] @)
2. (3)F1 A "MCMOPS"
3. (5) M (([4]F2 = FF6461) & ([4] Q= 1))
4. (6) M (([4] @> 1) & ([4],NF2 = FF6461))
5. (10) M ([12] @)

NATURAL LANGUAGE EQUIVALENT:

UNCLASSIFIED

2. Maritime Mine Countermine Reporting

MCM operations require a variety of reports and directives, including formatted, structured, and visual or voice messages. Reporting procedures usually require successively higher levels of command to collate reports from subordinate units for further submission of consolidated reports. The vast majority of MCM messages are contained in the following publications.

a. **USMTF.** The USMTF database contains all formatted messages used by US military forces. MCM messages contained in the database are the MCMREP and the OPTASK MCM. Mining messages contained in the file are the OPTASK MINING and the mine laying report (MLAYREP). The formats in USMTF are unclassified and have been released to many allied and coalition nations. Whenever possible, available message drafting software should be used to ensure the accuracy of USMTF messages.

b. **APP-4, *Allied Formatted and Structured Messages.*** APP-4 is a NATO publication that contains all formatted and structured messages used by naval forces within NATO. Formatted MCM messages contained in the database are the MCMREP and the OPTASK MCM. Formatted mining messages contained in the file are the OPTASK MINING and the MLAYREP. The formats in the APP-4 supporting database (AdatP-3) are currently NATO-CONFIDENTIAL and can only be used when operating with other NATO nations.

c. **Allied Tactical Publication (ATP)-1, Vol. II, *Allied Maritime Tactical Instructions and Procedures.*** ATP-1, Vol. II is a NATO publication that contains all visual and voice signals used by NATO forces. A MIW signal is frequently referred to phonetically as “Mike Whiskey” because it is contained in the tab marked “MIW.” The Mike Whiskey signals can also be sent as record messages. The formats in ATP-1, Vol. II are currently NATO-CONFIDENTIAL and can only be used when operating with other NATO nations.

d. **Marine Tactical Publication 6 Volume II, *Naval Mine Countermeasures Operations Planning and Evaluation*, and Marine Tactical Publication 24 Volume I, *Naval Mine Countermeasures Tactics and Execution*,** is a NATO-UNCLASSIFIED publication developed for conducting MCM operations with Partnership for Peace and other non-NATO nations. It contains releasable versions of various MCM reports taken from classified NATO publications.

e. The following guidelines are used to determine which reports should be specified:

(1) US report formats should be used when all assigned forces are US only. The MCMC can elect to use NATO or Marine Tactical Publication 6 Volume II, *Naval Mine Countermeasures Operations Planning and Evaluation*, and Marine Tactical Publication 24 Volume I, *Naval Mine Countermeasures Tactics and Execution*, formats during US-only exercises if those exercises are designed to prepare for operations with NATO or other allied forces.

(2) NATO report format should be used when all assigned forces are with NATO.

(3) Marine Tactical Publication 6 Volume II, *Naval Mine Countermeasures Operations Planning and Evaluation*, and Marine Tactical Publication 24 Volume I, *Naval Mine Countermeasures Tactics and Execution*, report formats should be used when assigned forces include non-NATO forces. The MCMC can elect to use US report formats if they have been released to all participating nations.

APPENDIX B

LAND MOBILITY CAPABILITIES

1. Operational Environment

The operational environment includes significant challenges to both mobility and maneuver. Within the threat dimension, potential adversaries span the spectrum from modern heavy conventional forces to unconventional forces employing asymmetric means. Potential challenges to maneuver range from conventional obstacles and mines employed in depth to booby traps, and other EHs employed in improvised and adaptive attacks. Adversaries may seek refuge in terrain that by its nature and remoteness challenges maneuver. They will use complex terrain and urban areas to disperse US and multinational forces and limit many of our capabilities. Support to movement and maneuver tends to be focused at the tactical and lower operational levels in support of combat maneuver. It is primarily related to forces operating on land. Mobility support is applicable at all echelons and for all military forces. The focus of this appendix is on providing a concise discussion of enemy countermobility capabilities and their employment of land mines and other explosive hazards. It includes a discussion of the US units and potential capabilities to provide mobility and support to movement and maneuver against these countermobility capabilities.

a. **Land Mines.** Whether buried conventionally in patterns, laid on the surface in seemingly random fashion, or intentionally scattered; land mines will likely be present in prolific numbers on the battlefield. Potential adversaries with conventional military capabilities will employ large numbers of land mines to offset our maneuver advantages. Highly developed adversaries may employ large numbers of SCATMINES. Less developed adversaries are likely to employ more conventional mines and other EHs in lieu of conventional mines or SCATMINES. Terrorists will obtain and employ land mines in any manner possible to inflict losses on our friendly forces as well as noncombatants. Their most likely choice will be EHs to include IEDs rather than mines, but their use of mines remains a very real possibility. The numbers and types of land mines available to potential adversaries are extensive and include AT and AP mines with numerous types of firing mechanisms (see FM 3-34.210, *Explosive Hazards Operations*; TC 20-32-3, *Foreign Mine Handbook [Balkan States]*; TC 20-32-4, *Foreign Mine Handbook [Asia]*; TC 20-32-5, *Commander's Reference Guide: Land Mine and Explosive Hazards [Iraq]*). Conventional employment of mines will typically be integrated with other obstacles such as wire and tank ditches to create complex obstacles.

b. **Explosive Hazards.** An EH is any hazard containing an explosive component. FMI 3-34.119/MCIP 3-17.01, *Improvised Explosive Device (IED) Defeat*, describes EHs currently encountered on the battlefield in five categories: UXO (including land mines), booby traps (some booby traps are nonexplosive), IEDs, captured enemy ammunition (CEA), and bulk explosives. Information in this manual focuses on the enemy's employment of EHs as a direct challenge to friendly freedom of maneuver. **IEDs and UXO are the two types of EHs that are of greatest concern for movement and maneuver.**

See FM 3-34.210, Explosive Hazards Operations, for additional supporting information.

(1) **The Improvised Explosive Device System.** IEDs are not a new phenomenon, but recent use of IEDs has greatly expanded the methods in which they are used and the types of materials used to create them, which poses an increasing challenge to our freedom of maneuver. The improvised version can be almost anything containing explosive material and initiator. It is an improvised device that is designed to cause death or injury by using explosives alone or in combination with other materials—to include projectiles, toxic chemicals, biological toxins, or radiological material. IEDs can be produced in varying sizes, functioning methods, containers, and delivery methods. Commercial or military explosives, homemade explosives, or military ordnance and ordnance components can be used to make them. IEDs are primarily conventional high-explosive charges, also known as homemade bombs. A chemical and biological agent, or even radiological material, may be included to add to the destructive power and the psychological effect of the device. They are unique because the IED builder has had to improvise with the materials at hand. Designed to defeat a specific target or type of target, they generally become more difficult to detect and protect against as they become more sophisticated. The sophistication of IEDs varies greatly from a crude design fabricated from common materials to premanufactured kits, and ranging in size from a cigarette pack to a large vehicle. IEDs can be detonated in numerous ways including radio control, heat/sound/motion sensor, command wire, and victim initiated. The degree of sophistication depends on the ingenuity of the designer and the tools and materials available. Cached, stockpiled munitions within the theater of operations may provide the explosive materials to “would be” enemy bombers.

(2) **Unexploded Explosive Ordnance.** 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 fully functioned or detonated and are hazards. UXO poses the risk of injury or death to personnel but also can pose a challenge to maneuver along a key route or within a significant area.

See FM 3-100.38/MCRP 3-17.2B/NTTP 3-02.4.1/AFTTP(I) 3-2.12, Multi-Service Tactics, Techniques, and Procedures For Unexploded Explosive Ordnance Operations, and FM 4-30.16/MCRP 3-17.2C/NTTP 3-02.5/AFTTP(I) 3-2.32, Multi-Service Tactics, Techniques, and Procedures For Explosive Ordnance Disposal In a Joint Environment.

2. Staff Integration for Support to Movement and Maneuver

Each maneuver force echelon down to the BCT and the RCT level has organic staff capability (engineers, military police (MP), chemical, biological, radiological, and nuclear [CBRN], and others such as EOD when augmented) to integrate their collective combat support (CS) mobility capabilities into the combined arms fight. These CS planners are the primary members of the battle staff responsible for understanding and integrating mobility capabilities to support movement and maneuver. Those capabilities may be organic to or augment the maneuver force. These staff members synchronize their collective capabilities to support the needs of the maneuver commander and enable movement and maneuver for the force.

3. Mobility Units and Capabilities

a. Army

(1) **Organic Mobility Units and Capabilities.** The Army is a brigade-based force. The major combat and support capabilities a brigade needs for most operations are organic to its structure. Each BCT has one or more organic combat engineer companies, whose primary focus is supporting combined arms mobility operations. Other engineer elements in the BCT include a terrain team and engineer planners. See JP 3-34, *Joint Engineer Operations*, for more information about these units and their capabilities. Other mobility support assets within the BCT include reconnaissance elements and, in some cases, MP platoons. Additional information on the structure of each of the BCTs and their subordinate units can be found in FM 3-90.6, *Heavy Brigade Combat Team*, and FM 3-90.61, *Brigade Special Troops Battalion*. Additional information on the capabilities and structure of the organic combat engineers can be found in FM 3-34, *Engineer Operations*, and FM 3-34.22, *Engineer Operations - Brigade Combat Team and Below*.

(2) **Augmenting Mobility Units and Capabilities.** The organic structure of the BCT does not include all the combat engineer mobility support needed to conduct mobility operations. The BCT has organic engineer elements as shown previously in this appendix, but may need additional breaching, clearing, gap crossing, or other selected capabilities based on mission requirements. The BCT commander and staff must identify and address required capability shortfalls through augmentation.

(a) **Engineer Augmentation.** Organic engineer capability within the BCTs will require augmentation to support mobility operations. There is no organic gap crossing capability in the heavy brigade combat team (HBCT) or infantry brigade combat team (IBCT) and the Stryker brigade combat team (SBCT) has only limited organic gap crossing capability. The engineer force pool includes engineer units not organic to a BCT or embedded in a headquarters staff. For combined arms breaching operations; the BCT will generally require augmentation of one or two mobility augmentation companies, a sapper company, and at least one route clearance platoon. The type and number of augmentation units required will vary with METT-T. For a gap crossing operation; the BCT would require the augmentation listed above plus at least one multi-role bridge company. In clearance operations; the BCT may be augmented by numerous clearance and sapper elements (and perhaps a mine dog detection team). Engineer units and capabilities likely to augment the BCT in mobility operations include the sapper company, mobility augmentation company, clearance company, engineer support company, explosive hazards coordination cell (EHCC), and engineer mine dog detection unit. For more information about these units, see JP 3-34, *Joint Engineer Operations*. Army, Marine Corps, and Navy units may form engineer reconnaissance teams (ERTs). An ERT is not an engineer unit but rather an engineer capability. The current engineer force structure does not provide for engineer personnel or equipment dedicated to reconnaissance efforts. However, experience has shown that employment of engineers in a reconnaissance role enhances the effectiveness of reconnaissance in support of mobility operations. Because an engineer unit has limited assets to draw from, the formation of ERTs can subsequently degrade the capabilities of the organization from which they are drawn. The commander must understand the trade-offs between using engineer assets in a reconnaissance role versus using them in other roles.

(b) **Other Mobility Support Augmentation**

1. **EOD** units provide the capability to neutralize hazards from conventional UXO, IED, chemical, biological, radiological, nuclear, and high-yield explosives, and associated materials that present a threat to operations, installations, personnel, and/or material. EOD forces also may dispose of hazardous foreign or US ammunition, UXO, individual mines, booby-trapped mines, and chemical mines. EOD forces serve as a combat multiplier by neutralizing UXO that is restricting freedom of movement and denying access to supplies, facilities, and other critical assets. EOD forces equip, train, and organize to support tactical land forces across the range of military operations.

2. **Rotary and fixed wing joint aviation assets** will provide critical augmentation to the BCT to support mobility operations. Aviation support will augment the BCT reconnaissance and fire support capability, provide airborne mine dispensing capability, support the BCTs ability to maneuver and bypass obstacles.

3. **CBRN**. CBRN assets that can support the BCT and its engineers include:

a. **CBRN Reconnaissance Platoon**. A CBRN reconnaissance platoon conducts reconnaissance, surveillance, and sampling operations.

b. **CBRN Decontamination Platoon**. The CBRN decontamination platoon conducts thorough equipment and personnel decontamination.

c. **CBRN Smoke Platoon**. The CBRN smoke platoon conducts large area smoke generation that can be used in support of a combined arms breaching operation.

4. **Civil affairs (CA) teams** execute a variety of activities such as civil-military relations, military civic action, population and resource control, and care of refugees. CA team interaction with the local authorities or populace can be employed to gather terrain and obstacle intelligence and to control access to routes or areas in support of mobility operations. CA elements assess the needs of civil authorities; act as an interface between civil authorities and the military supporting agency and as liaison to the civil populace. CA units develop population and resource control measures and coordinate with international support agencies. CA personnel are regionally oriented and possess cultural and linguistic knowledge of countries in each region.

5. **Tactical-level psychological operations (PSYOP) supports battles and engagements** by bringing psychological pressure on hostile forces and by persuading civilians to assist the tactical supported commander in achieving the commander's objectives. Another primary focus of PSYOP is to reduce interference with military operations. PSYOP personnel assist the commander by encouraging civilians to avoid military operations, installations, and convoys. PSYOP teams support counterterrorism by decreasing popular support for terrorists, terrorist activities, and terrorist causes.

b. **Marine Corps.** The RCT is the principal ground maneuver unit within the MAGTF. The RCT is task organized with combat engineers and other mobility support capabilities from the MAGTF.

For additional information about Marine Corps engineer units and capabilities, see JP 3-34, Joint Engineer Operations.

Intentionally Blank

APPENDIX C

LAND COUNTERMOBILITY CAPABILITIES

1. Employment of Barriers, Obstacles, and Mines

As with the support of mobility, countermobility operations will be affected by the operational environment. Countermobility execution is primarily the responsibility of combat engineers although many other capabilities are integrated with their efforts. The engineer and the tactical commander must decide early in the planning process how to best position obstacles (including mines and other obstructions) to increase the effectiveness of friendly fire and maneuver and deny or channel the maneuver of the enemy. Combined arms obstacle integration is a necessary function of countermobility operations. Countermobility operations are also a part of support to movement and maneuver and have the likelihood of requiring and competing for many of the same combat engineer assets that are also required for mobility or survivability operations. Properly integrated obstacles, obscurants, and fires help to wrest the initiative from the enemy and deny him his objectives.

a. **Barriers.** A barrier is a coordinated series of obstacles designed or employed to channel, direct, restrict, delay, or stop the movement of an opposing force and to impose additional losses in personnel, time, and equipment on the opposing force. Barriers can exist naturally, be man-made, or a combination of both. The construction of barriers may require extensive engineer support, time, and materials and is more likely to employ general engineers in their construction than obstacles or minefields.

b. **Obstacles.** An obstacle is any obstruction designed or employed to disrupt, fix, turn, or block the movement of an opposing force. They are also employed to impose additional losses in personnel, time, and equipment on the opposing force. Obstacles can exist naturally, be man-made, or are a combination of the two. The effectiveness of obstacles is enhanced considerably when covered by observation and fire. Obstacles include abatis, AT ditches, blown bridges, built-up areas, minefields, rivers, road craters, terrain, and wire. As mentioned above, mines are employed in combination with other obstacles to create complex obstacles.

c. **Land Mines.** Mines are explosive devices that are emplaced to kill, destroy, or incapacitate enemy personnel and/or equipment. They can be employed in quantity within a specified area to form a minefield, or they can be used individually to reinforce nonexplosive obstacles. They can also be emplaced individually or in groups to demoralize an enemy force. Mines may be emplaced by hand, or delivered by other means. A minefield is an area of ground that contains mines or an area of ground that is perceived to contain mines (a phony minefield). Minefields may contain any type, mix, or number of AT or AP mines. By treaty and executive order, US forces may no longer use non-self-destructing APLs, except to train personnel engaged in demining and countermine operations. The use of the M18A1 claymore used in the command-detonation mode is not restricted under international law or executive order. Claymores may be also used in the tripwire mode if they are not left out longer than 72 hours; are located in the immediate proximity of the military unit that emplaced them; and the area is monitored by military personnel to ensure civilians stay out of the area. As the United States seeks to end its reliance on non-self-

destructing APLs, commanders must consider the increased use of other systems. Tactical minefield effects include disrupt, turn, fix, and block. Minefields are used to:

- (1) Produce a vulnerability to enemy maneuver that can be exploited by friendly forces.
- (2) Cause the enemy to piecemeal his forces.
- (3) Interfere with enemy C2.
- (4) Inflict damage to enemy personnel and equipment.
- (5) Exploit the capabilities of other weapon systems by delaying enemy forces in an engagement area.
- (6) Protect friendly forces from enemy maneuver and infiltration.

d. **Types of Minefields.** There are four general types of minefields - protective, tactical, nuisance, and phony. Each type is determined by its distinct operational environment purpose. Therefore, minefields are employed differently, and they target the enemy in unique ways that support the overall concept of the operations.

(1) **Protective minefields** are employed to protect soldiers, equipment, supplies, and facilities from enemy attacks or other threats. Protective minefields are usually employed and emplaced at the small-unit level (platoon or company/team). The authority to emplace protective minefields is normally delegated to the company/team commander. In some cases, such as a hasty defense, protective minefields are laid on short notice by units that use mines from their basic load or local stock. More commonly, protective minefields are used as part of a unit's deliberate defense. The mines are laid so that they are easy to detect and recover by the laying unit. Much like final protective fires, protective minefields provide the defender with close-in protection during the enemy's final assault. Protective minefields serve two purposes. First, they impose a delay on an attacker that allows the defender time to break contact as the unit displaces to another battle position. Secondly, they break up the enemy's assault to complete its destruction. The composition of a protective minefield is driven by the vulnerability of the defender.

(2) **Tactical minefields** directly affect the enemy's maneuver in a way that gives the defending force a positional advantage. Tactical minefields may be employed by themselves or in conjunction with other types of tactical obstacles. They attack the enemy's maneuver by disrupting its combat formations, interfering with its C2, reducing its ability to mass fires, causing him to prematurely commit limited breaching resources, and reducing his ability to reinforce. The defender masses fires and maneuver to exploit the positional advantage created in part by tactical obstacles. Tactical minefields add an offensive dimension to the defense. They are a commander's tool for recapturing and maintaining the initiative that is normally afforded to an attacker. Combined with fires, tactical obstacles force the attacker to conform to the defender's

plan. Tactical minefields may be emplaced during offensive operations to protect exposed flanks, isolate the objective area, deny enemy counterattack routes, and disrupt enemy retrograde.

(3) **Nuisance minefields** impose caution on enemy forces and disrupt, delay, and sometimes weaken or destroy follow-on echelons. Nuisance minefields are a form of tactical minefields. Once nuisance minefields are emplaced, they do not require cover by observation or direct fire. Nuisance minefields are usually irregular in size and shape; they can be a single group of mines or a series of mined areas. They can be used to reinforce existing obstacles and can also be rapidly emplaced on main avenues of approach. Conventional mines and SCATMINES may be used in nuisance minefields.

(4) **Phony minefields** deceive the enemy about the exact location of real minefields. They cause the attacker to question his decision to breach and may cause him to expend his reduction assets wastefully. Phony minefields may be employed in conjunction with other minefields, but should be used only after the enemy has become mine-sensitive. The success of phony minefields depends on the enemy's state of mind. The bluff succeeds best when the enemy is mine-conscious and has already suffered the consequences of a mine encounter. A fear of mines can quickly evolve into paranoia and break the momentum of the enemy's attack. Therefore, phony minefields are normally employed in conjunction with real minefields and are seldom employed alone. Once the enemy has become mine-conscious, phony minefields may produce considerable tactical effects with very little investment in time, labor, and material. Phony minefields may also be used to extend the front and depth of live minefields when mines or labor are in short supply or when time is restricted. They may be used to conceal minefield gaps through live minefields. **There is no guarantee that phony minefields will achieve their purpose.**

e. It is important to distinguish the difference between the types of minefield and the means of emplacement. Volcano, Modular Pack Mine System, standard-pattern, and row mining are not types of minefields; they are just some of the means used to emplace tactical, nuisance, and protective minefields. They may also be the method of emplacement that is replicated by a phony minefield.

f. Types of Mines

(1) **Antitank Mines.** AT mines are designed to immobilize or destroy vehicles and their occupants.

(a) **Types of Kills.** An AT mine produces a mobility kill (M-Kill) or a catastrophic kill (K-Kill). An M-Kill destroys one or more of the vehicle's vital drive components (for example, breaks a track on a tank) and immobilizes the target. An M-Kill does not always destroy the weapon system and the crew; they may continue to function. In a K-Kill, the weapon system or the crew is destroyed.

(b) **Types of Sensing.** AT fuses fall into three design categories:

1. **Track-width.** Usually pressure-actuated, requiring contact with the wheels or tracks of a vehicle.

2. **Full-width.** Activated by several methods - acoustics, magnetic influence, tilt-rod, radio-frequency, infrared-sensor, command, or vibration. Tilt-rod or magnetic-influence fuses are the most common. Full-width fuses are designed to be effective over the entire target width and can cause a K-Kill from penetration and spalling metal or from secondary explosions. When a full-width fuse is activated solely by contact with the wheels or tracks of the target vehicle, it usually causes an M-Kill because most of the energy is absorbed by the wheels or tracks.

3. **Off-route.** Designed to be placed along the side of a route likely to be taken by armored vehicles. It has numerous fuzing possibilities, including infrared, seismic, break wire, and magnetic. It produces an M-Kill or a K-Kill, depending on the location of the target at the time of mine detonation.

(c) **Types of Warheads.** AT mines can be identified by their warheads:

1. Blast AT mines derive their effectiveness from the force generated by high-explosive detonation. They usually produce an M-Kill when the blast damages the track or the vehicle, but a K-Kill is also possible.

2. Shaped-charge mines use a directed-energy warhead. A shaped charge is formed by detonating an explosive charge behind a cone of dense metal or other material. Upon detonation, the cone collapses and forms a metal slug and a gaseous metal jet that penetrate the target. A K-Kill is probable if the crew or ammunition compartment is hit.

3. Explosive-formed penetrating mines have an explosive charge with a metal plate in front. Upon detonation, the plate forms into an inverted disk, a slug, or a long rod. A K-Kill is probable if the crew or ammunition compartment is hit.

(2) Antipersonnel Mines

(a) **Types of Kills.** AP mines can kill or incapacitate their victims. The injuries and deaths they cause commit medical resources, degrade unit morale, and damage nonarmored vehicles. Some types of AP mines may break or damage the track on armored vehicles.

(b) **Types of Sensing.** AP mines can be fused in many ways, to include pressure, seismic, wire, or command detonation:

1. Pressure fuses usually activate an AP mine when a load is placed on the fuse.

2. Seismic fuses activate an AP mine when the sensor detects vibrations.

3. Trip wires or break wires activate an AP mine when something disturbs barely visible wires.

4. Command-detonated mines are activated by a soldier when he detects the enemy in the mines' blast area.

(c) **Types of Effects.** AP mines contain five types of effects:

1. **Blast.** Cripples the foot or leg of a soldier who steps on it; can also burst the tires of a wheeled vehicle that passes over it.

2. **Bounding-fragmentation.** Throws a canister into the air; the canister bursts and scatters shrapnel throughout the immediate area.

3. **Direct-fragmentation.** Propels fragments in the general direction of enemy soldiers.

4. **Stake-fragmentation.** Bursts and scatters shrapnel in all general directions.

5. **Chemical.** Disperses a chemical agent to whoever activates it; contaminates the surrounding area.

(3) **Antihandling Devices (AHDs).** AHDs perform the function of a mine fuse if someone attempts to tamper with the mine. They are intended to prevent moving or removing the mine, not to prevent reduction of the minefield by enemy dismounts. An AHD usually consists of an explosive charge that is connected to, placed next to, or manufactured in the mine. The device can be attached to the mine body and activated by a wire that is attached to a firing mechanism. US forces can employ AHDs on conventional AT mines only. Other countries employ AHDs on AT and AP mines. Some mines have extra fuse wells that make it easier to install AHDs. An AHD does not have to be attached to the mine; it can be placed underneath the mine. Mines with AHDs are sometimes incorrectly called booby-trapped mines.

2. Staff Integration of Countermobility and Support to Movement and Maneuver

Each maneuver force echelon down to the BCT and the RCT level has organic staff capability (engineers, MP, CBRN, and others such as EOD when augmented) to integrate their collective CS countermobility capabilities into the combined arms fight. These CS planners are the primary members of the battle staff responsible for understanding and integrating countermobility capabilities to support movement and maneuver. Those capabilities may be organic to or augment the maneuver force. These staff members synchronize their collective capabilities to support the needs of the maneuver commander and assure movement and maneuver for the force. Countermobility focuses on denying the enemy movement and maneuver as well as enabling freedom of movement and maneuver of the friendly force.

3. Countermobility Units and Capabilities

a. Army

(1) **Organic Countermobility Units and Capabilities.** The Army is restructuring from a division-based to a brigade-based force — the modular force. Modular force brigades are strategically flexible. The major combat and support capabilities a brigade needs for most operations are organic to its structure. Each BCT has one or more organic combat engineer companies, whose primary focus include supporting combined arms countermobility operations. Other engineer elements in the BCT include a terrain team and engineer planners. See JP 3-34, *Joint Engineer Operations*, for more information about these units and their capabilities. Other countermobility support assets within the BCT include reconnaissance elements and, in some cases, MP platoons. Additional information on the structure of each of the BCTs and their subordinate units can be found in FM 3-90.6, *Heavy Brigade Combat Team*, and FM 3-90.61, *Brigade Special Troops Battalion*. Additional information on the capabilities and structure of the organic combat engineers and those engineer organizations and capabilities likely to augment each of the BCTs can be found in FM 3-34, *Engineer Operations*, and FM 3-34.22, *Engineer Operations - Brigade Combat Team and Below*.

(2) **Augmenting Countermobility Units and Capabilities.** The organic structure of the BCT does not include all of the combat engineer and other elements needed to conduct countermobility operations. The BCTs have organic engineer elements as shown previously in this appendix, but may need additional capabilities based on mission requirements. The BCT commander and staff must identify and address required capability shortfalls through augmentation.

(a) **Engineer Augmentation.** Organic engineer capability within the BCTs will require augmentation to support countermobility operations exceeding their close CS capability. The engineer companies of the HBCT are equipped with two Volcano mine dispensers. The single engineer company of the SBCT is equipped with three Volcano mine dispensers, while the IBCT has no organic Volcano mine dispensing equipment. The engineer force pool includes engineer units not organic to a BCT or embedded in a headquarters staff. For a deliberate defense; the BCT will generally require augmentation of an engineer battalion headquarters with countermobility augmentation that includes mobility assault, sapper, and engineer support companies to perform countermobility tasks in support of the BCT. The type and number of augmentation units required will vary with METT-T. Engineer units and capabilities likely to augment the BCT in countermobility operations include the **sapper company**, **mobility augmentation company**, and **engineer support company**.

For more information about these units, see JP 3-34, Joint Engineer Operations.

(b) Other Countermobility Support Augmentation

1. Rotary- and fixed-wing joint aviation assets will provide critical augmentation to the BCT to support countermobility operations. Aviation support will augment

the BCT reconnaissance capability, add fire support capability including the possible employment of SCATMINES, and support the BCTs ability to maneuver in relation to the natural or emplaced obstacles.

2. Indirect fires are integrated with the countermobility effort to magnify the effects of the barriers, obstacles, and mines. The organic artillery battalion in each of the BCTs will be augmented or reinforced to provide the requisite fire support for the BCT.

3. CBRN assets that can support the BCT and its engineers include:

a. CBRN Reconnaissance Platoon. A CBRN reconnaissance platoon conducts reconnaissance, surveillance, and sampling operations.

b. CBRN Decontamination Platoon. The CBRN decontamination platoon conducts thorough equipment and personnel decontamination.

c. CBRN Obscuration Platoon. The CBRN obscuration platoon conducts large area smoke generation that can be used in support of a combined arms breaching operation.

b. **US Marine Corps.** The RCT is the principal ground maneuver unit within the MAGTF. The RCT is task organized with combat engineers and other countermobility support capabilities from the MAGTF.

For additional information about Marine Corps engineer units and capabilities, see JP 3-34, Joint Engineer Operations.

Intentionally Blank

APPENDIX D MARITIME MINING CAPABILITIES

1. The Minefield

a. The Minefield Compared to Other Weapons

(1) In naval warfare, a minefield is defined as an area of water containing mines laid with or without a defined pattern. If the field is not declared or the minelaying operation goes unobserved, it may not achieve its desired effect until some time after the mining agents have departed. Although able to discriminate between target types, mines are unable to determine the nationality of a target. Unless sterilizers or self-destruct features are incorporated, the mine continues to be effective until swept or otherwise neutralized.

(2) When used, mines have inflicted disproportionate casualties compared to the minelaying effort. The collateral effects of mining operations, such as the diversion of shipping, the exposure of ships to other weapon systems, and the cost of MCM efforts, can have a major impact on war aims.

(3) The design of a naval minefield, and the type and number of mines to be used depends on the field's purpose, expected adversary traffic, geographical location, amount of countermeasures to which it will be subjected, and the mining platforms to be used. Clever minefield design enables mining forces to achieve their objectives without an excessive mining effort. Although neutralizing a single mine can prove easy, an entire minefield is considered to be the real challenge.

b. Mine Classification. Naval mines are typically classified in one of three ways:

(1) Final position in the water discussed in the following paragraphs.

(2) Method of actuation which include contact, magnetic, acoustic, seismic, and pressure.

(3) Method of delivery which include air, surface, and submarine.

c. **Final Position in the Water.** When classified according to the position they assume in the water after placement, mines fall into three primary categories:

(1) Bottom or ground mines.

(2) Moored mines.

(3) Moving mines.

d. Bottom Mines

(1) Bottom mines (sometimes referred to as ground mines) are non-buoyant weapons. When planted, the mine case is in contact with the seabed and is held in place by its own weight. In areas with a soft bottom they may be completely or partially embedded. Such mines are referred to as buried mines. A mine that is resting on the bottom (unburied or partially buried) may also be referred to as a proud mine.

(2) There are two special categories of bottom mines that react differently from other bottom mines when they are initially laid, but they become similar once they have reached their final plant position:

(a) A moving bottom mine is a collective description for those designed to move along the bottom after being planted, but before becoming armed.

(b) A self-propelled mine is fitted with propulsion equipment, such as a torpedo, that is used to propel it to an intended final position. For example, a submarine could fire a self-propelled mine from a standoff point that is outside of the intended minefield location, and the mine would then propel itself to the desired location.

e. Moored Mines

(1) Moored mines have a buoyant case set at a certain depth beneath the surface. The mine is held in place above the seabed by means of a cable or chain that is attached to an anchor. They are frequently fitted with a self-destruct device that will cause them to flood and sink if separated from the anchor. Mines that separate from their anchors and rise to the surface are known as floaters. These may continue to float until they are struck and detonated, or they may deteriorate from their exposure to the seawater. Moored mines are designed for deep water, for use against both submarines and surface ships. The length and weight of the mooring cable and the mine case crush-depth will limit the maximum water depth in which they may be laid.

(2) A major disadvantage of moored mines is that the mooring cable can be cut with mechanical sweep apparatus. When this occurs, the case floats to the surface and must be avoided or destroyed. Another disadvantage is that they can be affected by current and tidal variations that cause the case to dip below its intended depth and change the angle for intended operation, thereby reducing its effectiveness against a surface target.

(3) There are two special types of moored mines that contain propulsion systems that enable them to quickly reach the intended target:

(a) Homing or guided mines are self-propelled moored mines that use guidance equipment to home onto a target once the target has been detected.

(b) A rising mine is a self-propelled or buoyant moored mine that releases from its mooring and rises to detonate on contact with (or proximity to) a target. It does not incorporate

a homing device to guide it to the target, but contains logic circuitry that enables it to calculate an estimated target location.

f. **Moving Mines.** Moving mines are classified in seven categories. Characteristics are shown in Figure D-1.

(1) **Drifting Mines**

(a) This is a mine that is buoyant or neutrally buoyant, but does not have an anchor or any other device to maintain it in a fixed position. It is free to move under the influence of wind, tide, or current. It may float at the water's surface or may be kept at a set depth beneath the surface by a depth-controlling hydrostatic device. It may be attached to a small piece of flotsam or other innocent-looking object, or even to another drifting mine. Two or more may be tethered together to increase the probability of striking a ship.

(b) Although banned from international waters by the 1907 Hague Treaty, these mines have been used on occasion. A drifting mine is classified differently from a moored mine that has become a floater, as a floater was designed to be anchored, while a drifter was designed to float freely with the tides and currents.

(c) The principal advantage of drifting mines is that their use is independent of bottom depth. The major drawback is that they scatter and may imperil friendly shipping. Consequently, drifters are usually fitted with devices designed to sink them after a short life span. As such, the most useful application has been in tactical situations in which they are placed in the path of an adversary to cause a delay or diversion.

(2) **Oscillating Mines**

(a) This is a drifting mine that regulates its depth by means of a hydrostatic control mechanism.

(b) The hydrostatic control mechanism causes it to oscillate at or near a preset water depth, which permits the mining of waters that are too deep for bottom or moored mines.

(3) **Creeping Mines**

(a) This is a modified version of a drifting mine with a buoyant case and attached weight (usually a chain). The weight is heavy enough to hold the mine near the bottom, yet not heavy enough to hold it in place.

(b) They are known as creeping mines because they move along the bottom with tidal streams or currents.

MINE TYPES BY DEPTH OF WATER					
Mine Characteristics	Water Depth in Meters (Feet)				
	Surf Zone 0-3 (0-10)	Very Shallow Water 3-12 (10-40)	Shallow Water 12-24 (40-80)	Intermediate Water 24-304 (80-1,000)	Deep Water 304+ (1,000+)
Mine Type	1. Ground 2. Antitank 3. Antiperson	1. Ground 2. Moored 3. Drifting	1. Ground 2. Moored 3. Propelled 4. Drifting 5. Rising	1. Ground 2. Moored 3. Rising 4. Drifting	1. Moored 2. Rising 3. Drifting
Size	Very Small	40-200 kilogram; 90-440 pound	40-1,200 kilogram; 90-2,650 pound	220-1,200 kilogram; 485-2,650 pound	220-1,100 kilogram; 485-2,424 pound
Expected Sensor Type	1. Contact 2. Trip Wire 3. Magnetic 4. Tilt Rod 5. Pressure Plate	1. Magnetic 2. Acoustic/ Seismic 3. Pressure 4. Contact	1. Magnetic 2. Acoustic/ Seismic 3. Pressure 4. Contact	1. Magnetic 2. Active/ Passive 3. Acoustic 4. Contact 5. Underwater Electric Potential	1. Active/ Passive 2. Acoustic 3. Contact
Multiple Influence	Not Likely	Likely	Likely	Likely	Likely
Delivery	1. Surface 2. Helicopter 3. Fixed Wing Air	1. Surface 2. Helicopter 3. Fixed Wing Air	1. Surface 2. Submarine 3. Fixed Wing Air	1. Surface 2. Submarine 3. Fixed Wing Air	1. Surface 2. Submarine 3. Fixed Wing Air
Counter-Counter-measures Features	1. Shape 2. Burial 3. Case Materials 4. Large Numbers of Mines	1. Shape 2. Logic 3. Case Materials 4. Delay Arming 5. Ship Counts 6. Burial 7. Variety of Types and Settings in Same Minefield	1. Logic 2. Case Materials 3. Bottom Sitting 4. Delay Arming 5. Ship Counts 6. Burial 7. Variety of Types and Settings in Same Minefield	1. Logic 2. Bottom Sitting 3. Delay Arming 4. Ship Counts 5. Burial	1. Logic 2. Delay Arming 3. Ship Counts
Purpose or Target	1. Personnel 2. Tanks 3. Landing Craft Air Cushioned 4. Conventional Landing Craft	Same as Surf Zone (less Tanks)	1. Landing Craft Air Cushioned 2. Conventional Landing Craft 3. Sweep Gear 4. Mine Counter-measures 5. Craft	1. Sweepers 2. Landing Craft 3. Transports 4. Combatants 5. Amphibious Assault Ships	1. Aircraft Carriers 2. Combatants 3. Transports 4. Amphibious Assault Ships

Figure D-1. Mine Types by Depth of Water

2. United States and Allied Minelaying Assets

a. Mines reach their maximum effectiveness only when they are accurately positioned in time to be armed and ready for the transit of the first target ship. This requirement places the burden on operational forces to employ delivery vehicles with acceptable capabilities. As previously stated, mines may be delivered by aircraft, submarine, or surface craft. Selection depends on the various environmental and operational factors associated with each situation. The factors to be considered include:

- (1) Type of minefield (defensive, offensive, or protective).
- (2) Number and type of mines to be delivered.
- (3) Number of sorties required.
- (4) Defensive capabilities in area, attrition rate expected for delivery vehicles, and the need for standoff delivery systems.
- (5) Environmental characteristics, such as water depth and bottom composition.
- (6) Required accuracy in delivery.
- (7) Logistics for coordinating stockpiled mines and delivery system.

b. **Air Delivery.** Aircraft are the most suitable delivery vehicles for most offensive mining operations. In general, any aircraft capable of carrying bombs can carry a similar load of sea mines of the same weight class. There are some constraints and limitations imposed by matching suspension lugs on some mines to certain bomb racks, the shape and dimensional changes of some mines brought about by the addition of flight gear or fins, and the high drag and buffeting characteristics of mines carried on external stations. Several incompatibilities can be corrected with existing adapters and modification kits, but the performance limitations imposed on high-speed aircraft are also factors. Range, weather conditions, auxiliary equipment, and armament must be considered, as each can affect the maximum permissible load aboard the aircraft. The tactical manual of the individual aircraft is the final authority on mine carriage.

(1) **Advantages of Air Delivery.** There are a number of advantages associated with aerial delivery:

- (a) Aircraft can penetrate areas denied to submarines by hydrography or to surface ships because of adversary defenses and can replenish existing fields without danger from previously laid sea mines.
- (b) Aircraft have a faster reaction time than surface ships or submarines. When properly alerted, aircraft can respond quickly and cycle faster when multiple strikes or sorties

are required. They can also get to the minefield quickly, especially from a forward-deployed carrier strike group.

(c) Aircraft are generally more readily available and can typically complete their mining mission quickly, thus becoming readily available for other missions.

(d) Aircraft can carry a wide variety of naval mines.

(e) Aircraft have a virtually unlimited approach direction.

(2) **Disadvantages of Air Delivery.** There are a number of disadvantages associated with air delivery, but for offensive scenarios, many of these can be overcome through proper planning.

(a) The payload-per-sortie is relatively small except for large, bomber aircraft. However, this disadvantage can be overcome by their ability to rapidly execute multiple sorties.

(b) Minelaying accuracy of aircraft is lower than for a surface ship but is adequate for offensive mining.

(c) Many aircraft types can be restricted by weather conditions.

(d) The range of aircraft is more restricted than that of surface ships or submarines.

(3) **Helicopter Delivery.** It is possible to deliver sea mines by helicopter, but such use is inefficient due to limited range and carrying capacity.

c. **Submarine Delivery.** Submarines are most effective in areas that are too well protected for surface or aircraft delivery. Normally, they will be used in offensive fields, but may be used to lay defensive fields as well. This can take place day or night; surfaced or submerged. The availability of the Submarine-Launched Mobile Mine enhances the submarine capability.

(1) **Advantages of Submarine Delivery.** The secrecy with which a submarine can deliver naval mines over great distances to adversary ports or operating areas provides tactical advantage.

(2) **Disadvantages of Submarine Delivery**

(a) Nuclear attack submarines (SSNs) cannot carry large payloads (must unload one torpedo for every two sea mines).

(b) SSNs have a slow reaction time. If not preloaded with mines for a contingency, they must return to a port where torpedoes can be off-loaded and naval mines loaded.

(c) Transit speed is slow when compared to aircraft delivery.

(d) There are limited submarines available and they have other competing missions.

(e) The variety of mine types available is limited and they must be configured to fit a torpedo tube.

d. **Surface Delivery.** This is the preferred method for protective and defensive minefields where transit distances are limited and the area to be mined is benign. Any surface ship can be configured to lay sea mines by hoisting or rolling them over the side or by using temporarily installed mine rails or tracks. Although minelaying ships of various types appeared on the Navy roster for about 60 years, there are no active surface ships in service today. However, should an operational requirement develop, this capability could be provided by crafting appendages and then engineering them to fit available ships. Suitable conversion of cargo ships is also an option. Some allies do have a surface minelaying capability.

(1) **Advantages of Surface Delivery**

(a) Able to carry a larger payload than aircraft or submarine minelayers.

(b) Surface assets have the ability to position mines more accurately than the other delivery assets.

(2) **Disadvantages of Surface Delivery**

(a) Surface ships have a slow reaction time and are not suitable when time is critical.

(b) Surface minelaying is not covert.

(c) They are vulnerable to attack, so they are not effective offensively.

(d) Surface ships are unable to replenish existing minefields.

3. **Additional Information**

Additional information on naval maritime MIW capabilities can be found in the NWP 3-15, *Naval Mine Warfare*, series of publications, or by contacting Commander, Mine Warfare Command.

Intentionally Blank

APPENDIX E

MARITIME MINE COUNTERMEASURE CAPABILITIES

1. Mine Countermeasures Staff

One of the first actions that should be taken when considering deployment of MCM forces (in addition to a site survey) is the deployment of one or more staff liaison officers from MCM-1 squadron staffs. The primary purpose of these officers is to maintain the communications flow between a task group and task force commander or geographic combatant commander and the MCMC. They are instrumental in making the initial decisions on required forces and preparation for deployment of follow-on forces. The MCMC and staff can be deployed by airlift independent of other forces or by sea embarked in a ship of opportunity with appropriate C2 capabilities. The staff may consist of between 15 to 20 people with administrative support equipment and supplies. They can be deployed on very short notice, but not until some support facilities are available in theater. For effective planning and control, the MCMC requires a dedicated command center with C2 capabilities. MCM-1 are not equipped to support a staff because of limited berthing, insufficient communications, and no surplus space in the combat information center for staff use. It is also possible for the MCMC to set up in an ashore command center. Minimum basic requirements are as follows:

- a. Secure space for six to eight people (two to three maintaining a 24-hour watch).
- b. Status boards and space for plotting on hydrographic charts (chart table or large flat table).
- c. Communication suite to support sending and receiving message traffic, as well as maintaining secure voice and data communications with other command authorities and the MCM forces.
- d. Power source for desktop computers.
- e. Messing and berthing.

2. Mine Countermeasures Command and Support at Sea

C2 and support of MCM forces at sea are critical in successful completion of MCM operations. This was demonstrated in the Persian Gulf and during mine clearance operations in North Vietnamese waters. For both operations, amphibious ships of opportunity (SoOs) were configured to temporarily fill the MCM C2 role. The effort required to properly configure as SoO is extensive. It must support the entire MCM triad, each element of which has unique equipment and limited organic repair, maintenance, and supply capabilities. The SoO must provide:

- a. Maintenance and repair services that include support for nonmagnetic engines and combat system equipment.

b. Storage space for spare and repair parts including replacement MCM gear, ammunition and military explosives, gasoline, diving gear, and recompression chambers.

c. Medical, dental, disbursing, and other personnel administrative support services.

d. In addition to serving as the support ship for the MCM elements, it must also support the MCMC and staff. This places a considerable demand on the administrative and communications capabilities of any ship.

3. Airborne Mine Countermeasures Support Ship

If operational exigencies arise that require afloat basing of AMCM, UMCM, and MCM command elements, several ship-classes might be used to provide support. Each has its merits, and each, its deficiencies. Consideration must be given to duration, MCM elements involved, MCM equipment required, and the availability of logistic and repair support. Note that embarkation of AMCM aboard amphibious shipping will engender displacement of USMC assets, which translates into diminished landing force combat power.

a. **Amphibious assault ship (general purpose) (LHA) and amphibious assault ship (dock) (LHD).** Both the LHA and LHD are considered apt platforms for AMCM operations should the urgent need arise, as they have the required facilities necessary to support independent MCM operations. The aircraft and MCM equipment, as well as all support equipment and personnel, can be loaded aboard and the ship prepared for MCM operations upon arrival in the operational area. If still required in an amphibious role, careful coordination is required to prevent shipboard support facilities and deck space from becoming critically overloaded.

b. **Amphibious transport dock (LPD).** With an abridged support capability, the LPD has been used for small, short-duration AMCM deployments. Aircraft size and deck weight limitations severely restrict sustained, high-tempo operations as do deck and storage space constraints.

4. Organic Mine Countermeasures Systems and Capabilities Assigned to the Strike Group

A number of organic MCM systems are currently available to strike groups to provide a limited MCM capability to ensure initial freedom of movement to the carrier strike group and expeditionary strike group. These systems, consisting of a mix of MCM ships and underwater systems, include:

a. **Remote Environmental Monitoring Unit System (REMUS).** REMUS is a lightweight unmanned underwater vehicle used for route survey and minehunting missions. Its standard configuration carries an up and down looking acoustic Doppler current profiler, sidescan sonar, a conductivity/temperature/depth profiler, and a light scattering sensor.

b. **Submarine High Frequency Sonar Program.** Fielded on attack submarines the high frequency sonar provides a high resolution, high discrimination, still picture of the bottom as

well as the water column at speeds to 15 knots. The system can detect and map a variety of mines and mine like contacts.

5. Systems and Procedures

a. **Strike Group Capabilities.** Most SGs have a capability for self-protection. Ships with embarked helicopters can provide visual and radar searches for drifting mines or signs of other mines along the intended track. Surface combatants with sonar modifications for mine avoidance and radar can provide some degree of reconnaissance along the track ahead of other ships not so equipped.

b. **Combined Mine Countermeasures Operations.** Combined MCM operations are those conducted with US and allied MCM forces. These multinational operations may involve forces accustomed to operating under different doctrine, different tactical procedures, and limited connectivity in C2 systems. To determine the best tactical application of all available assets, planning for combined operations can follow the same procedure as for integrated operations. However, combined operations are sometimes affected by national political limitations that prevent free employment of some forces. An example might be the prohibition of force employment in the territorial waters of a foe using an integrated force that would include a neighboring nation's assets. The same tactical approach of considering all resource capabilities and limitations should be applied, although these limitations may serve to complicate planning.

Intentionally Blank

APPENDIX F HUMANITARIAN MINE ACTION

"I think we do agree on one central goal, and that is the need to end the threat that landmines pose to civilians. The best way to do that is to proceed full speed ahead with the job of pulling mines from the soil like the noxious weeds that they are. I am proud that the United States is far and away the world leader in mine removal programs."

Madeleine K. Albright
Secretary of State, 8 April 1999

1. Evolution of United States Humanitarian Mine Action

a. Modern US humanitarian mine action (HMA) began in 1986, when US Army special forces teams in southern Honduras trained Honduran Army engineers to clear land mines from agricultural land north of the Nicaraguan border.

b. In 1988, a United States Agency for International Development team traveled to Afghanistan to assess the land mine situation following the Soviet occupation. The National Security Council officially established the US Humanitarian Demining Program in 1993.

c. The current Department of Defense (DOD) Humanitarian Mine Action Program began in 1995, under the Assistant Secretary of Defense (Special Operations and Low-Intensity Conflict) (ASD[SO/LIC]), the DOD office most closely associated with US SOF.

d. US Army special forces, PSYOP teams, CA officers and other SOF and DOD elements began working toward the goal of assisting mine-affected nations in developing self-sustaining indigenous military action (MA) programs.

e. In June 1998, the Department of State (DOS) established the Office of Humanitarian Demining Programs in its Bureau of Political-Military Affairs to coordinate overall United States Government (USG) HMA work. The Interagency Working Group (IWG) was established to facilitate HMA cooperation within the USG.

2. Humanitarian Mine Action Program

a. **Mission.** The USG HMA program assists countries in relieving the suffering of the adverse effects of uncleared land mines while promoting US interests. To achieve these goals, the USG balances various political, military, economic, and technological capabilities with available resources.

b. The DOD Program is directly supervised by the geographic combatant commanders and is a critical component of the overall USG program. DOD's program concentrates on training HNs in the procedures of land mine clearance, mine awareness, and victims' assistance, as well as the development of leadership and organizational skills necessary to sustain the programs after US military trainers have

redeployed. This approach provides unique training and readiness-enhancing benefits to US SOFs while advancing geographic combatant commanders' theater security cooperation strategies. The program is authorized by Title 10 US Code (USC) Section 401. In 2004, DOD support for HMA expanded to include conventional forces.

c. The program also aids in the development of indigenous leadership and organizational skills to sustain the programs after US military trainers have redeployed. Title 10 USC Section 401(a)(4) prohibits members of the Armed Forces of the United States from engaging in the physical detection, lifting, or destroying of land mines (unless the member does so for the concurrent purpose of supporting a US military operation). Additionally, members of the Armed Forces of the United States shall not provide such humanitarian and civic assistance as part of a military operation that does not involve the armed forces. This humanitarian and civic assistance, per Title 10 USC Section 401(e)(5), includes "detection and clearance of landmines and other explosive remnants of war, including activities relating to the furnishing of education, training, and technical assistance with respect to the detection and clearance of landmines and other explosive remnants of war."

d. Significant benefits accrue to the DOD - the program provides access to geographical areas otherwise not easily available to US forces. It also contributes to unit and individual readiness by providing unique in-country training opportunities that cannot be duplicated in the United States. For example, US military forces hone critical wartime, civil-military, language, cultural, and foreign internal defense skills.

3. Oversight and Policy Direction

a. The US DOS sets policy and provides overall direction for US HMA. Within DOS, the Office of Humanitarian Demining Programs serves as the lead organization in coordinating US HMA activities worldwide. The office develops and implements country-specific HDM programs and oversees the interagency strategic planning and policy development processes supporting US global MA activities. DOS Office of Humanitarian Demining Programs directly supports the work of the IWG on humanitarian demining. Within DOS, humanitarian demining oversight is located within the Office of Weapons Removal and Abatement, Bureau of Political-Military Affairs.

b. **US policy and Department of Defense role in HMA.** The State Department makes several important points regarding DOD HMA work:

(1) The USG provides HMA assistance to many countries throughout the world to relieve human suffering from the dangers of land mines, to promote regional peace and stability and to promote US foreign policy and national security goals. A collateral benefit to the program is the enhancement of operational readiness skills of participating US forces.

(2) Within the overall USG HMA program, DOD provides training to foreign nations in mine clearance operations, mine awareness education and information campaigns, assistance

in the establishment of HMA centers, emergency medical care, and leadership and management skills needed to successfully conduct a national-level HMA program.

(3) When called upon for mine-action training, the ultimate goal of DOD participation is to develop a self-sustaining, indigenous demining capability within each recipient country. SOF normally conduct HMA training, using the “train-the-trainer” concept, with augmentation from EOD and engineer personnel, as needed.

(4) The geographic combatant commands execute the HMA program, providing them an excellent military-to-military engagement opportunity. DOD participation in HMA programs allow the combatant commanders to work closely with country teams to show mine-affected countries how military forces can support the civilian population.

(5) By participating in these activities, the combatant commands and the country teams demonstrate the US commitment to provide direct, bilateral humanitarian assistance, relieve suffering, improve the socio-economic environment, promote regional stability and support democratic ideals.

(6) **Department of Defense Roles.** Generally, DOD funds a HMA program’s start-up costs, and DOS provides subsequent funds to procure the necessary equipment for mine-affected countries to conduct mine clearance operations. Additional funds support DOD-sponsored demining technology research and development. DOD roles can be summarized as follows:

(a) In coordination with Defense Security Cooperation Agency (DSCA) allocates DOD funds for the DOD element of the USG HDM program.

(b) Assists host countries in the establishment of HDM organizations.

(c) Coordinates US HDM training with Fort Leonard Wood Humanitarian Demining Training Center.

(7) The components of the DOD humanitarian HMA program are:

(a) Mine awareness education.

(b) Mine action center development.

(c) Civil-military cooperation.

(d) Victim assistance.

(e) HMA training - or train-the-trainer - the core of the program. More than 4,000 indigenous trainers have benefited from this core program.

4. The Interagency Working Group on Humanitarian Demining

An IWG on Land Mines and Demining has been established at the request of the National Security Council. The announcement of the Demining 2010 Initiative in October 1997 created a separate responsibility, generating increased international coordination and contributions for HDM, complementary to the mandate of this IWG.

a. **Interagency Working Group Members.** IWG members include:

- (1) National Security Council.
- (2) DOS (Chair).
- (3) DOD (Vice-Chair).
- (4) United States Agency for International Development.
- (5) Designated members of the Intelligence Community.

b. **Office of the Assistant Secretary of Defense for International Security Affairs, Defense Security Cooperation Agency, Office of Humanitarian Assistance, Disaster Relief and Mine Action.**

(1) Acts as DOD's lead HDM agency by exercising overall responsibility, corporate level policy, planning and oversight for DOD HDM programs conducted pursuant to Title 10, USC, Section 401. The HMA program assists countries that are experiencing the adverse affects of uncleared land mines and other explosive remnants of war. The program is directly managed by the combatant commanders and contributes to unit and individual readiness by providing unique in-country training opportunities that cannot be duplicated in the United States.

(2) Provides the Vice Chair of the IWG and cochairs the sub IWG.

(3) Develops and implements DOD HDM activities based on applicable presidential policy guidance coordinated through the IWG.

(4) Coordinates and authorizes funding for DOD HDM operations and related activities.

(5) Oversees the combatant commanders' operational mine action, humanitarian and civic assistance programs.

c. **Defense Security Cooperation Agency**

(1) Coordinates and monitors execution of DOD HDM training operations and related program activities. In coordination with ASD(SO/LIC), plans, programs, budgets for, and allocates

budget authority from the Overseas, Humanitarian, Disaster and Civic Aid appropriation to support the DOD HDM program.

(2) Assists the Joint Chiefs of Staff, United States Special Operations Command, geographic combatant commanders, host countries, and other organizations in planning for, establishing, and executing HMA programs.

(3) Coordinates with the DOS on security assistance policy, budget planning, and execution issues for demining activities.

(4) Manages host countries' foreign military financing and specified nonproliferation, antiterrorism, demining and related projects accounts.

(5) Sells defense articles and services, through the Foreign Military Sales program, to host countries for support of HMA programs.

d. Chairman of the Joint Chiefs of Staff:

(1) The Joint Staff/J-3 Operations Directorate is the office of primary responsibility for HMA activities.

(2) Coordinates requested HMA operations and force allocation with geographic and supporting combatant commanders.

(3) Provides HMA mission taskings, guidance, specific instructions and operational control authority to the geographic combatant commanders.

(4) Ensures that plans developed by combatant commanders include, at minimum, the number of training deployments anticipated for each mine-affected country in the area of responsibility and time-phasing and milestones for each operation. Also include any subsequent training missions or assessments required and other factors (including projected resource requirements) that will be necessary to plan for and execute the proposed mission.

(5) Provides oversight Armed Forces of the US training programs outside the continental United States with partner nations.

e. Geographic Combatant Commander:

(1) Plans, manages, and conducts HDM training operations within the combatant commander's area of responsibility.

(2) Recommends and prioritizes theater HDM program recommendations through the Joint Staff to Office of the Assistant Secretary of Defense, DSCA and the IWG.

(3) Executes DOD-funded HDM programs in host countries.

(4) Coordinates US participation in specified multilateral HDM operations (e.g., those sponsored by the Organization of American States.)

(5) Conducts assessment for HDM programs and HMA technologies.

(6) Formulates policies for HMA training within DOD, in coordination with Deputy Assistant Secretary for Stability Operations Special Operations and Low-Intensity Conflict.

5. Interagency Humanitarian Demining Strategic Plan

The plan, written by the State Department, defines roles of the various US government agencies. In recent years, changing roles and responsibilities among US Government agencies participating in the US Humanitarian Demining Program and the rapid expansion of the program have necessitated updates in the Interagency Humanitarian Demining Strategic Plan. These revisions are based on experiences and lessons learned over the last few years on HDM efforts. The strategic plan is designed to accelerate and make more effective USG efforts to make mine-affected countries around the world mine-safe. A complete summary of the US Demining Policy: USG Interagency Humanitarian Demining Strategic Plan can be found at the Department of State Website at <http://www.state.gov/t/pm/rls/rpt/spec/2819.htm>.

6. Additional and up-to-date information on HDM can be found by contacting:

a. Humanitarian Demining Contact Information:

Mailing address:

US Department of Defense
Humanitarian Demining Training Center
ATTN: ATSE-HAMA-HDM
Bldg 5415, FLW Hwy 38
Ft. Leonard Wood, MO 65473
Map and driving directions on student information page of Website.

Telephone:

Commercial: 573-563-6199
DSN: 676-6199
FAX: 573-563-5051
E-Mail: atsedotHDM@wood.army.mil
Ft. Leonard Wood home page: www.wood.army.mil

b. DSCA Contact Information:

Mailing address:

DSCA - HA/MA
1111 Jefferson Davis Highway
Suite #402
Arlington, VA 22202

Telephone:

Commercial: 703-601-3657

FAX: 703-602-0075

E-Mail: LPA-WEB@dscamil

DSCA HA home page: <http://www.dscamil/programs/HA/HA.htm>

Intentionally Blank

APPENDIX G

IMPROVISED EXPLOSIVE DEVICES DEFEAT

“This is not a new war. Our enemies have been waging it for some time, and it will continue for the foreseeable future. As President Bush has stated, ‘This is a different kind of war against a different kind of enemy.’ It is a war we must win, a war for our very way of life.”

**General Peter J. Schoomaker,
Chief of Staff of the Army
Arrival Message 1 August 2003**

1. The Improvised Explosive Device Support System

a. The past two decades have been a period in which terrorists and insurgents have developed and engaged in increasingly sophisticated forms of asymmetric warfare. During that time, the IED has become the weapon of choice for engaging more technologically sophisticated military forces. IEDs are a weapon of choice in broader insurgency and terrorist campaigns because they are difficult to detect and defeat, they can be concealed and transported inconspicuously, they can leverage readily available ordnance to create enhanced-effect explosives, and they are easily available technologies that can be used to improve their range and lethality. The rise of the internet and sponsorship by governments have enabled our adversaries to design, deploy, and test under live conditions increasingly sophisticated devices that can defeat almost any level of armor protection. When combined with an IO effort, the IED has enabled our adversaries to have a destabilizing effect on the population of a country thereby undermining local authorities and placing into question the legitimacy of governments.

b. Negating and mitigating the effects of IEDs as a means of asymmetric attack requires an approach that transcends all levels of warfare. It requires the synergistic effects derived from integrated joint and multinational forces, interagency cooperation, and HN security forces and population participation.

c. Designing an operation to defeat the use of IEDs is a complex task that requires an integrated, synchronized series of actions from the tactical to the strategic levels of command. It is designed to reduce the effectiveness of IEDs as a weapon to a point that the adversary chooses a different attack method. It must also be conducted within the context of the broader counterinsurgency campaign — if you defeat the insurgency, you will defeat the IED. An IED attack is the result of a planned tactical operation with several key elements that work in a coordinated and synchronized manner to attain a desired result. As Figure G-1 illustrates, our adversaries’ IED infrastructure is a complex, multi-level organization that can quickly regenerate itself if not attacked in a well coordinated manner. An adversary will conduct IED activities at varying or multiple levels: local, national, regional, or international. Activities fall into strategic, operational, and tactical levels of warfare with a specific center of gravity for each level. International leadership is the center of gravity at the strategic level due to the assumption that global extremist organizations are exporting IED manufacture and employment techniques into the joint operations area (JOA), and that they are assisting in the adaptation to IED defeat

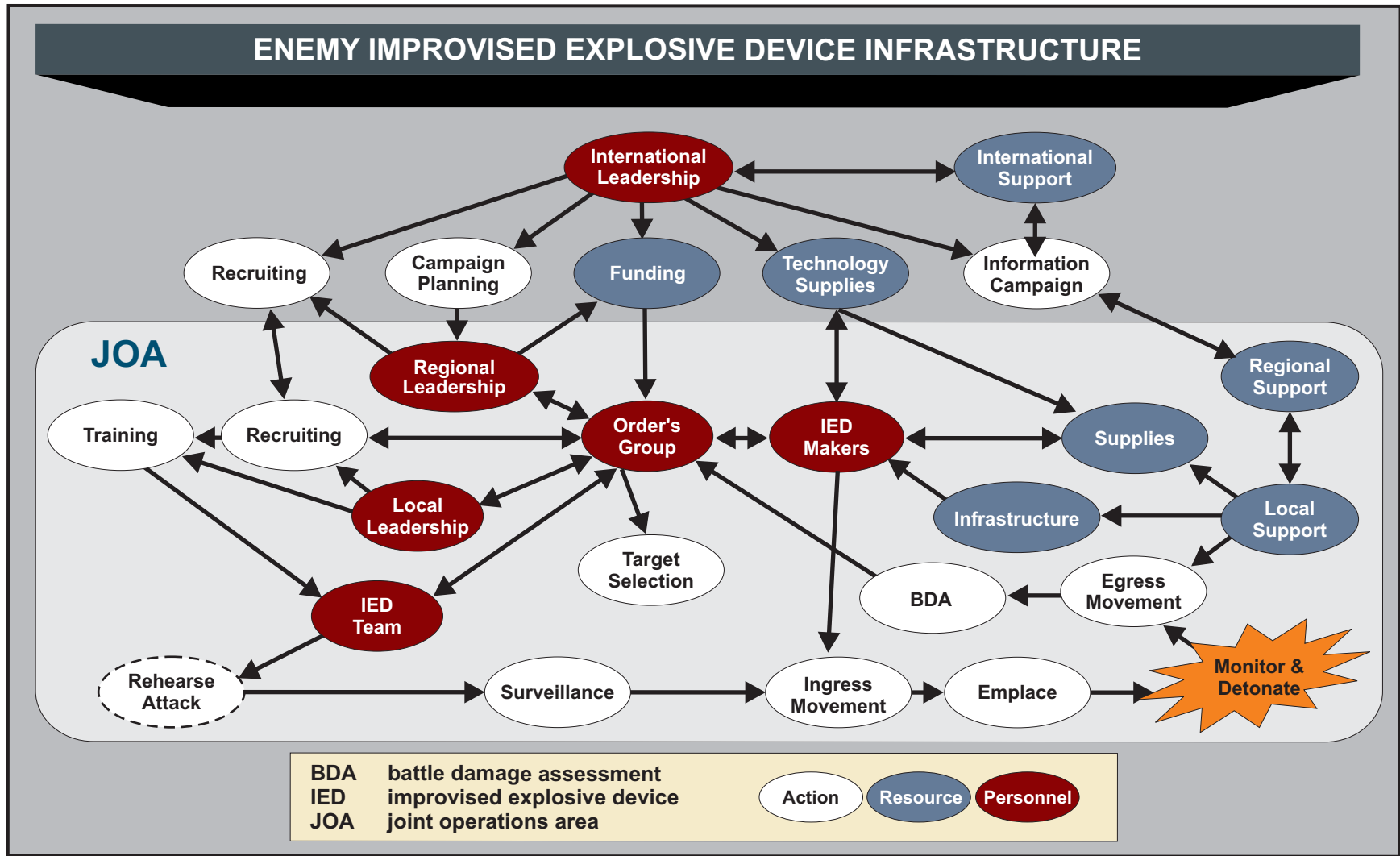


Figure G-1. Enemy Improvised Explosive Device Infrastructure

countertactics. At the operational level, in the early stages of an insurgency, the IED maker/engineer is the center of gravity. This is based on the assumption that a finite number of IED makers exist at the beginning of the conflict and the number of IED makers will quickly proliferate as the insurgency gains momentum. As the insurgency matures, the operational center of gravity will shift to denying the insurgents' popular support. At the tactical level, the center of gravity is based on the assumption that IEDs employ a variety of detonation methods and that steps can be taken to prevent the detonation or protect against its effects. At each level, the JFC must undertake actions that will enhance force protection, deny the enemy the freedom to employ the IEDs, and ultimately eliminate the infrastructure that enables the IED to be the enemy's weapon of choice.

d. Defeating the IED is not a stand alone effort. Successful IED defeat operations begin with a thorough understanding of the enemy and the common activities associated with an IED attack. Activities include leadership, planning, financing, materiel procurement, bomb making, target selection, recruiting, and attack execution. A holistic approach to understanding the requirements of an IED attack assists commanders and planners in identifying vulnerabilities. These vulnerabilities can be exploited to break the operational chain of events of the enemy. An IED defeat operation requires a multi-dimensional approach that includes interagency and intergovernmental support. It requires the application of all instruments of national power — diplomatic, information, military, and economic — to predict, prevent, detect, neutralize, and protect friendly forces.

2. Designing Improvised Explosive Device Defeat Operations

a. Designing a successful IED defeat operation is a complex task that involves all echelons of the joint force and is based on a framework designed to assure the freedom of movement of friendly forces and enable commanders and staffs to plan and take proactive measures to seek out and defeat IED events before they occur (see Figure G-2). Within each level of war there are key IED activities that influence operational planning. These activities must be viewed both individually and in the context of their relationship to the other activities that enable an IED effort to be used. IED defeat (IEDD) operations must take a holistic approach that incorporates intelligence, information, training, operations, materiel, technology, policy, and resourcing solutions designed to address all of the fundamentals of assured mobility, to include prediction, detection, prevention, neutralization, and mitigation. To a larger extent this approach should be considered in terms of joint interdiction which encompasses assured mobility as well as many other factors of warfare. IEDD operations are conducted across the phases of a military operation (i.e., shape, deter, seize the initiative, dominate, stabilize, and enable civil authority) and should be executed in multiple lines of operation, each to commence conditionally, and then to continue in parallel throughout a campaign. These lines of operation are based on the IED defeat framework of attack the network, defeat the device, and train the force.

(1) **Attack the Network.** Here the goal is to prevent the emplacement of the IED by attacking enemy vulnerabilities at multiple points in the IED system. The key vulnerabilities of the system include the will of the populace to support the insurgents and their IED tactics, the IED component's supply (logistics process) chain, the IED building process, and the IED emplacement process. This should be the main effort.

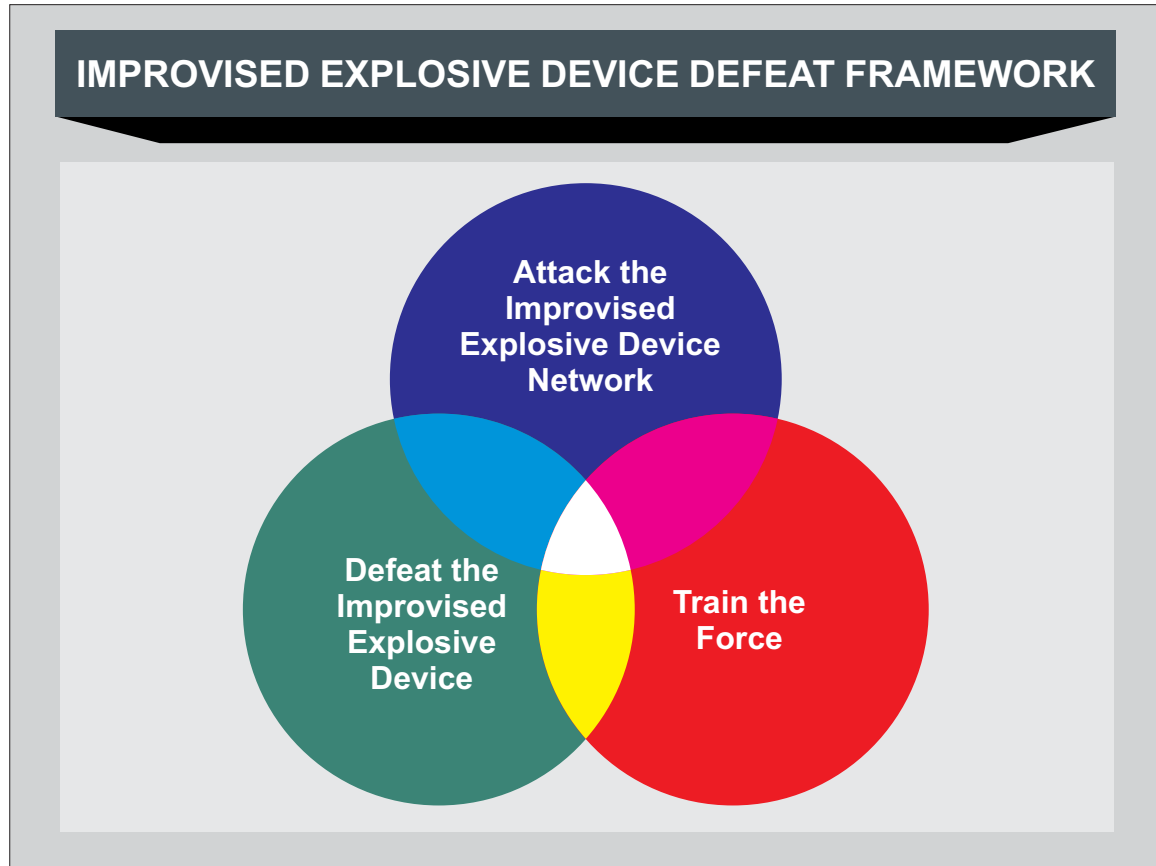


Figure G-2. Improvised Explosive Device Defeat Framework

(2) **Defeat the Device.** Here the goal is to defeat the device once it has been emplaced, including detecting emplaced IEDs and rendering them safe, protecting the force by defending against physical effects of IEDs, and mitigating propaganda effects.

(3) **Train the Force.** Here the goal includes the development of IED related TTP, drills, and SOP that are designed to enhance individual and unit protection and the unit's ability to effectively operate in a high-threat IED environment. It also includes those activities that facilitate the establishment and growth of coalition and partner nation IEDD capabilities, including the transfer of IEDD technology and TTP.

b. The IEDD framework is based on the following tenets: **predict, prevent, detect, neutralize, and protect.**

(1) **Predict.** These activities are used to identify and understand enemy personnel, equipment, infrastructure, TTP, support mechanisms or other actions in order to forecast specific enemy IED operations directed against US interests. These activities include:

- (a) Identifying patterns of enemy behavior.
- (b) Identifying emerging threats.

(c) Predicting future enemy actions.

(d) Developing priority intelligence requirements (PIRs) tied to IED operations decisive points. Linking and synchronizing detection assets to PIR related named areas of interest.

(e) Prioritizing intelligence, surveillance, and reconnaissance (ISR).

(f) Exploiting IED threat vulnerabilities.

(g) Targeting enemy IED attack nodes (such as funding and supplies).

(h) Disseminating alert information rapidly to specific users.

(i) Analyzing forensics and enabling better on-scene technical analysis.

(2) **Prevent.** These activities disrupt and defeat the IED operational chain of events. The actions focus on the target to interdict or destroy key enemy personnel (bomb makers, leaders, and financiers), the infrastructure/logistic capabilities (suppliers, bomb factories), and surveillance/targeting efforts (reconnaissance, overwatch operations) before emplacement of the device. They also include actions to deter public support for the use of IEDs by the enemy. Prevent actions aid in:

(a) Disrupting enemy operations and their support structure.

(b) Denying critical IED-related supplies to the enemy.

(c) Increasing awareness of enemy TTPs and their effectiveness.

(d) Denying the enemy the opportunity to emplace IEDs (through patrols, observation posts, checkpoints, aggressive surveillance operations, and so forth).

(e) Rewarding local nationals' cooperation in determining the locations of caches, bomb making or emplacing activities.

(f) Denying easily concealed locations (such as trash piles and debris along sides of primary routes) and removing abandoned vehicles along routes.

(3) **Detect.** These activities contribute to the identification and location of enemy personnel, explosive devices and their component parts, equipment, logistics operations, and infrastructure in order to provide accurate, timely information. The following actions assist in the efforts to interdict and destroy these activities:

(a) Detecting and identifying explosive material and other IED components.

- (b) Detecting CBRN material.
- (c) Recognizing suicide bombers.
- (d) Conducting forensic operations to track bomb makers and/or handlers.
- (e) Conducting persistent surveillance.
- (f) Training to improve human detection and location of potential hazards.
- (g) Using detection means across the full range available (from imagery, mechanical clearance operations, search techniques, dogs, and so forth).
- (h) Recognizing individual soldier actions and awareness in all activities.

(4) **Avoid.** These activities keep friendly forces from IEDs when prevention activities are not possible or have failed. Avoid activities include:

- (a) Increasing situational understanding of the area of operations and continually refining the COP and the timely and accurate dissemination of related information.
- (b) Ensuring timely and accurate status reporting and tracking.
- (c) Altering routes and routines.
- (d) Marking and bypassing suspected IEDs.

(5) **Neutralize.** These activities contribute to the destruction or reduction of enemy personnel, explosive devices, or supplies. They can be proactive or reactive in nature.

(a) Proactive activities include conducting operations to eliminate or interrupt the enemy's leaders, suppliers, trainers, enablers, and executors responsible for the employment of IEDs against coalition forces. They can also include actions, such as the use of jamming devices, to neutralize the device.

(b) Reactive activities include conducting controlled detonations or render safe procedures against identified IEDs, caches, captured enemy ammunition, and so forth. EOD forces are the only personnel authorized to render safe IEDs.

(6) **Protect.** These activities improve survivability of IED targets through hardening, awareness training, or other techniques. They include:

- (a) Disrupting, channeling, blocking, or redirecting energy and fragmentation.

- (b) Creating greater standoff distances to reduce the effect that IEDs have on their intended targets.
- (c) Incorporating unmanned platforms.
- (d) Reducing time and distance in which intended targets are within IED range.
- (e) Accelerating processes and increasing the effectiveness by which reaction and evacuation operations are conducted.
- (f) Providing blast and fragmentation protection for platforms, structures, and personnel.
- (g) Avoiding establishing patterns and predictable forms of behavior.
- (h) Conducting proper precombat inspections and rehearsals for all operations.
- (i) Treating every operation as a combat mission (from a simple convoy to daily forward operating base security).

c. The **IED defeat framework** (Figure G-2, “Improvised Explosive Device Defeat Framework”) can be broken down into two major sub elements - proactive (pre-detection) and reactive (post-detection) as shown in Figure G-3.

(1) **Proactive elements** are actions taken by friendly forces to predict, detect, prevent, avoid, neutralize, and protect against IED events.

(2) **Reactive elements** are actions taken by friendly forces to detect, avoid, neutralize, and protect against IED events.

3. Considerations in the Conduct of Improvised Explosive Device Defeat Operations

a. **Commanders** play a critical role in planning for the IED fight. There are four important considerations that are unique to understanding the design of an IED defeat operation. First, the IED threat must be addressed within the context of defeating the insurgency or terrorist campaign. Second, develop a multi-echelon, synchronized, proactive plan to attack the entire IED network. Third, there is a large technological exploitation component consisting of EOD and national technical intelligence collectors providing the critical information needed to both attack the true centers of gravity and design effective force protection measures. Fourth, the IED plan must take into consideration the many variables of the contemporary operating environment, including the ability of friendly forces to effectively communicate with the populace and obtain their support.

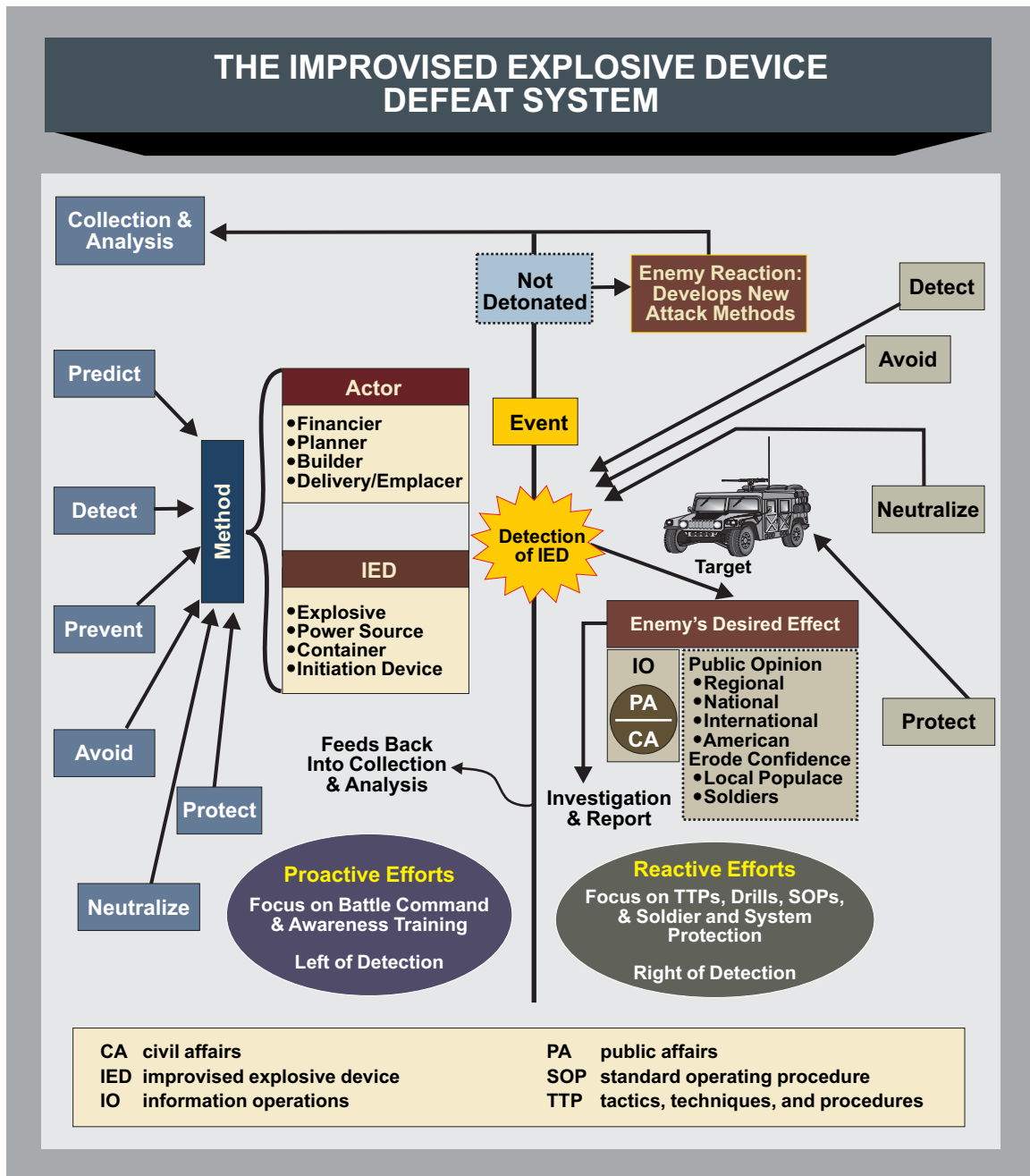


Figure G-3. The Improvised Explosive Device Defeat System

b. The goal of a well organized staff is to achieve a faster decision cycle than the threat. Planning considerations for increased operational tempo and control of the operational environment will entail an aggressive mindset (become the hunter, not the hunted) and rapid responses to the IED threat, both operationally and technologically. If the threat responds to new technologies or procedures, then friendly forces must be able to also change TTPs and technologies rapidly.

c. Commanders at all echelons must be prepared, from the initiation of planning, to deal with the IED threat and must devote adequate resources to address that threat from the tactical to

the strategic level. Operational commanders must ensure that adequate EOD resources will be available to support the anticipated operation and that specialized technical exploitation assets (such as weapons intelligence teams) and equipment (jammers, etc) are available to deploy with the force. While the amount of these specialized resources will vary depending on the mission, the commander must factor their capabilities into his overall plan. Lastly, the force must be trained on the IED threat and have appropriate TTPs in place prior to deployment.

d. IED defeat factors are considered throughout the planning process and are contained throughout the unit's OPORD. Information, directives, and tasks for IED defeat may be found in several parts of the OPORD of the unit. For example, enemy information concerning IED attacks may be found in the Intelligence and Engineer Annexes. Specific tasks such as "conduct a raid to destroy a bomb-making factory" may be found in tasks to subordinate units in the base OPORD. High-payoff targets related to IED defeat may be found in the Intelligence and the Fire Support Annexes. Specific instructions on neutralization and disposal of IEDs may be found in the EOD appendix to the engineer annex of the OPORD.

4. Organizing the Joint Task Force Headquarters for Improvised Explosive Device Defeat Operations

a. There are **two basic approaches for organizing** for the conduct of IED defeat operations. The first involves creating specialized counter IED cells within the intelligence (J-2), operations (J-3), and engineering staffs (J-7) to plan and oversee the conduct of IED defeat operations. This approach is normally used in small scale, short duration operations where supporting technical specialist forces are limited (see Figure G-4). The second approach is to create a separate headquarters (a combined joint task force [JTF]) to manage the EOD assets, associated technical specialists, and other specialized organizations that may be attached to the joint force for the IED defeat fight. This approach is appropriate to large-scale, long duration operations with a large specialist presence.

b. **Information is the key to defeating/mitigating the adversaries' use of IEDs.** A proactive IED defeat operation requires timely, actionable intelligence that will enable the JTF commander to focus his efforts on the centers of gravity in the enemy's IED network. As the IED is a tool designed to facilitate the attainment of the enemy's goals and intents, understanding those goals and intents is an essential part of the commander's counter terrorist/insurgency strategy. When developing the picture of how the enemy employs IEDs to effect the strategy, two types of information are critical to the analysis: the enemy's technical capabilities (current and predicted), and his recent methods and attacks. This information allows friendly forces to adjust tactical/individual TTPs, develop personal/vehicle/site protective measures (including improved armor and technical means), conduct trend analysis to facilitate proactive activities by friendly forces, and develop information for directing operations at all echelons against the enemy's IED infrastructure. While specific JTF staffs have the responsibility for collecting, analyzing, and disseminating information on the IED threat, the reality is that every member of the JTF is a potential source of information.

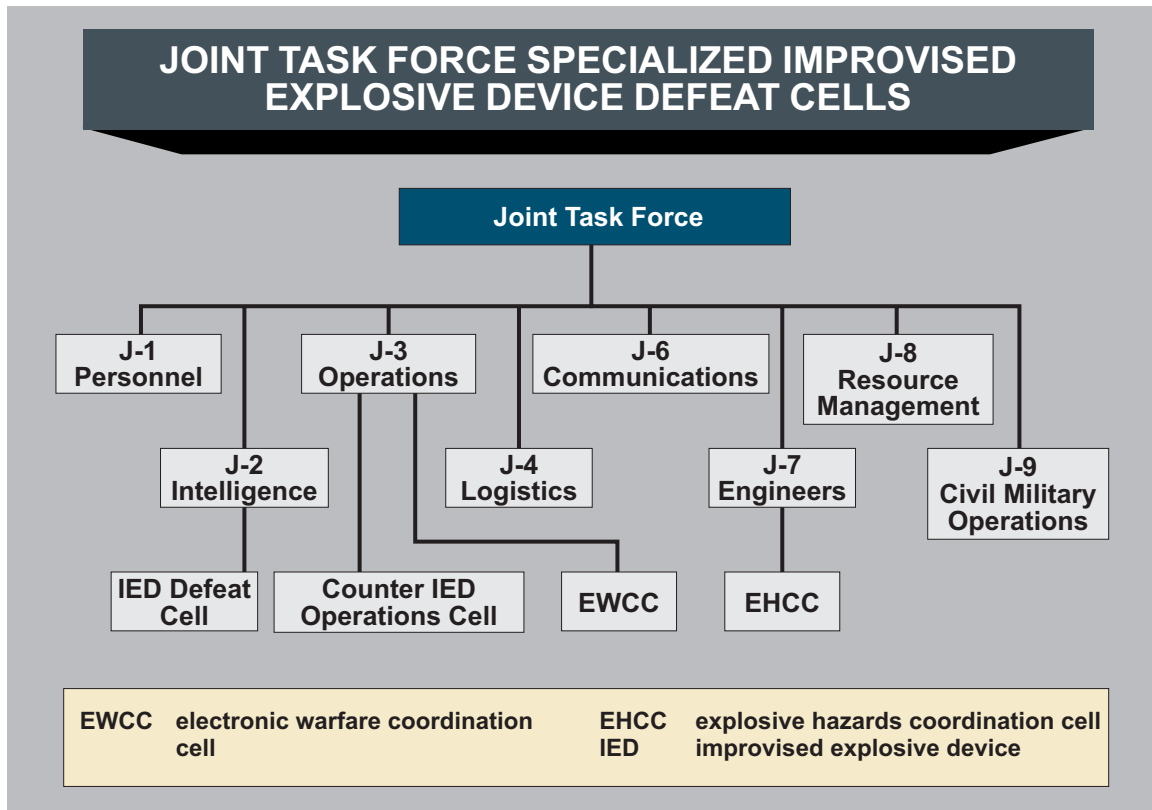


Figure G-4. Joint Task Force Specialized Improved Explosive Device Defeat Cells

5. Joint Task Force Intelligence Directorate in the Improved Explosive Device Fight

a. The J-2 is responsible for organizing and directing the operations of the command's intelligence assets. In the IED fight, the J-2's IED related information sources, within the JOA, will include the JTF organic intelligence assets (all-source, especially human intelligence), HN/coalition sources, unit level reporting, the JTF assigned EOD assets, and national assets (such as, weapons intelligence teams [WITs]) deployed forward to conduct specialized exploitation of IED incidents and devices. In order to manage and exploit this information flow, the J-2 will normally cooperate with a number of boards, cells, and reporting organizations each with a specific focus on some aspect of the IED problem. In order to manage this specialized information flow, the J-2 will create an IED defeat cell, as a part of the corps' all source center, to be the focal point for all IED related reporting from the tactical through strategic levels. The mission of the J-2s' IED defeat cell is to produce and disseminate timely, actionable intelligence that will serve as a basis for the JTF IED defeat operations.

b. The **IED defeat cell**, consisting of intelligence analysis, collection management, and technical specialists, will have the following responsibilities:

(1) Plan the focused employment of intelligence collection assets against the enemy's IED infrastructure. The IEDD collection plan will be integrated into the command's overall intelligence collection plan with the J-2 collection manager conducting actual asset tasking.

(2) Serve as the all source focal point for all IED related intelligence information originating within the JTF and from national and coalition/HN sources.

(3) Conduct predictive trend analysis on enemy IED employment and device design to enhance friendly force protection programs and IED defeat operational planning.

(4) Identify and develop information (target packages) on the critical nodes in the enemy's IED infrastructure to support IED defeat operations.

c. The J-2 will also work closely with and obtain information from some specialized nationally deployed technical exploitation capabilities. This national support, provided by the Defense Intelligence Agency, National Security Agency, and Central Intelligence Agency, enables the J-2 to better define the operational environment and develop actionable intelligence to target the IED support structure. Specific to the IED fight are the combined explosives exploitation cell (CEXC) manned by joint Service EOD personnel and other specialists (based on coalition or other participation), the counter-IED targeting program (CITP) sponsored by the National Ground Intelligence Center (NGIC), and WITs that are deployed to support the JTF's brigade combat teams. Additional support may also be provided by explosive experts, assigned to the CEXC, from the Federal Bureau of Investigation and the Bureau of Alcohol, Tobacco, Firearms, and Explosives. In the IED fight, these elements can provide the following:

(1) Databases that track different types of IEDs and can link an IED to a known or suspected maker based on materials and methods used in its construction.

(2) Analysis of found or captured materials to determine if they are in fact IED precursors.

(3) Analysis of current IED construction and initiation methods.

(4) Prediction of IED trends and likely future construction and initiation methods.

(5) Employment of law enforcement techniques and forensic analysis.

(6) Identification of bomb makers and other support personnel through biometric analysis of IEDs found either before or after detonation.

d. The **NGIC** is a principle contributor of focused technical evaluation of IED devices and developments. NGIC provides all-source analysis of the threat posed by IEDs produced and used by foreign terrorist and insurgent groups. NGIC supports US Army forces during training, operational planning, deployment, and redeployment. NGIC maintains a CITP portal on the SECRET Internet Protocol Router Network website that provides information concerning IED activities and incidents, and NGIC IED assessments. In the IED fight, NGIC increases the capability of the coalition force to collect technical intelligence and provide dedicated intelligence fusion in order to target bomb makers and their networks. NGIC's primary forward information

collectors are the WITs. WITs perform post blast analysis and gather forensic evidence for later technical analysis.

e. The **CEXC** is a joint agency team usually under operational control tasked with the collection and exploitation of IEDs. The Naval EOD Technology Division (NAVEODTECHDIV) is the resource sponsor and force provider for the manning of the core CEXC. When deployed, the CEXC is usually under operational control to the JTF commander but is administratively controlled by NAVTECHDIV. CEXC provides immediate in-theater technical and operational analysis of IEDs, develops measures to counter the bombing campaign, collects and exploits technical intelligence and forensic evidence from explosives related incidents (with major emphasis on IED components), and provides construction and techniques in order to determine enemy tactics, identify trends, and enable both offensive and defensive counter-IED operations by coalition forces. The CEXC obtains its information primarily from its own field teams that deploy to IED events, and from the weapons intelligence and EOD teams that are embedded with the brigade combat teams. Critical tasks include:

- (1) Conducting first-line technical exploitation and evaluation of IEDs and components, and preparing detailed laboratory reports for all exploited material.
- (2) Providing advice on EOD, force protection, and combat tactics in regard to the threat posed by IEDs.
- (3) Attending all significant IED/explosives related incidents.
- (4) Exploiting cache discoveries containing large quantities of military ordnance, bomb-making materials, and/or homemade explosive manufacturing and storage sites.
- (5) Exploiting any incident site where the employment of law enforcement techniques and analysis is important.
- (6) Providing detailed field forensics analysis for targeting.
- (7) Preparing, publishing, and disseminating throughout theater a comprehensive report for every incident attended and a weekly report summarizing IED incident statistics, significant events, and recovered devices for the last seven days.
- (8) Preparing, publishing, and disseminating throughout theater spot reports and technical bulletins for rapidly emerging threats, significant incidents, and newly seen devices.
- (9) Providing technical assistance to support the interrogation of IED-related detainees.
- (10) Providing technical advice on force protection issues and counter-IED TTP.
- (11) Providing assistance for operations against suspected bomb makers and transporters, IED factories, storage locations, and training sites.

(12) Providing briefings, component familiarization, personnel, and subject matter experts’ support.

f. The key to a successful IED defeat effort is in establishing an information sharing infrastructure that can be quickly accessed by any element within the JTF or which supports the JTF. From the lowest level unit reporting that influences day to day TTP modifications, to the strategic level forensic analysis that targets critical nodes in the IED support infrastructure, information must be passed seamlessly and in a timely manner to all interested users. The commander should also establish a uniform command wide reporting policy to ensure that information that is relevant to developing the overall IED environment is not lost. Such a policy could include the use of IED specific standardized reporting formats and dedicated communications linkages for that reporting.

For a detailed discussion of the organization and responsibilities of the JTF see the USJFCOM Handbook, “Organizing for Improvised Explosive Device Defeat (IEDDD) at the Operational Level.”

6. Joint Task Force Operations Directorate in the Improvised Explosive Device Fight

a. The **J-3** is responsible for the direction of the JTF combat forces. In the IED defeat fight, the J-3 normally exercises operational control over attached EOD battalions/units (see Figure G-5). The J-3 ensures that sufficient, properly equipped EOD assets are available to support the JTF’s mission within the JOA. Conventional EOD battalion assets can be deployed to provide area coverage or be specifically assigned to support a brigade combat team. EOD teams are capable of:

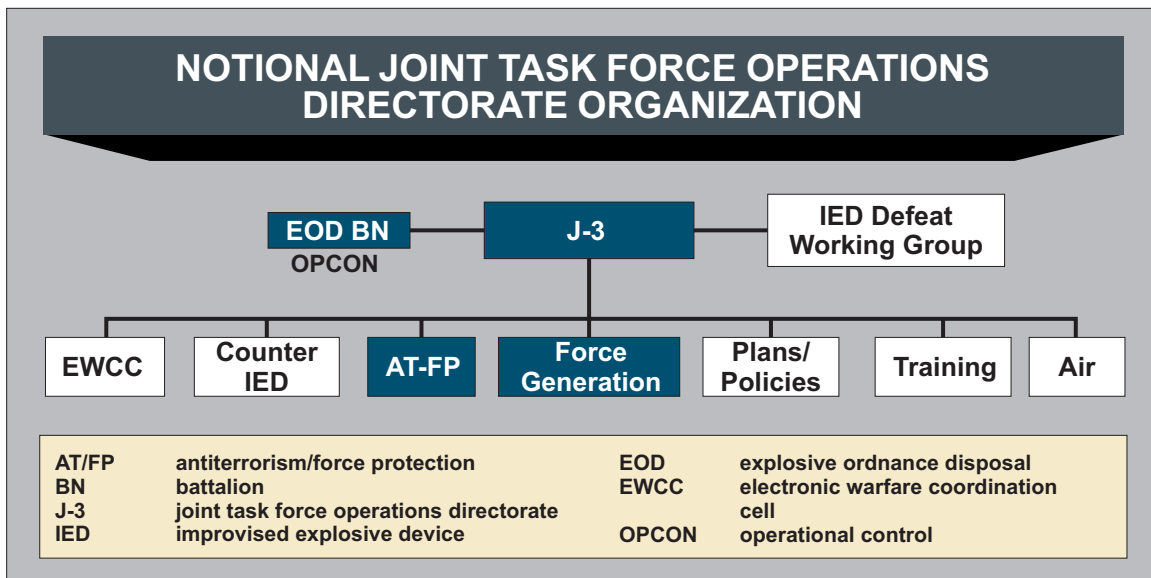


Figure G-5. Notional Joint Task Force Operations Directorate Organization

(1) Identifying and rendering safe and disposing of conventional and unconventional explosives or CBRN munitions or devices (US or foreign origin), to include IEDs. (EOD units are the only forces trained and equipped to render safe and dispose of IEDs.)

(2) Maintaining an EOD incident database, located in the force protection cell.

(3) Providing technical expertise to the EHCC and the explosive hazard teams (EHTs) on explosive hazards.

(4) Acting as the commander's subject matter expert for explosive hazards (IEDs and UXOs).

(5) Conducting post blast and crater analysis.

b. EOD team reporting on and recovery of IED's are an essential part of the overall effort to develop a detailed forensic database to target centers of gravity in the IED system. EOD team reporting is shared within all levels of the JTF. In addition to developing actionable intelligence to support future operations, EOD reporting has an immediate impact on refining unit level force protection related TTPs.

c. The J-3 can also establish additional specialized cells to manage portions of the IED defeat fight. These cells can include an electronic warfare coordination cell, which oversees the employment of electronic warfare assets in support of IED defeat operations.

d. Lastly, depending on the JFC's requirements, the J-3 can chair an **IED defeat working group**. The IED defeat working group, consisting of representatives from the J-2, J-2 (Collection Management, Plans), J-6 (Communications), J-7 (Engineer), J-3 (Plans, Operations), EOD battalion, and other members as required, is tasked to work specific issues related to the IED defeat OPLANS. These issues can include developing major refinements to the IED defeat OPLANS to developing the command response to major developments in the enemy's employment of IEDs. While the working group usually focuses on a specific IED related issue of significant importance to the JTF, it can become a standing body to establish, and manage the JTF's overall IED defeat initiatives.

For a detailed discussion of the organization and responsibilities of the JTF see the USJFCOM Handbook, "Organizing for Improvised Explosive Device Defeat (IEDD) at the Operational Level."

7. Joint Task Force Engineering Directorate in the Improvised Explosive Device Fight

a. The J-7 coordinates combat, general and, in coordination with the J-2, geospatial engineering requirements for the combined/joint force. The J-7 provides engineer expertise to many of the JTF commander's boards, centers, and cells. In the IED defeat fight, the J-7 establishes the EHCC to advise the combined/joint force on developments in enemy IED employment and

potential friendly countermeasures. The EHCC's mission is to enable the land component commander to predict, track, distribute information on, and mitigate explosive hazards within the theater that affect force application, focused logistics, protection, and operational environment awareness. It establishes and maintains an explosive hazard database, conducts pattern analysis, and investigates mines, IED strikes, and UXO hazard areas. The cell provides technical advice on the protection of explosive hazards, including the development of TTPs, and provides training updates to field units. It coordinates EHTs. The EHCC's capabilities include:

- (1) Establishing, maintaining, and sharing the explosive hazard tracking database within the JOA.
- (2) Ensuring accuracy of explosive hazard information distribution via the battle command system.
- (3) Coordinating site evaluations and/or strike incident investigations at four sites simultaneously or conducting unit training at four sites simultaneously.
- (4) Assisting ISR planners with explosive hazard pattern analysis and intelligence collection management.
- (5) Coordinating technical and tactical training for the BCTs by the EHTs.
- (6) Providing updated TTP and guidance for route and area clearance operations.
- (7) Ensuring explosive hazard information compatibility with COP database and display capabilities.

b. The primary operating element of the J-7 in the IED defeat fight are the EHTs. The EHTs provide evaluation of explosive hazards incident sites in support of BCTs and joint, and multinational brigade-sized units and smaller. EHT capabilities include:

- (1) Conducting site evaluation of explosive hazards incident sites, to include CEA, multiple UXO, and post-blast analysis.
- (2) Conducting TTP training for BCT and joint, interagency, and multinational personnel on explosive hazard protection in a JOA.
- (3) Conducting annual recertification, quarterly reinforcement, and pre-deployment training.
- (4) Providing advice on explosive hazards as requested.
- (5) Providing information into the explosive hazard database via the battle command system.

(6) Conducting disposal of limited explosive hazards; however, EHTs are not equipped to conduct render safe procedures on explosive hazards.

(7) Consolidating and conducting analysis of requests for modifications to the JOA UXO supplemental list.

(8) Providing recommendations to the CBRN cell for modification of the JOA UXO supplemental list.

APPENDIX H REFERENCES

The development of JP 3-15 is based upon the following primary references.

1. Executive Documents

Title 10, USC.

2. Chairman of the Joint Chiefs of Staff Publications

a. CJCS Instruction 3150.25B, *CJCS Joint Lessons Learned Program (JLLP)*.

b. CJCS Instruction 3207.01A, *Military Support to Humanitarian Mine Action Operations*.

c. CJCS Manual 3122.03A, *Joint Operation Planning and Execution System Volume II: Planning Formats*.

d. CJCS Manual 6120.05, *Manual for Tactical Command and Control Planning Guidance for Joint Operations - Joint Interface Operational Procedures for Message Text Formats*.

e. JP 1, *Doctrine for the Armed Force of the United States*.

f. JP 2-01.3, *Joint Intelligence Preparation of the Operational Environment*.

g. JP 2-03, *Geospatial Intelligence Support to Joint Operations*.

h. JP 3-0, *Joint Operations*.

i. JP 3-05.1, *Joint Special Operations Task Force Operations*.

j. JP 3-13, *Information Operations*.

k. JP 3-34, *Joint Engineer Operations*.

l. JP 3-59, *Meteorological and Oceanographic Operations*.

3. Multi-Service Publications

a. FM 3-100.38, MCRP 3-17.2B, NTTP 3-02.4.1, AFTTP(I) 3-2.12, *Multi-Service Tactics, Techniques, and Procedures for Unexploded Explosive Ordnance Operations*.

b. FMI 3-34.119, MCIP 3-17.01, *Improvised Explosive Device Defeat*.

c. FM 21-16, MCRP 3-17.2A, *Unexploded (UXO) Ordnance Procedures*.

d. FM 3-90.12/MCWP 3-17.1, *Combined Arms Gap Crossing Operations*.

- e. FM 3-34.300/MCWP 17.6, *Survivability Operations*.
- f. FM 3-34.214, *Explosives and Demolitions*.

4. US Army Publications

- a. FM 3-06.11, *Combined Arms Operations in Urban Terrain*.
- b. FM 3-34, *Engineer Operations*.
- c. FM 3-34.210, *Explosive Hazards Operations*.
- d. FM 3-34.22, *Engineer Operations - Brigade Combat Team and Below*.
- e. FM 3-90.6, *The Brigade Combat Team*.
- f. FM 3-90.11, *Combined Arms Mobility Operations*.
- g. FM 3-90.61, *Brigade Special Troops Battalion*.
- h. FM 90-7, *Combined Arms Obstacle Integration*.

5. US Marine Corps Publications

- a. MCWP 3-17.3, *MAGTF Breaching Operations*.
- b. MCWP 5-12.1, *The Commander's Handbook on the Law of Naval Operations*.
- c. Marine Tactical Publication 6 Volume II, *Naval Mine Countermeasures Operations Planning and Evaluation*.
- d. Marine Tactical Publication 24 Volume I, *Naval Mine Countermeasures Tactics and Execution*.

6. US Navy Publications

- a. NWP 3-02.4, *Explosive Ordnance Disposal*.
- b. NWP 3-05, *Naval Special Warfare*.
- c. NWP 3-15, *Naval Mine Warfare*.
- d. NWP 3-15.1, *Maritime Mining*.
- e. NWP 3-15.21, *Surface Mine Countermeasures (SMCM) Operations*.
- f. NTP 3-15.22, *Airborne Mine Countermeasures (AMCM)*.

- g. NTTP 3-15.23, *Underwater Mine Countermeasures (UMCM)*.
- h. NWP 3-15.26, *Passive Mine Countermeasures System and Tactics*.
- i. NWP 3-15.31, *Submarine Special Operations Manual, Mining*.
- j. NWP 3-15.41, *Mine Countermeasures Planning and Procedures (General Instructions)*.
- k. NWP 3-15.41.1, *Mine Countermeasures Planning and Procedures (Data Appendices)*.
- l. NWP 3-15.41.2, *Mine Countermeasures Planning and Procedures (Data Supplement)*.

7. Other Publications

- a. Variable Message Format (VMF) Message Number K05.16, *Land Minefield Laying Report, TIDP-TE, Volume III, Annex A*.
- b. TC 20-32-3, *Foreign Mine Handbook (Balkan States)*.
- c. TC 20-32-4, *Foreign Mine Handbook (Asia)*.
- d. TC 20-32-5, *Commander's Reference Guide: Land Mine and Explosives Hazards (Iraq)*.
- e. ATP 1 (C), *Volume I, Allied Maritime Tactical Instructions*.
- f. ATP 1 (C) Volume II, *Allied Maritime Tactical Instructions and Procedures*.
- g. APP-4, *Allied Formatted and Standard Messages*.
- h. ATP 6A (Navy) (Air), *Volume I, Allied Doctrine of Mine Warfare, Policies, 1, and Principles*.
- i. ATP 24 (A) (Navy), *Tactical Instructions and Procedures for the Conduct of Mine Warfare Operations*.
- j. STANAG 2036, *Land Minefield Laying, Marking, Recording and Reporting Procedures*.
- k. STANAG 2430, *Land Force Combat Engineer Messages, Reports, and Returns (AEngrP-2)*.
- l. STANAG 2485, *Countermine Operations*.
- m. USJFCOM Handbook, *Organizing for Improvised Explosive Device Defeat (IEDD) at the Operational Level*.

Intentionally Blank

APPENDIX J ADMINISTRATIVE INSTRUCTIONS

1. User Comments

Users in the field are highly encouraged to submit comments on this publication to: Commander, United States Joint Forces Command, Joint Warfighting Center, ATTN: Joint Doctrine Group, 116 Lake View Parkway, Suffolk, VA 23435-2697. These comments should address content (accuracy, usefulness, consistency, and organization), writing, and appearance.

2. Authorship

The lead agent for this publication is the US Army. The Joint Staff doctrine sponsor for this publication is the Joint Staff Logistics Directorate (J-4).

3. Supersession

This publication supersedes JP 3-15, 24 February 1999, *Joint Doctrine for Barriers, Obstacles, and Mine Warfare*.

4. Change Recommendations

a. Recommendations for urgent changes to this publication should be submitted:

TO: CSA WASHINGTON DC//DAMO-FDQ//
INFO: JOINT STAFF WASHINGTON DC//J7-JEDD//
CDRUSJFCOM SUFFOLK VA//JT10//

Routine changes should be submitted electronically to Commander, Joint Warfighting Center, Joint Doctrine Group and info the Lead Agent and the Director for Operational Plans and Joint Force Development J-7/JEDD via the CJCS JEL at <http://www.dtic.mil/doctrine>.

b. When a Joint Staff directorate submits a proposal to the Chairman of the Joint Chiefs of Staff that would change source document information reflected in this publication, that directorate will include a proposed change to this publication as an enclosure to its proposal. The Military Services and other organizations are requested to notify the Joint Staff/J-7 when changes to source documents reflected in this publication are initiated.

c. Record of Changes:

CHANGE NUMBER	COPY NUMBER	DATE OF CHANGE	DATE ENTERED	POSTED BY	REMARKS
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

5. Distribution of Publications

Local reproduction is authorized and access to unclassified publications is unrestricted. However, access to and reproduction authorization for classified joint publications must be in accordance with DOD Regulation 5200.1-R, *Information Security Program*.

6. Distribution of Electronic Publications

a. Joint Staff J-7 will not print copies of JPs for distribution. Electronic versions are available at www.dtic.mil/doctrine (NIPRNET), and <http://nmcc20a.nmcc.smil.mil/dj9j7ead/doctrine/> (SIPRNET), or on JDEIS at <https://jdeis.js.mil> (NIPRNET), and <https://jdeis.js.smil.mil> (SIPRNET).

b. Only approved joint publications and joint test publications are releasable outside the combatant commands, Services, and Joint Staff. Release of any classified joint publication to foreign governments or foreign nationals must be requested through the local embassy (Defense Attaché Office) to DIA Foreign Liaison Office, PO-FL, Room 1E811, 7400 Pentagon, Washington, DC 20301-7400.

c. JEL CD-ROM. Upon request of a JDDC member, the Joint Staff J-7 will produce and deliver one CD-ROM with current joint publications. This JEL CD-ROM will be updated not less than semiannually and when received can be locally reproduced for use within the combatant commands and Services.

GLOSSARY

PART I — ABBREVIATIONS AND ACRONYMS

AFTTP(I)	Air Force tactics, techniques, and procedures (instruction)
AHD	antihandling device
AMC	Air Mobility Command
AMCM	airborne mine countermeasures
AOA	amphibious objective area
AP	antipersonnel
APL	antipersonnel land
APP	allied procedural publication
ASD(SO/LIC)	Assistant Secretary of Defense (Special Operations and Low-Intensity Conflict)
AT	antitank
ATF	amphibious task force
ATP	allied tactical publication
BCT	brigade combat team
C2	command and control
CA	civil affairs
CATF	commander, amphibious task force
CBRN	chemical, biological, radiological, and nuclear
CCW	Convention on Conventional Weapons
CEA	captured enemy ammunition
CEXC	combined explosives exploitation cell
CITP	counter-IED targeting program
CJCS	Chairman of the Joint Chiefs of Staff
CLF	commander, landing force
CLZ	craft landing zone
COA	course of action
CONOPS	concept of operations
COP	common operational picture
CS	combat support
CTU	commander, task unit
DOD	Department of Defense
DOS	Department of State
DSCA	Defense Security Cooperation Agency
EH	explosive hazard
EHCC	explosive hazards coordination cell
EHT	explosive hazard team
EOD	explosive ordnance disposal

ERT	engineer reconnaissance team
FM	field manual
FMI	field manual-interim
HBCT	heavy brigade combat team
HDM	humanitarian demining
HMA	humanitarian mine action
HN	host nation
HWM	high water mark
IBCT	infantry brigade combat team
IED	improvised explosive device
IEDD	improvised explosive device defeat
IO	information operations
ISR	intelligence, surveillance, and reconnaissance
IWG	interagency working group
J-2	intelligence staff section
J-3	operations staff section
J-7	engineering staff section
JFACC	joint force air component commander
JFC	joint force commander
JFMCC	joint force maritime component commander
JOA	joint operations area
JOPP	joint operation planning process
JP	joint publication
JTCB	joint targeting coordination board
JTF	joint task force
K-Kill	catastrophic kill
LF	landing force
LHA	amphibious assault ship (general purpose)
LHD	amphibious assault ship (dock)
LOC	line of communications
LPD	amphibious transport dock
LZ	landing zone
MA	military action
MAGTF	Marine air-ground task force
MCIP	Marine Corps information publication
MCM	mine countermeasures
MCMC	mine countermeasures commander
MCMOPS	mine countermeasures operations

MCMREP	mine countermeasure report
MCRP	Marine Corps reference publication
MCWP	Marine Corps warfighting publication
MEDAL	Mine Warfare Environmental Decision Aids Library
METT-T	mission, enemy, terrain and weather, troops and support available — time available
MIL-STD	military standard
MIW	mine warfare
M-Kill	mobility kill
MLAYREP	mine laying report
MOE	measure of effectiveness
MP	military police
MPSRON	maritime pre-positioning ships squadron
NATO	North Atlantic Treaty Organization
NAVEODTECHDIV	Naval Explosives Ordnance Disposal Technology Division
NGIC	National Ground Intelligence Center
NMAWC	Naval Mine and Anti-Submarine Warfare Command
NSCT1	Naval Special Clearance Team One
NTTP	Navy tactics, techniques, and procedures
NWP	Naval warfare publication
OBSTINTEL	obstacle intelligence
OPGEN	operational general
OPLAN	operation plan
OPORD	operation order
OPTASK	operation task
PIR	priority intelligence requirement
PSYOP	psychological operations
RCT	regimental combat team
REMUS	remote environmental monitoring unit system
ROE	rules of engagement
SBCT	Stryker brigade combat team
SCATMINE	scatterable mine
SCATMINEWARN	scatterable minefield warning
SecDef	Secretary of Defense
SG	strike group
SLOC	sea line of communications
SMCM	surface mine countermeasures
SOF	special operations forces
SoO	ship of opportunity

Glossary

SOP	standard operating procedure
SPOTREP	spot report
SSN	attack submarine, nuclear
STANAG	standardization agreement
SZ	surf zone
TC	training circular
TTP	tactics, techniques, and procedures
UMCM	underwater mine countermeasures
UN	United Nations
US	United States
USA	United States Army
USAF	United States Air Force
USC	United States Code
USCG	United States Coast Guard
USG	United States Government
USJFCOM	United States Joint Forces Command
USMC	United States Marine Corps
USMTF	United States message text format
USN	United States Navy
USNORTHCOM	United States Northern Command
USPACOM	United States Pacific Command
UXO	unexploded explosive ordnance
WIT	weapons intelligence team
WMD	weapons of mass destruction

PART II — TERMS AND DEFINITIONS

Unless otherwise annotated, this publication is the proponent for all terms and definitions found in the glossary. Upon approval, JP 1-02 will reflect this publication as the source document for these terms and definitions.

barrier. A coordinated series of obstacles designed or employed to channel, direct, restrict, delay, or stop the movement of an opposing force and to impose additional losses in personnel, time, and equipment on the opposing force. Barriers can exist naturally, be man-made, or a combination of both. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

barrier, obstacle, and mine warfare plan. A comprehensive, coordinated plan which includes responsibilities, general location of unspecified and specific barriers, obstacles, and minefields; special instructions; limitations; coordination; and completion times. The plan may designate locations of obstacle zones or belts. It is normally prepared as an annex to a campaign plan, operation plan, or operation order. (JP 3-15)

bottom mine. A mine with negative buoyancy which remains on the seabed. Also called ground mine. (JP 3-15)

conventional mines. Land mines, other than nuclear or chemical, that are not designed to self-destruct. They are designed to be emplaced by hand or mechanical means. Conventional mines can be buried or surface laid and are normally emplaced in a pattern to aid in recording. (JP 3-15)

countermining. None. (Approved for removal from the next edition of JP 1-02.)

denial measure. An action to hinder or deny the enemy the use of territory, personnel, or facilities. It may include destruction, removal, contamination, or erection of obstructions. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

explosive hazard. Any hazard containing an explosive component. Explosive hazards include unexploded explosive ordnance (including land mines), booby traps (some booby traps are nonexplosive), improvised explosive devices (which are an improvised type of booby trap), captured enemy ammunition, and bulk explosives. Also called EH. (Approved for inclusion in the next edition of JP 1-02.)

humanitarian mine action. Activities that strive to reduce the social, economic, and environmental impact of land mines, unexploded ordnance and small arms ammunition – also characterized as explosive remnants of war. (Approved for inclusion in the next edition of JP 1-02.)

improvised explosive device. A device placed or fabricated in an improvised manner incorporating destructive, lethal, noxious, pyrotechnic, or incendiary chemicals and designed to destroy,

incapacitate, harass, or distract. It may incorporate military stores, but is normally devised from nonmilitary components. Also called IED. (JP 3-07.2)

influence mine. A mine actuated by the effect of a target on some physical condition in the vicinity of the mine or on radiations emanating from the mine. (JP 3-15)

magnetic mine. A mine which responds to the magnetic field of a target. (JP 3-15)

mine. 1. In land mine warfare, an explosive or other material, normally encased, designed to destroy or damage ground vehicles, boats, or aircraft, or designed to wound, kill, or otherwise incapacitate personnel. It is designed to be detonated by the action of its victim, by the passage of time, or by controlled means. 2. In naval mine warfare, an explosive device laid in the water with the intention of damaging or sinking ships or of deterring shipping from entering an area. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

mine countermeasures. All methods for preventing or reducing damage or danger from mines. Also called MCM. (JP 3-15)

minefield. 1. In land warfare, an area of ground containing mines emplaced with or without a pattern. 2. In naval warfare, an area of water containing mines laid with or without a pattern. (JP 3-15)

minefield record. A complete written record of all pertinent information concerning a minefield, submitted on a standard form by the officer in charge of the laying operations. (JP 3-15)

minefield report. An oral, electronic, or written communication concerning mining activities (friendly or enemy) submitted in a standard format by the fastest secure means available. (JP 3-15)

minehunting. Employment of sensor and neutralization systems, whether air, surface, or subsurface, to locate and dispose of individual mines. Minehunting is conducted to eliminate mines in a known field when sweeping is not feasible or desirable, or to verify the presence or absence of mines in a given area. (JP 3-15)

minesweeping. The technique of clearing mines using either mechanical, explosive, or influence sweep equipment. Mechanical sweeping removes, disturbs, or otherwise neutralizes the mine; explosive sweeping causes sympathetic detonations in, damages, or displaces the mine; and influence sweeping produces either the acoustic and/or magnetic influence required to detonate the mine. (JP 3-15)

mine warfare. The strategic, operational, and tactical use of mines and mine countermeasures. Mine warfare is divided into two basic subdivisions: the laying of mines to degrade the enemy's capabilities to wage land, air, and maritime warfare; and the countering of enemy-laid mines to permit friendly maneuver or use of selected land or sea areas. Also called MIW. (JP 3-15)

moored mine. A contact or influence-operated mine of positive buoyancy held below the surface by a mooring attached to a sinker or anchor on the bottom. (JP 3-15)

obstacle. Any obstruction designed or employed to disrupt, fix, turn, or block the movement of an opposing force, and to impose additional losses in personnel, time, and equipment on the opposing force. Obstacles can exist naturally or can be man-made, or can be a combination of both. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

obstacle intelligence. Those collection efforts to detect the presence of enemy (and natural) obstacles, determine their types and dimensions, and provide the necessary information to plan appropriate combined arms breaching, clearance, or bypass operations to negate the impact on the friendly scheme of maneuver. It is typically related to the tactical level of intelligence. Also called OBSTINTEL. (Approved for inclusion in the next edition of JP 1-02.)

obstacle zone. A division-level command and control measure, normally done graphically, to designate specific land areas where lower echelons are allowed to employ tactical obstacles. (JP 3-15)

offensive minefield. In naval mine warfare, a minefield laid in enemy territorial water or waters under enemy control. (JP 3-15)

phony minefield. An area free of live mines used to simulate a minefield, or section of a minefield, with the object of deceiving the enemy. (This term and its definition modify the existing term “phoney minefield” and its definition and are approved for inclusion in the next edition of JP 1-02.)

pressure mine. 1. In land mine warfare, a mine whose fuse responds to the direct pressure of a target.
2. In naval mine warfare, a mine whose circuit responds to the hydrodynamic pressure field of a target. (JP 3-15)

proofing. The verification that a breached lane is free of live mines by passing a mine roller or other mine-resistant vehicle through as the lead vehicle. (JP 3-15)

protective minefield. 1. In land mine warfare, a minefield employed to assist a unit in its local, close-in protection. 2. In naval mine warfare, a minefield laid in friendly territorial waters to protect ports, harbors, anchorages, coasts, and coastal routes. (JP 3-15)

Q-route. A system of preplanned shipping lanes in mined or potentially mined waters used to minimize the area the mine countermeasures commander has to keep clear of mines in order to provide safe passage for friendly shipping. (JP 3-15)

reduction. The creation of lanes through a minefield or obstacle to allow passage of the attacking ground force. (JP 3-15)

reinforcing obstacles. Those obstacles specifically constructed, emplaced, or detonated through military effort and designed to strengthen existing terrain to disrupt, fix, turn, or block enemy movement. (JP 3-15)

reserved obstacles. Those demolition obstacles that are deemed critical to the plan for which the authority to detonate is reserved by the designating commander. (JP 3-15)

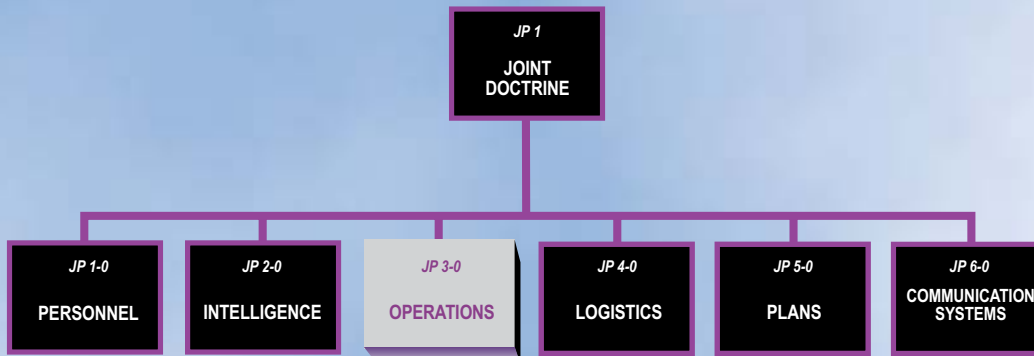
scatterable mine. In land mine warfare, a mine laid without regard to classical pattern and which is designed to be delivered by aircraft, artillery, missile, ground dispenser, or by hand. Once laid, it normally has a limited life. (JP 3-15)

ship counter. In naval mine warfare, a device in a mine which prevents the mine from detonating until a preset number of actuations has taken place. (JP 3-15)

tactical obstacles. Those obstacles employed to disrupt enemy formations, to turn them into a desired area, to fix them in position under direct and indirect fires, and to block enemy penetrations. (JP 3-15)

unexploded explosive ordnance. Explosive ordnance which has been primed, fused, armed or otherwise prepared for action, and which has been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material and remains unexploded either by malfunction or design or for any other cause. Also called UXO. (JP 3-15)

JOINT DOCTRINE PUBLICATIONS HIERARCHY



All joint publications are organized into a comprehensive hierarchy as shown in the chart above. **Joint Publication (JP) 3-15** is in the **Operations** series of joint doctrine publications. The diagram below illustrates an overview of the development process:

