# Joint Publication 3-15

# Barriers, Obstacles, and Mine Warfare for Joint Operations

06 September 2016

# PREFACE

## 1. Scope

This publication provides guidance to plan and execute barrier, obstacle, and mine warfare for joint operations.

## 2. Purpose

This publication has been prepared under the direction of the Chairman of the Joint Chiefs of Staff (CJCS). It sets forth joint doctrine to govern the activities and performance of the Armed Forces of the United States in joint operations, and it provides considerations for military interaction with governmental and nongovernmental agencies, multinational forces, and other interorganizational partners. 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 and executing their plans and orders. 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 objectives.

## 3. Application

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

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 CJCS, 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 US, 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:

KEVIN D. SCOTT
Vice Admiral, USN
Director, Joint Force Development

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# SUMMARY OF CHANGES
## REVISION OF JOINT PUBLICATION 3-15
## DATED 17 JUNE 2011

- **Provides clarity on US landmine policy, to include employment and training of anti-personnel landmines on and off the Korean Peninsula.**

- **Redefines the term "render safe" to align and comply with US policy and treaty requirements.**

- **Provides clarity and differentiation between joint intelligence preparation of the operational environment and intelligence preparation of the battlespace.**

- **Provides legal accuracy and clarity to discussion on "military gain" and "legality of incidental destruction of civilian property" with regard to the law of war.**

- **Provides clarity of the term "military deception" to align with Joint Publication 3-13.4, *Military Deception*, and deletes discussion on the two basic approaches to deception.**

- **Modifies the definition and description of obstacle intelligence to provide clarity and align with existing doctrine.**

- **Updates chemical, biological, radiological, and nuclear reconnaissance and surveillance capability.**

- **Provides clarity of civil affair activities and considerations in support of civil-military operations to align with doctrine.**

- **Provides legal accuracy and clarity of authority for humanitarian mine action.**

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# EXECUTIVE SUMMARY
## COMMANDER'S OVERVIEW

- **Provides a framework to employ and counter obstacles**
- **Outlines the role of obstacles in joint operations**
- **Discusses US law and policy concerning landmines and humanitarian demining**
- **Discusses the framework to plan and conduct land operations to minimize the impact from barriers, obstacles, and landmines, and to synchronize their employment**
- **Outlines the strategic, operational, and tactical employment of sea mines and mine countermeasures**

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### Introduction

***Operational Framework***

In major operations and campaigns, and some crisis response and limited contingency operations, joint forces use obstacles offensively and defensively to attack the mobility of adversaries, enhance the effectiveness of friendly fires, deny adversaries the use of terrain, disrupt sustainment operations, and inflict damage to enemy forces.

Joint forces must assure their mobility, conserve their fighting potential, and protect their ability to provide personnel, logistics, and other support. They predict and prevent enemy use of obstacles, detect their existence, avoid them, neutralize them, and protect against their effects.

***Assured Mobility***

Assured mobility is the framework of processes, actions, and capabilities that enable the joint force to deploy and maneuver where and when desired, without interruption or delay, to accomplish the mission. Assured mobility is the commander's responsibility and is achieved through proactive mobility, countermobility, and survivability. While focused primarily on the joint function of movement and maneuver, assured mobility has links to

each of the joint functions and enables and is enabled by those functions.

The fundamentals of assured mobility are to:

- **Predict.** Engineers and planners should predict potential enemy impediments to joint force mobility by analyzing the enemy's tactics, techniques, and procedures; capability; and evolution.

- **Detect.** Engineers and planners use intelligence, surveillance, and reconnaissance assets to identify the location of natural and man-made obstacles, prepare to create/emplace obstacles, and identify potential means for obstacle creation.

- **Prevent.** Engineers and other planners apply this fundamental by limiting the enemy's ability to influence mobility through proactive measures before the obstacles are emplaced or activated.

- **Avoid.** If prevention fails, the commander will maneuver forces to avoid impediments to mobility within the scheme of maneuver.

- **Neutralize.** Engineers and other staff elements plan to neutralize, reduce, or overcome obstacles and impediments to increase freedom of movement.

- **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.

- **Respond.** Response must be scalable, flexible, and adaptable to operational capabilities, including a well-developed public information and information operations component.

***Legal Considerations***

The use of some obstacles, specifically mines, is governed by international laws, treaties, and agreements, as well as by US law and policy. The US regards mines as lawful weapons when they are employed in

accordance with US law and policy. The US is not an official party to the Ottawa Convention, but on 23 September 2014 announced it was aligning its antipersonnel land mine (APL) policy outside the Korean Peninsula with the key requirements of the Ottawa Convention. US policy also governs some demining operations. In conducting mining operations, joint forces use the Chairman of the Joint Chiefs of Staff standing rules of engagement (ROE) in the development of ROE to ensure their actions are consistent with such laws and policies.

## Joint Planning Considerations

***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 host nation permission and presidential authorization. US joint forces will only employ nonpersistent mines that are authorized for employment in their operational area in accordance with US law and policy.

***Barrier, Obstacle, and Minefield Levels of Employment***

**Strategic Employment.** Before hostilities, barriers, obstacles, and minefields can be used as flexible deterrent options without posing an offensive threat. Defensive employment along a hostile land border can demonstrate friendly resolve. Pre-hostility employment will be as directed by the President. Presidential determination will be based, in part, on diplomatic conditions and on concurrence by affected friendly nations.

**Operational Employment.** At the operational level, the primary use of obstacles is to restrict enemy maneuver options or to create friendly maneuver options. Offensive employment can protect friendly maneuver while disrupting the enemy's ability to concentrate or maneuver forces.

**Tactical Employment.** The employment of barriers, obstacles, and minefields at the tactical level is normally done to achieve offensive or defensive objectives to include enhancement of friendly direct/indirect fires,

delay/destroy enemy formations, or as an economy of force technique.

***Planning Sequence***

The joint planning process (JPP) underpins planning at all levels and missions. The primary steps of JPP are:

- **Planning Initiation.** JPP begins when an appropriate authority recognizes a potential for military capability to be employed in response to a potential or actual crisis.

- **Mission Analysis.** 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; logistics priorities; ROE; and the employment of obstacles and minefields to support denial operations.

- **Course of Action (COA) Determination.** During COA determination, the joint force commander's (JFC's) staff initially assesses the terrain, weather, and climate to identify existing operational-level barriers, obstacles, and limits imposed by expected weather.

- **Plan or Order Development.** During concept of operations 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.

***Planning Support***

Planning for operations involving barrier, obstacle, and mine warfare (MIW) requires timely, continuous, and reliable all-source intelligence support. To support the planning process, commanders and staffs often require a variety of intelligence and engineer products that are available from a number of different intelligence and other organizations.

Planning for the use of barriers, obstacles, and mines involves the acquisition, storage, maintenance, distribution, and security of the materiel. Logistics 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.

Planning for and employing barriers, obstacles, and mines requires communication to facilitate joint and multinational coordination and information flow to inform friendly forces (and, when necessary, other United States Government departments and agencies, international organizations, and nongovernmental organizations, as well as civilians) of locations. For operations outside the Korean Peninsula, provide guidance and direction on command and control with respect to APL employment by partner nations who are not party to the Ottawa Convention so as to not violate US policy contained in Presidential Policy Directive-37, *US Landmine Policy*.

## Land Operations

***Support to Movement and Maneuver***

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.

***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 scatterable mines/networked munitions is included within countermobility operations. At the tactical level, mobility and countermobility operations are typically supported by combat engineers as combat engineering tasks.

***Command and Control (C2)***

**Planning.** At the tactical level, commanders focus on identifying the scheme of maneuver that must be supported by mobility and/or countermobility efforts. At the operational level, countermobility planning focuses on granting obstacle emplacement authority or providing obstacle control. At each level, commanders include obstacle planning in the decision-making process.

**Reconnaissance** is performed before, during, and after mobility operations to provide information used in the planning process, as well as by the commander and staff to formulate, confirm, or modify the COA.

**Control Means.** The purpose of obstacle control is to synchronize subordinate obstacle efforts with the commander's intent and scheme of maneuver. Commanders exercise obstacle control by granting or withholding obstacle emplacement authority or restricting obstacles through orders or other specific guidance.

### Maritime Operations

Naval MIW consists of the strategic, operational, and tactical employment of sea mines and mine countermeasures (MCM). MIW is divided into two categories: the emplacement of mines to degrade the enemy's capabilities to wage land, air, and maritime warfare, and the countering of enemy mining capability or emplaced mines in order to permit friendly maneuver.

Naval MIW employs a broad approach, incorporating offensive and defensive aspects of MIW. National and military objectives can sometimes be achieved without clearing or even breaching adversary minefields. If US forces can prevent mines from being employed, bypass adversary minefields, or restrict the enemy to deploying only tactically insignificant minefields, then US objectives are more easily achieved.

***Naval Mine Warfare C2***

Mine warfare commander (MIWC) is a supporting warfare commander to the Navy component commander or the officer in tactical command and is the commander's primary advisor on all aspects of MIW—both mining and MCM.

Mine countermeasures commander (MCMC) is the supporting commander to the MIWC or designated commander for MCM within an assigned area. Depending on the extent of operations and geography, it is conceivable to have multiple MCMCs under the coordination of a single MIWC.

***Mining Objectives***

US mining can be employed to reduce the adversary's threat to friendly forces and preserve freedom of action.

Mining is essential to other warfare areas, particularly strike, antisubmarine, and antisurface warfare. Sea mines, or the threat of their presence, may restrict enemy use of sea areas vital to their operations. Conversely, mines may be used to protect friendly harbors, channels, and shores. Delays and interruptions in the shipping of war materiel may deprive the enemy of critical offensive and defensive capabilities.

***US Mining Policy***

In war, US policy is to conduct offensive, defensive, and protective mining as necessary. The decision to employ mines is typically made by the combatant commander or higher authority, depending on ROE.

***Mine Countermeasures***

MCM includes all actions to prevent enemy mines from altering friendly forces' maritime plans, operations, or maneuver. MCM reduces the threat of mines and the effects of enemy-emplaced sea mines on friendly naval force and seaborne logistics force access to and transit of selected waterways.

## CONCLUSION

This publication provides guidance to plan and execute barrier, obstacle, and mine warfare for joint operations.

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# 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 barriers and obstacles (including improvised explosive devices [IEDs], mines, and other unexploded explosive ordnance [UXO]) and to conduct mine warfare (MIW), employing mines on land and sea during military operations. In many types of operations, joint forces can employ obstacles as a significant force multiplier. Per Joint Publication (JP) 1, *Doctrine for the Armed Forces of the United States*, the US military recognizes two forms of warfare: traditional and irregular. Other joint doctrine still uses the term warfare in a broader sense to describe activities or operations (e.g., unconventional warfare, anti-submarine warfare, MIW, and electronic warfare). However, these terms are not categorized as alternatives within the traditional and irregular warfare construct, but rather are retained due to their common usage and familiarity.

b. The procedures for employing and countering obstacles on land differ from those at sea. For example, while obstacles on land are primarily employed and countered by combat engineers, this is not the case at sea, where ships, aircraft, and underwater elements deploy and/or counter obstacles, naval mines, and IEDs. This chapter provides a framework to employ and counter obstacles. Considerations that are unique to the land and maritime domains are covered in Chapter III, "Land Operations," and Chapter IV, "Maritime Operations."

**Per Joint Publication 1, *Doctrine for the Armed Forces of the United States,* the US military recognizes two basic forms of warfare: traditional and irregular. Other joint doctrine still uses the term "warfare" in a broader sense to describe activities or operations (e.g., unconventional warfare, anti-submarine warfare, mine warfare, and electronic warfare). However, these terms are not categorized as alternatives within the traditional and irregular warfare construct, but rather are retained due to their common usage and familiarity.**

## 2. Operational Framework

### a. The Role of Obstacles in Joint Operations

(1) During 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 protect personnel, equipment, and facilities and maintain lines of communications

(LOCs). 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 (HCA), 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 use obstacles offensively and defensively to attack the mobility of adversaries, enhance the effectiveness of friendly fires, deny adversaries the use of terrain, disrupt sustainment operations, and inflict damage to enemy forces.

(2) Employing and countering obstacles impacts (or is impacted by) all six of the **joint functions. Command and control (C2)** is critical to ensure that obstacles are integrated into the overall plan and support the concept of operations (CONOPS), comply with law and policy, and avoid unintended consequences. **Intelligence** should provide joint forces with as much information as possible about obstacles—and about adversaries' capabilities to employ them. Political, social, cultural, and economic factors may affect how obstacles will be used. 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 areas 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 predict and prevent enemy use of obstacles, detect their existence, avoid them, neutralize them, and protect 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) Obstacles can create significant advantages for the joint forces within the operational area. Likewise, obstacles can also create challenges that require analysis prior to their emplacement:

(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 enhance and sustain certain effects (i.e., disrupt, fix, turn, and block), obstacles must be observed and covered by fires.

(d) Obstacles can be just as hazardous to friendly forces and civilians as they are to adversaries. Without delay after the cessation of active hostilities, all minefields,

mined areas, mines, booby traps, and other devices shall be cleared, removed, destroyed, or maintained in accordance with US policy and international law.

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

(f) Employment can have an adverse effect on the perception of legitimacy and undermine popular support.

(g) Employment can have an adverse effect on local commerce, which can be detrimental to the restoration of a nation's political and economic system, especially during stability and counterinsurgency operations.

b. **Assured Mobility.** Assured mobility is the framework of processes, actions, and capabilities that enable the joint force to deploy and maneuver where and when desired, without interruption or delay, to accomplish the mission. This construct is one means to enable a joint force to achieve the commander's intent. Assured mobility is the commander's responsibility and is achieved through proactive mobility, countermobility, and survivability. Assured mobility integrates all of the engineer functions and should not be confused with the limited application of the mobility function. While focused primarily on the joint function of movement and maneuver, assured mobility has links to each of the joint functions, and enables and is enabled by those functions. While the joint engineer has the primary staff role in assured mobility, other staff members play critical roles. The fundamentals of assured mobility are:

(1) **Predict.** Engineers and planners should predict potential enemy impediments to joint force mobility by analyzing the enemy's tactics, techniques, and procedures (TTP); capability; and evolution. Prediction requires a constantly updated understanding of the operational environment through the use of joint intelligence preparation of the operational environment (JIPOE). JIPOE is designed to be used at the strategic and operational levels, while intelligence preparation of the battlespace is a process used by individual commanders within a joint task force to analyze their individual areas of responsibility at the tactical level.

(2) **Detect.** Engineers and planners use intelligence, surveillance, and reconnaissance assets to identify the location of natural and man-made obstacles, prepare to create/emplace obstacles, and identify potential means for obstacle creation. Their evaluation of existing obstacles or areas suitable for obstacle emplacement allows them to develop solutions and alternative courses of action (COAs), which may minimize or eliminate the adverse impact on joint force movement and maneuver.

(3) **Prevent.** Engineers and other planners apply this fundamental by limiting the enemy's ability to influence mobility through proactive measures before the obstacles are emplaced or activated. This may include destruction of enemy assets and capabilities before they can be used to create obstacles.

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

(5) **Neutralize.** Engineers and other staff elements plan to neutralize, reduce, or overcome obstacles and impediments to increase freedom of movement. 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. Protection may include countermobility missions to deny the enemy maneuver and to provide protection to friendly maneuvering forces.

(7) **Respond.** The overarching objective of response actions is to save lives and maintain mission capability. Response must be scalable, flexible, and adaptable to operational capabilities, including a well-developed public information and information operations component. Effective response hinges upon well-trained leaders and personnel who have invested in response preparedness and training. Response will depend on the amount and kind of damage caused by the incident and resources that can be applied.

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 archaeological sites, industrial/commercial infrastructure, major roads and electrical grid components, towns, canals, and railroad embankments.

2. **Constructed obstacles** are created without the use of explosives. Examples include wire obstacles, earth-filled bastions, prefabricated concrete sections, anti-vehicle ditches, and vehicle-stopping devices.

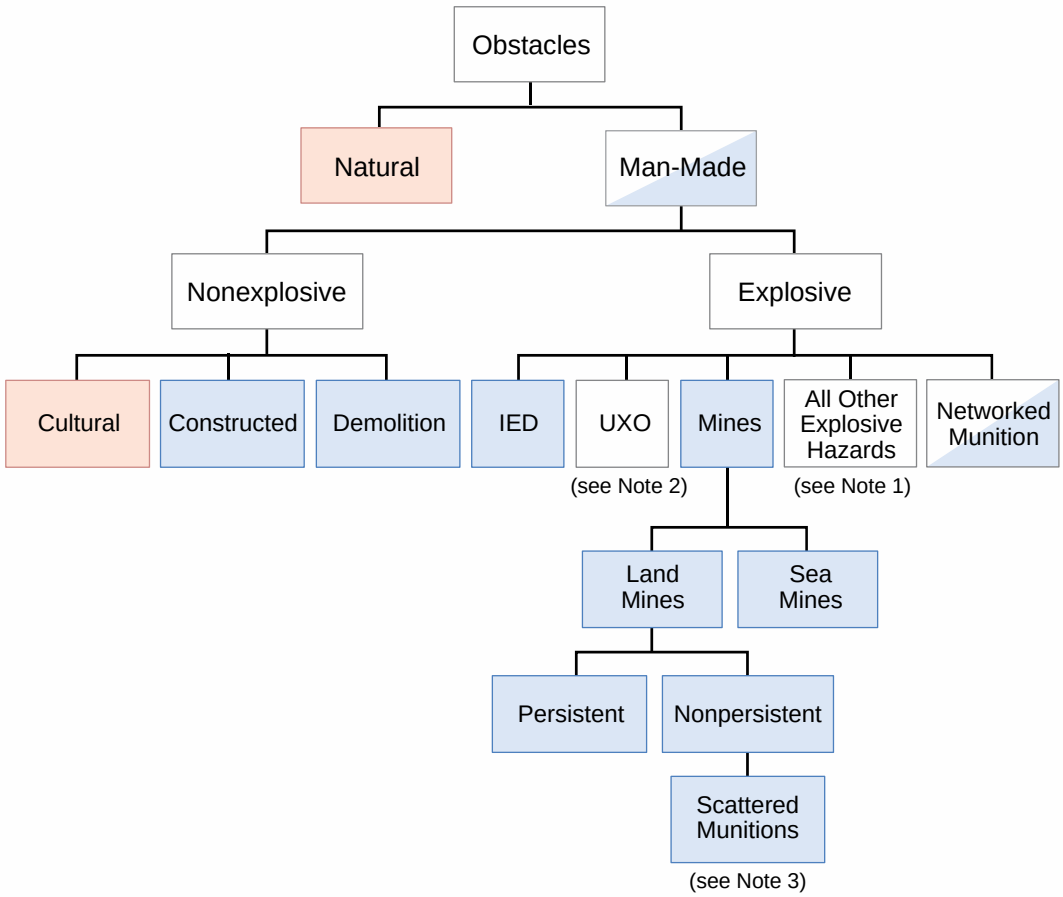
3. **Demolition obstacles** are created by the detonation of explosives. Examples include bridge demolition, road craters, and abatis.

(b) **Explosive Obstacles**

1. Mines

a. Land Mines. A munition placed under, on, or near the ground or other surface area and designed to be exploded by the presence, proximity, or contact of a person or vehicle. Land mines can be hand emplaced or scatterable via air, artillery, or ground delivery system.

## Types of Obstacles




NOTES:
1. Explosive hazards are defined in the glossary and a description of all explosive hazards is beyond the scope of this publication.
2. A description of all UXO types is beyond the scope of this publication.
3. Scattered munitions that have self-arming, self-destructing, and self-deactivating features are examples of nonpersistent land mines.

Legend

IED improvised explosive device
UXO unexploded explosive ordnance

existing obstacles

reinforcing obstacles

**Figure I-1. Types of Obstacles**

(1) Persistent. Mines that remain active indefinitely waiting for activation by the presence, proximity, or contact of a person or vehicle.

(2) Nonpersistent. Mines that remain active for a predetermined period of time until one of the following functions renders the mine inactive. For US munitions, all scatterable mines are nonpersistent with variable activation times.

(a) Self-destruction. An incorporated or externally attached, automatically functioning mechanism that secures the destruction of the munition into which it is incorporated or to which it is attached.

(b) Self-neutralization. An incorporated, automatically functioning mechanism that renders inoperable the munition into which it is incorporated.

(c) Self-deactivation Automatically rendering a mine inoperable by means of the irreversible exhaustion of a component (e.g., a battery) that is essential to the operation.

b. Sea Mines. 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.

2. IED. A weapon that is fabricated or emplaced in an unconventional manner incorporating destructive, lethal, noxious, pyrotechnic, or incendiary chemicals designed to kill, destroy, incapacitate, harass, deny mobility, or distract.

*For additional information about IEDs, see JP 3-15.1,* Counter-Improvised Explosive Device Operations.

3. UXO. Explosive ordnance that has been primed, fuzed, 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.

4. Networked Munitions. A class of remotely controlled, interconnected weapons systems that can be rapidly emplaced, consisting of nonpersistent anti-vehicle land mine (AVL)/antipersonnel land mine (APL) munitions that provide ground-based countermobility and protection capabilities through persistent surveillance and the scalable application of lethal and nonlethal means.

(3) **Existing Obstacles.** Natural and cultural obstacles present as inherent aspects of the terrain comprise this category.

(4) **Reinforcing Obstacles.** Obstacles that are specifically created to impede joint force movement and maneuver**.**

## 3. The Threat

Joint forces typically encounter obstacles in two physical domains: land and maritime. However, obstacle warfare can impact, and be impacted by, operations in other portions of the operational area.

a. **Land.** Joint forces may encounter obstacles across the operational environment. Obstacles are more effective, however, when they are integrated with highly restrictive terrain such as mountains, jungles, or urban areas to deny or canalize movement. 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 forces. Joint forces may encounter both modern and technologically obsolete mines. The relatively low cost of mines and IEDs and their worldwide availability makes them ideal weapons 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 explosive hazards (EHs) may necessitate defensive measures to reduce the vulnerability of US personnel, equipment, and facilities.

b. **Maritime.** Enemy mine emplacement 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 areas (AOAs), fire support, and carrier strike group operating areas. The application of technology by industrially advanced countries has produced a sophisticated, effective form of naval MIW. Nevertheless, older mine technologies remain effective. The ease of emplacing 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 emplacing only a few mines. Vessels in port are vulnerable to mines attached to their hulls or other forms of underwater attack by swimmers/divers. Another means of attack while in port or during transits of SLOCs or narrows is using suicide and non-suicide waterborne improvised explosive devices (WBIEDs). The use of such devices has been demonstrated by al Qaeda in attacks on USS COLE and the Motor Vessel LIMBURG.

c. **Air.** Enemy use of obstacles could pose a major threat to the ability to conduct effective air operations. Control of airspace is essential to effective surface operations. The enemy could emplace nonexplosive obstacles to hamper or impede friendly air maneuver. Cables, balloons, high-power transmission line towers (painted to make them difficult to see by friendly air crews) are a few examples. Further examples include 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 logistics sustainment operations to the air base, and thereby limit friendly air operations.

## 4. Legal Considerations

The use of some obstacles, specifically mines, is governed by international laws, treaties, and agreements, as well as by US law and policy. The US regards mines as lawful weapons when they are employed in accordance with US law and policy. US policy also governs some demining operations. In conducting mining operations, joint forces use the Chairman of the Joint Chiefs of Staff (CJCS) standing rules of engagement (ROE) in the

development of the ROE to ensure their actions are consistent with such laws and policies. These laws and policies are complex and occasionally change, so it is critical that joint forces carefully consider them when developing their local ROE and ensure 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 counteremployment 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 war** is that part of international law that regulates the conduct of armed hostilities. It includes four principles: **military necessity, 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, the conduct of belligerents and neutral powers toward each other and other nations, and limitation of use of certain types of weapons in warfare. The 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 naval MIW.

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

(b) The navigation and overflight provisions of the 1982 United Nations Convention on the Law of the Sea (UNCLOS) reflect customary international law and codify the rights and duties of nations with respect to the use of the ocean. Though the US has not ratified UNCLOS, US policy is to consider all navigation and overflight provisions of UNCLOS as reflective of customary international law and, thus, binding on US forces. Mine emplacement operations must consider the applicable international law and the rights and freedoms enjoyed by all nations.

(4) **The United Nations (UN) Charter** requires 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.

(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 1980 United Nations **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

## The Hague Convention (VIII) Provisions

Some of the provision are:

**Article 1**

It is forbidden—

1. To lay unanchored automatic contact mines, except when they are so constructed as to become harmless one hour at most after the person who laid them ceases to control them;
2. To lay anchored automatic contact mines which do not become harmless as soon as they have broken loose from their moorings;

**Article 2**

It is forbidden to lay automatic contact mines off the coast and ports of the enemy, with the sole object of intercepting commercial shipping.

**Article 3**

When anchored automatic contact mines are employed, every possible precaution must be taken for the security of peaceful shipping. The belligerents undertake to do their utmost to render these mines harmless within a limited time, and, should they cease to be under surveillance, to notify the danger zones as soon as military exigencies permit, by a notice addressed to ship owners, which must also be communicated to the governments through the diplomatic channel.

**Article 5**

At the close of the war, the contracting powers undertake to do their utmost to remove the mines which they have laid, each power removing its own mines. As regards anchored automatic contact mines laid by one of the belligerents off the coast of the other, their position must be notified to the other party by the power which laid them, and each power must proceed with the least possible delay to remove the mines in its own waters.

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

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 and record non-remotely delivered mines when feasible and publicize minefield locations at the conclusion of hostilities; after cessation of active hostilities clear, remove, destroy, or maintain minefields, 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. The protocol applies to internal conflicts as well as conflicts between states.

(6) **The Convention on the Prohibition of the Use, Stockpiling, Production, and Transfer of Anti-Personnel Mines and on their Destruction (Ottawa Convention) of 1997,** to which the US is not a party, bans the use, production, transfer, and stockpiling of APLs (to include self-destruct/self-deactivating nonpersistent systems) and came into force on 1 March 1999. The treaty does not restrict the use of antitank mines or AVLs, to

include those fitted with antihandling devices (AHDs). (Throughout this publication the term AVL is used to represent any antitank or anti-vehicle mine.) Nations that signed and implemented the Ottawa Convention, including many US allies, have legal restrictions that necessitate careful planning with other non-signatory partner nations (PNs) when contemplating any activities related to APLs. The US is not an official party to the Ottawa Convention, but on 23 September 2014 announced it was aligning its APL policy outside the Korean Peninsula with the key requirements of the Ottawa Convention. The policy was formalized by the President on 27 January 2016 in Presidential Policy Directive (PPD)-37, *US Landmine Policy*. The US's commitment and treaty obligations to the Republic of Korea preclude it from changing its APL policy there.

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 APLs be equipped with self-destruct devices and backup self-deactivation features (informally called "smart" mines).

3. Requires that all non-remotely delivered APLs not equipped with such devices (sometimes called "dumb" mines) be used within controlled, marked, and monitored minefields. US land mine policy prohibits the use of persistent land mines with the exception of their use for training personnel engaged in demining or countermining operations.

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

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

6. Provides for means to enforce compliance.

7. Clarifies the use of non-self-destructing/self-deactivating weapons that propel fragments in a horizontal arc of less than 90 degrees and that are placed on or above the ground (e.g., the M18 Claymore "mine" when used in the tripwire mode. Claymores used in command-detonated mode are not subject to Amended Protocol II restrictions) for a maximum period of 72 hours, if:

a. They are located in immediate proximity of the military unit that emplaced them, and

b. The area is monitored by military personnel to ensure the effective exclusion of civilians.

8. Upon ratification of the amended Protocol II, the US filed an understanding stating that the provisions of the amended Protocol II do not restrict or affect, in any way, nonlethal weapon technology that is designed to temporarily disable, stun, signal the presence of a person, or operate in any other fashion, but not to cause permanent incapacity.

(b) Additionally, PPD-37, *US Landmine Policy,* contains specific guidelines for use of APLs only on the Korean Peninsula and prohibits their use outside the Korean Peninsula.

(c) The US land mine policy addresses humanitarian land mine concerns while balancing legitimate warfigther requirements. Under this policy:

1. Continued use of self-destructing/self-deactivating APLs and AVLs on the Korean peninsula and AVLs only outside of Korea is supported. Self-destructing land mines are not the cause of humanitarian land mine concerns.

2. The US ended the use of persistent land mines of all types at the end of 2010, with the exception of use for training personnel engaged in demining or countermining operations and research purposes.

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

(d) CCW Protocol V (Explosive Remnants of War). On 28 November 2003, CCW states parties adopted Protocol V concerning explosive remnants of war (ERW). It was ratified by the US on 21 January 2009. Protocol V contains no restrictions or prohibitions on weapons or munitions. It addresses what must be done by parties to a conflict with respect to ERW that place civilians at risk and post-conflict remediation. Its focus is on pre-conflict preventive measures and post-conflict corrective measures. Its Technical Annex suggests best practices that parties are encouraged to follow on a voluntary basis to achieve greater munitions reliability. Obligations concerning clearance, removal, destruction, recording, precautions, and cooperation and assistance related to ERW apply only to ERW created after entry into force of Protocol V for the state party on whose territory the ERW are located; that is, the obligations are not retroactive.

*For additional information on the employment of mines by US forces or TTP for UXO/ERW, refer to Army Tactics, Techniques, and Procedures (ATTP) 4-32.2/Marine Corps Reference Publication (MCRP) 3-17.2B/Navy Tactics, Techniques, and Procedures (NTTP) 3-02.4.1/Air Force Tactics, Techniques, and Procedures (AFTTP) 3-2.12,* Multi-Service Tactics, Techniques, and Procedures for Unexploded Ordnance; *Marine Corps Warfighting Publication (MCWP) 3-31.2/Navy Warfare Publication (NWP) 3-15,* Naval Mine Warfare; *MCWP 5-12.1/NWP 1-14M/Commandant of the Coast Guard Publication P5800.7A,* The Commander's Handbook on the Law of Naval Operations *(section 7.7 and 9.2); Field Manual (FM) 4-30.51/MCRP 3-17.2A,* Unexploded Ordnance (UXO) Procedures; *and Army Techniques Publication 4-32.16/MCRP 3-17.2C/NTTP 3-*

*02.5/AFTTP 3-2.32*, Multi-Service Tactics, Techniques, and Procedures for Explosive Ordnance Disposal.

(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 when necessary for the purpose of supporting a concurrent US military operation. See Appendix C, "Humanitarian Mine Action;" JP 3-34, *Joint Engineer Operations;* and JP 3-29, *Foreign Humanitarian Assistance*, for additional information.

# 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. Marshall**
**US Army (1900-1977)**

### 1. Authorities and Responsibilities

a. **The President of the US and the Secretary of Defense (SecDef)**

(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. US joint forces will only employ nonpersistent mines that are authorized for employment in their operational area in accordance with US law and policy.

(2) **The President and SecDef**

(a) Approve ROE established by the geographic combatant commander (GCC) for the theater.

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

b. **The Secretary of State and ambassadors** obtain permission from HNs to employ mines within their territories or waters.

c. **CJCS** transmits policy and guidance concerning the employment of mines and HMAs from the President and SecDef to the combatant commanders (CCDRs).

d. **Joint Force Commanders (JFCs)**

(1) **CCDRs**

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

(b) Distribute ROE to subordinate commands for compliance.

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

(d) For operations outside the Korean Peninsula, provide guidance and direction on C2 with respect to APL employment by PNs who are not party to the Ottawa Convention so as to not violate US policy contained in PPD-37, *US Landmine Policy*.

(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.

(c) For operations outside the Korean Peninsula, provide guidance and direction on C2 with respect to APL employment by PNs who are not party to the Ottawa Convention so as to not violate US policy contained in PPD-37, *US Landmine Policy*.

## 2. General Considerations

### a. Barrier, Obstacle, and Minefield Levels of Employment

(1) **Strategic Employment.** Before hostilities, barriers, obstacles, and minefields can be used as flexible deterrent options without posing an offensive threat. Defensive employment along a hostile land border can demonstrate friendly resolve. Naval defensive and protective mining can help protect friendly ports and waters. Pre-hostility employment will be as directed by the President. Presidential determination will be based, in part, on diplomatic conditions and on concurrence by affected friendly nations. Should deterrence fail, offensive naval mining of enemy ports and waters can constrict enemy seaborne sustainment efforts and reduce enemy ability to safely deploy maritime forces. Similarly, offensive employment of scatterable 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, LOCs, and key facilities and free combat forces for offensive employment and denial operations. Barriers and obstacles of operational significance usually differ in scale from those of tactical significance. However, size alone does not make an obstacle operationally significant. At the operational level, the primary use of obstacles is to restrict enemy maneuver options or to create friendly maneuver options. Offensive employment can protect friendly maneuver while disrupting the enemy's ability to concentrate or maneuver forces. 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 logistics sustainment operations being performed in the enemy's rear area.

(3) **Tactical Employment.** The employment of barriers, obstacles, and minefields at the tactical level is normally done to achieve 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 maximize the effectiveness from an operational barrier, obstacle, or minefield, certain factors must be considered.

(1) On land, barriers, obstacles, and minefields are usually formed around or tied into an existing terrain feature (e.g., mountain chain or strait) or formed around a man-made structure (e.g., air base, canal, highway, or bridge). At sea, the placement of minefields is usually determined by environmental considerations such as depth, bottom characteristics, and littoral geography. Although there is little flexibility in positioning these large-scale obstructions, flexibility exists in selecting and designating 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. Intended effects of obstacles include disrupting, fixing, turning, or blocking enemy forces. 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 facilitating engagement, thus increasing lethality of supporting arms.

(3) The element of surprise can also be achieved through the employment of 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 the 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 achieve surprise through the use of air- or artillery-delivery systems that permit rapid mining 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 methods and utilize military deception (MILDEC) measures. When the type, location, and design are varied, the enemy's understanding and breaching of friendly barriers, obstacles, and minefields is made more difficult.

(4) Tactical barriers, obstacles, and minefields can be used offensively and defensively to help secure the population and provide protection for forward operating bases.

(5) Barriers may be used in humanitarian assistance/disaster relief and defense support of civil authorities operations for populace and resources control. Civil affairs (CA) personnel should be consulted regarding the potential impact on local attitudes.

(6) 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.

(7) Reinforcing obstacles and minefields are identified as early as possible, because the development of a barrier, obstacle, or minefield system in depth requires time, the commitment of engineer or specialized resources, extensive logistics support, or other forces such as overwatching maneuver elements.

(8) 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.

(9) In operations involving land forces, the creation of massive obstacles should be considered in situations where friendly forces control a major river dam or bridge. 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, such actions should only be considered after carefully considering the treatment of any such actions under the law of war and the ROE for the operational area. Any commander considering destruction of dams, bridges, or other civilian infrastructure must carefully conduct a proportionality analysis with the staff judge advocate to ensure that the likely impact to civilian personnel and property is not excessive in relation to military advantage expected to be gained. Commanders should also coordinate with the public affairs office to enable a coordinated response to any public or media interest in such destruction.

c. **Offensive.** The purpose of offensive barrier, obstacle, and minefield employment (to include air-delivered scatterable mines) is to impede or prohibit enemy movements while enhancing or protecting friendly force's maneuverability through or around. This is achieved by influencing or controlling the movement of enemy ground and naval forces and degrading the enemy's ability to conduct land-based aviation operations. 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).

(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 permit fewer forces to defend selected sectors, thereby allowing relieved maneuver units and other combat resources to be concentrated in other zones for attack. Similarly, they become a

## Barrier, Obstacle, and Minefield Objectives

**Offensive**

Enhances and protects the friendly force's ability to maneuver.

- Prevent enemy reinforcement or counterattack.
- Facilitate economy of force.
- Provide security.
- Degrade enemy air capability.
- Fix the enemy.

**Defensive**

Degrades the enemy's ability to maneuver or protect the force.

- Destroy or attrit the enemy force.
- Support economy of force measures.
- Retain key terrain or areas of significant strategic, operational, or tactical value.
- Enhance force protection.

**Figure II-1. Barrier, Obstacle, and Minefield Objectives**

combat multiplier, amplifying the firepower effectiveness of the friendly forces defending them by creating optimum fields of fire. Easily defended choke points 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 in the enemy generating sorties 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.** The purpose of defensive barrier, obstacle, and minefield emplacement is to degrade the enemy's ability to maneuver, defeat the enemy attack, regain initiative, gain time, concentrate forces, control terrain, and exhaust the enemy prior to assuming the

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

offensive. Naval MIW distinguishes between defensive minefields, which are minefields laid in international waters or international straits with the declared intention of controlling shipping in defense of sea communications, and protective minefields, which are minefields laid in friendly territorial waters to protect ports, harbors, anchorages, coasts, and coastal routes. Barriers, obstacles, and mines have four main objectives in defensive operations (see Figure II-1).

(1) **Destroy or Attrit the Enemy Force.** Barriers, obstacles, and mines can enhance the effectiveness of friendly fires or delay the enemy's advance, upset timing, disrupt, channelize formations, and delay or destroy follow-on forces.

(2) **Support of Economy of Force Measures.** Barriers, obstacles, and mines can be used in the economy of force role to strengthen a naturally strong existing obstacle area so that it need only be lightly defended, thus freeing forces to be concentrated elsewhere. Similarly, obstacles can be used in conjunction with mobile forces to protect flanks and other lightly defended areas.

(3) **Retention or Denial of Key Terrain.** Barriers, obstacles, and mines can be used to deny the enemy access to key terrain or areas of significant strategic, operational, or tactical value.

(4) **Force Protection.** Create barriers and obstacles for force protection.

e. **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 GCC establishes the theater policies governing denial operations in coordination with allied or friendly governments. The GCC subsequently delegates detailed planning and execution to subordinate commanders. In developing denial policies, these subordinate commanders must consider those facilities and areas required to support life in the post-hostility period regardless of the outcome of the conflict. Additionally, the subordinate commanders must weigh the long-range social, economic, political, and psychological effects of the incidental destruction of civilian properties against the military advantages gained. The law of war requires that all military operations, including denial operations, be conducted consistent with the principles of proportionality and discrimination.

(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 civilian facilities and structures that have been rendered military objectives because their nature, location, purpose, or use makes an effective contribution to military action and whose total or partial destruction, capture, or neutralization, in the circumstances ruling at the time, offers a definite military advantage. Examples include electrical power generation facilities and ports that are used by both the civilian population and the enemy's military force. A proportionality analysis is required when considering denial operations against such targets.

f. **MILDEC.** MILDEC consists of actions executed to deliberately mislead adversary military, paramilitary, or violent extremist organization decision makers, thereby causing the adversary to take specific actions (or inactions) that will contribute to the accomplishment of the friendly mission. Specific guidance from the JFC or higher authority during planning will determine the MILDEC role in a joint operation. Barriers, obstacles, and minefields can support MILDEC. Time and enemy surveillance techniques will determine the best method of employing barriers, obstacles, and minefields in support of MILDEC. 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 is a MILDEC technique.

*See JP 3-13.4,* Military Deception, *for more information.*

g. **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

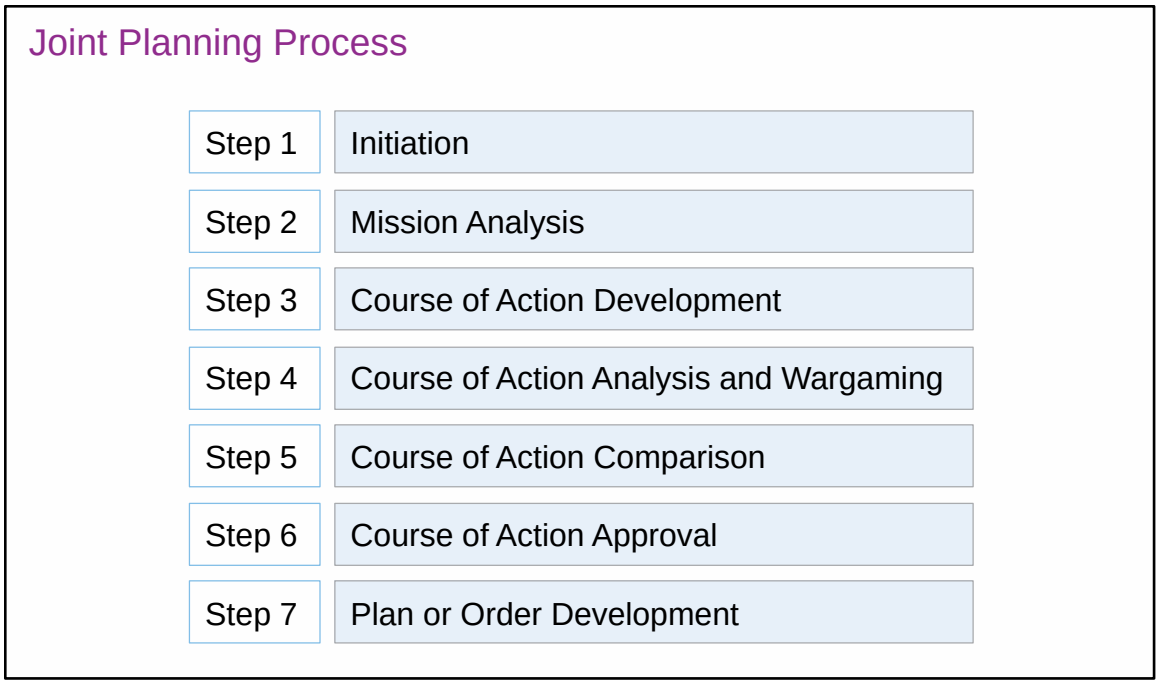



**Figure II-2. Joint Planning Process**

suspicion that mines have been emplaced can adversely affect enemy planning and operations in excess of the actual threat. The psychological impact of mines can be increased by exposure of their existence and the adversary's lack of a ready capability to implement countermeasures. These considerations should be included in the development of the information operations portion of the plan. Any information-related capabilities employed in the operational area should also highlight elements to prevent humanitarian impacts and offer a potential alternative method to influence the psychology of hostile and neutral elements.

### 3. Planning Sequence

The joint planning process (JPP) underpins planning at all levels and missions. 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 JPP are shown in Figure II-2 and are discussed in the remainder of this section.

a. **Planning Initiation.** JPP 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. CCDRs 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; logistics priorities; ROE; and the employment of obstacles and minefields to support denial operations. For operations outside the Korean Peninsula, planning must include identifying PNs who are not party to the Ottawa Convention and create command and control safeguards so as to not violate US policy contained in PPD-37, *US Landmine Policy*.

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. For operations outside the Korean Peninsula, COA determination must consider any PNs who are not party to the Ottawa Convention and their potential to use APLs. 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 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 operation plan (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 effects 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 integrates 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 logistics 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. For operations outside Korea, guidance must be given to include potential APL obstacle handovers from PNs that are not party to the Ottawa Convention.

(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 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. For operations outside the Korean Peninsula, the OPLAN must include guidance to US subordinate commanders on PNs that are not party to the Ottawa Convention.

g. The barrier, obstacle, and MIW 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 appendices (e.g., ROE and unit standard operating procedure).

h. Although employment is addressed separately in this publication, planning and employment is 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 reapportioning and reallocating assets and reprioritizing support for barrier, obstacle, and minefield emplacement.

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

*For more information, see JP 5-0,* Joint Planning.

## 4. Planning Support

a. **Intelligence.** Planning for operations involving barrier, obstacle, and MIW requires timely, continuous, and reliable all-source intelligence support. To support the planning process, commanders and staffs often require a variety of intelligence and engineer products that are available from a number of different intelligence and other organizations. This includes the command's geospatial intelligence cell. The combination of the focused intelligence analysis from the joint force intelligence organizations and support through reachback combine to meet the commander's intelligence requirements. Figure II-3 identifies some typical intelligence support tasks.

(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, descriptions, capabilities, and vulnerabilities).

(2) JIPOE is an analytical process used to produce intelligence assessments, estimates, and other intelligence products in support of the commander's decision-making process. Included in this analysis are the tasks of identifying 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 and TTP for countering and employing it; 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 JP 2-01.3,* Joint Intelligence Preparation of the Operational Environment, *for more information.*

(3) The joint force staff identifies significant information gaps about the adversary along with relevant aspects of the operational environment. With this information, intelligence requirements are developed for the collection of information or

## Intelligence Support Tasks

Tasks identify and evaluate:

- 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.
- Technical exploitation of recovered improvised explosive devices and weapons caches.

**Figure II-3. Intelligence Support Tasks**

the production of intelligence. Intelligence, surveillance, and reconnaissance collection operations must locate enemy barrier, mine, and obstacle locations; identify and locate enemy fire support and remaining enemy employment capabilities; and locate enemy breaching assets. This information, particularly updates, must be pushed down to tactical echelons. Given known enemy doctrine and TTP, intelligence must advise the JFC as to how the enemy will react in the face of friendly operations.

(4) **Obstacle Intelligence.** Obstacle intelligence describes the product resulting from the collection, processing, integration, evaluation, analysis, and interpretation of available information concerning any natural or man-made obstruction designed or employed to disrupt, fix, turn, or block the movement of friendly forces, and to impose additional losses in personnel, time, and equipment on friendly forces. The collection of information on obstacles and subsequent creation of obstacle intelligence are critical to breach planning and determining the necessary reduction techniques that offer the best chance for success while minimizing the risk to the breach force. This information is especially important when conducting breaching operations in complex or restrictive terrain to ensure that reduction assets are arranged in the right order in the movement formation, since the ability to reposition reduction assets within the formation may be limited due to the constricting nature of the terrain. Obstacle intelligence also validates the templated obstacles, helps verify an enemy intent and defense strength, and leads to refined maneuver and breach planning. Engineers, intelligence, and operations staff work together to determine specific obstacle information requirements for collection and subsequent

production of obstacle intelligence. Examples of obstacle-related information requirements include the following:

(a) Location, composition, orientation, frontage, and depth of obstacles.

(b) Types of mines, fuzes, and method of employment (such as anti-vehicle or antipersonnel [AP] mines, buried or surface-laid, AHDs, and depth of buried mines).

(c) Lane and bypass information.

(d) Interval between successive obstacle belts.

*For more information on intelligence support to joint operations, see JP 2-0,* Joint Intelligence. *See FM 3-34.170/MCWP 3-17.4,* Engineer Reconnaissance, *for more information on obstacle reconnaissance.*

b. **Logistics.** Planning for the use of barriers, obstacles, and mines involves the acquisition, storage, maintenance, distribution, and security of the materiel. Logistics 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. For operations outside the Korean Peninsula, planners need to address what to do with PNs who are not party to the Ottawa Convention and their APL stockpiles, especially if there is a consolidated storage area. 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 logistics function is crucial to the success of the OPLAN. It helps transform the OPLAN into tactical operations. Logistics 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.** The international movement and storage of mines must be carefully coordinated to avoid legal and political repercussions because the use, possession, transfer, and stockpiling of mines is closely regulated under various international agreements and countries have differing legal obligations related to the possession, use, storage, and transport of mines. For operations outside the Korean Peninsula, planners must address the implication of working with PNs who are not party to the Ottawa Convention and their APL stockpiles.

c. **Communications.** Planning for and employing barriers, obstacles, and mines requires communication to facilitate joint and multinational coordination and information flow to inform friendly forces (and, when necessary, other United States Government [USG] departments and agencies, international organizations, and nongovernmental

organizations, as well as civilians) of locations. These activities require that secure, interoperable communications systems are available to support the mission.

d. **EHs Database.** The joint force should establish a single EHs database for the entire operational area to facilitate a common understanding within the joint force and with multinational forces, other USG departments and agencies, international organizations, and nongovernmental organizations. This database should include all known and suspected mines, IEDs, UXO, and other EHs, and be compatible with common operational picture (COP) tools to enhance situational awareness and support situational understanding. The rapid and timely declassification of military data on locations of mines and other EHs is essential for information sharing and development of a COP, which allows friendly forces the ability to safely navigate around or through these known obstacles.

*For more information, see JP 5-0,* Joint Planning.

# CHAPTER III
## LAND OPERATIONS

*"Gentlemen, I don't know whether we will make history tomorrow, but we will certainly change geography."*

**General 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 impact military operations in a range of situations—from defense support of civil authorities in an area littered with hurricane debris, through stability operations in which insurgents employ EHs, to offensive or defensive operations employing complex man-made and natural obstacle systems. This chapter discusses the framework to plan and conduct land operations to minimize the impact **from barriers, obstacles, and land mines, and to synchronize their employment.**

a. **Support to Movement and Maneuver.** Support to movement and maneuver is the integrated application of assured mobility throughout the operational area to preserve combat power. It is the framework within which consideration of barriers, obstacles, and MIW 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 the capability to employ or counter obstacles. For operations outside the Korean Peninsula, JFCs need to address command and control arrangements with PNs who are not party to the Ottawa Convention so as to not violate US policy contained in PPD-37, *US Landmine Policy*. For example, it includes the regulation of traffic in the maneuver space, the handling of dislocated civilians, and other capabilities to support the maneuver plan. While support to movement and maneuver provides the broader framework of enabling capabilities, the discussion of barriers, obstacles, and MIW 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 scatterable mines/networked munitions 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. The remainder of this chapter discusses those combat engineering mobility, countermobility, and supporting survivability tasks that shape or deny land operations by employing or countering the employment of barriers, obstacles, and land mines. General engineering may also support mobility, countermobility, and survivability operations at all levels of warfare. Geospatial engineering is present to support all engineer operations.

*For further information about the engineer functions and the differences between combat and general engineers, see JP 3-34,* Joint Engineer Operations.

## 2. Mobility Considerations

a. **General.** Mobility operations include five functional areas, three of which are designed to directly meet challenges from barriers, obstacles, land mines, and other EHs. 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 ATTP 3-90.4/MCWP 3-17.8, *Combined Arms Mobility Operations*.

(1) **Conduct Combined Arms Breaching Operations.** Detect, 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. **Combined Arms Breaching Operations**

(1) Successful breaching operations are characterized by applying the **breaching tenets.** These tenets should be applied when obstacles are encountered in the operational area that require breaching operations. These tenets are:

(a) **Intelligence** (includes obstacle intelligence).

(b) **Breaching fundamentals** of suppress, obscure, secure, reduce, and assault.

(c) **Breaching organization** with clear C2 channels.

(d) **Mass** of breaching capabilities.

(e) **Synchronization** of breaching activities with operations.

(2) Combined arms breaching operations are complex, but they are not an end in themselves. They are a part of the maneuver forces' operation that helps achieve the objective. Breaching operations keep ground forces moving to the objective. When developing COAs for combined arms breaching operations, utilize the breaching considerations shown in Figure III-1.

(3) As the combined arms team plans future operations, it may develop COAs that require breaching operations. Enemy obstacles that disrupt, fix, turn, or block the maneuver force can impair 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 are focused on tactical engineer reconnaissance to include obstacle intelligence, and develop techniques to clear obstacles in the path of the force. Geospatial engineering may provide data to help plan a deliberate breach. At the brigade combat team (BCT) and the regimental combat team (RCT) level, organic combat engineer companies may require augmentation for more complex or sustained breaching operations. Appendix B, "Service Specific Considerations," provides information on those capabilities likely needed to augment joint forces conducting mobility operations.

(4) Breaching operations are adapted to exploit the situation. Deliberate, hasty, or covert breaching operations are used depending on 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 prior planning, preparation, and buildup of combat power on the near side of obstacles. Subordinate units are 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) **Hasty Breach.** A hasty breach is an adaptation of the deliberate breach, but is conducted when less time is available. It may be conducted in support of pre-planned or responsive operations. Hasty breaches may be necessary due to lack of clarity on enemy obstacles or changing enemy situations to include the emplacement of scatterable mines or networked munitions.

(c) **Covert Breach.** Covert breaching is the creation of lanes through minefields or other obstacles that is planned to be executed without detection by an

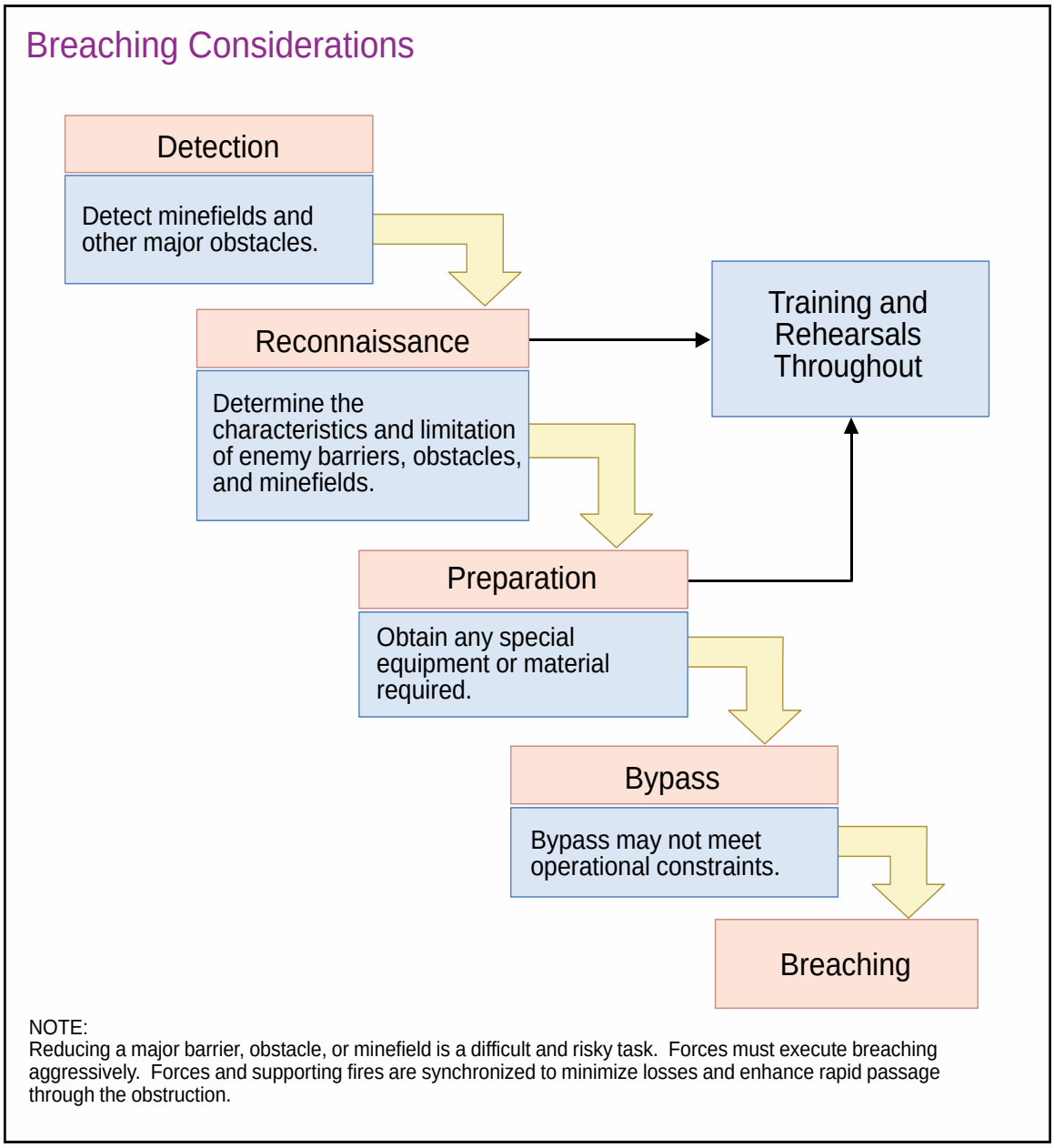



**Figure III-1. Breaching Considerations**

adversary. Its primary purpose is to reduce obstacles in an undetected fashion to facilitate the passage of maneuver forces. A covert breach is conducted when surprise is necessary or desirable. Covert breaching is characterized by using stealth when reducing the obstacles, with support and assault forces executing their mission only if reduction is detected. Covert breaches are best conducted during periods of reduced visibility. The covert breach can use elements of the deliberate and hasty breach.

(d) **Breaching Variants**

1. **Amphibious Breach.** An amphibious breach is an adaptation of the deliberate breach specifically designed to overcome anti-landing defenses to conduct an amphibious assault.

2. **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 is enabled by preplanned, well-trained, and well-rehearsed breaching battle drills and execution of the unit's standard operating procedures. The in-stride breach takes advantage of surprise and momentum to breach obstacles. In-stride breaches are effective against either weak defenders or very simple obstacles, when joint forces can execute battle drill on the move. Attacking forces are generally configured to execute an in-stride breach except when a deliberate breach is planned.

(5) Combined arms breaching operations require the constant consideration of METT-T factors 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.

(6) The most effective means to counter mines or other EHs is to prevent their employment. Proactive countermine operations destroy enemy mine or other EH manufacturing and storage facilities or emplacement capabilities before the mines or EHs are emplaced. Planners should 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, units should target enemy engineers and equipment.

c. **Clearing Operations.** Clearing operations are conducted to 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 available neutralization systems are only partially effective. 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. Obstacle tracking and reporting should be properly documented and archived for situational awareness. This information is distributed up through the chain of command and eventually consolidated at the JFC level. At each level of command, the information can be used to develop a COP for the unit.

*For additional information about defeating IEDs, see JP 3-15.1,* Counter-Improvised Explosive Device Operations.

*For a general discussion of clearing (route and area) operations, see ATTP 3-90.4/MCWP 3-17.8,* Combined Arms Mobility Operations. *For a discussion of clearing TTP, see FM 3-34.210/MCRP 3-17.2D,* Explosive Hazards Operations; *FM 3-34.214/MCRP 3-17.7L,* Explosives and Demolitions; *and FM 3-90.119,* Combined Arms Improvised Explosive Device Defeat Operations.

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, organic combat engineer companies will typically require augmentation by additional engineer capabilities for most gap crossing operations. Appendix B, "Service Specific Considerations," provides information on those capabilities that may be required to augment the BCT/RCT for 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 ATTP 3-90.4/MCWP 3-17.8,* Combined Arms Mobility 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 antilanding 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* ATTP *3-90.4/MCWP 3-17.8,* Combined Arms Mobility Operations; *NWP 3-15/MCWP 3-31.2,* Naval Mine Warfare; *MCRP 3-31.2A/NTTP 3-15.24,* Mine Countermeasures in Support of Amphibious Operations; *and JP 3-02,* Amphibious Operations, *for detailed discussions 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 civilians restricts current military technology.

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

## 3. Countermobility Considerations

a. **General.** The objective of barrier, obstacle, and MIW employment is to disrupt, fix, turn, or block enemy forces and protect friendly forces. Employment is not an end in

itself, but supports the maneuver plan. This section discusses the employment of barriers, obstacles, and scatterable mines/networked munitions 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 Army Techniques Publication 3-90.8/MCWP 3-17.5,* Combined Arms Countermobility Operations*, for a more detailed discussion of the tactical employment of barriers, obstacles, and land mines. Also see Appendix B, "Service Specific Considerations."*

b. **Terrain Considerations.** Engineers are essential in the engagement area development for countermobility operations.

(1) Engineers anticipate and provide terrain analysis products of likely contingency areas in support of JIPOE. Geospatial products assist in describing the environmental effects on enemy and friendly capabilities and broad COAs. Planners use modern, automated tools and equipment to create a very detailed analysis of the terrain and weather.

(2) Many data management, analysis, and visualization tools are available to assist in the geospatial planning effort. Geospatial engineering provides commanders with terrain analysis and visualization, which improve situational awareness and enhance decision making. Examples of geospatial information useful for planning purposes are as follows:

(a) Three-dimensional terrain fly-through capability.

(b) Avenues and routes for joint forces, as well as likely enemy avenues of approach.

(c) Obstacle zone locations.

(d) Potential engagement areas.

(e) Potential unit positions or sites.

(f) Airfield and port information and capabilities.

(g) Support to urban operations and other complex terrain.

(h) High-payoff target information.

(i) Deep-target information.

(j) Communications or visual line of sight.

(k) Locations of LOCs and main supply routes and potential locations of base camps.

(l) Identification of flood plains and potential LZs.

(m) Fuzed data from multiple databases.

(3) Terrain analysis is a key product of geospatial support. It is the study of the terrain's properties and how they change over time, with use, and under varying weather conditions. Terrain analysis starts with the collection, verification, processing, revision, and construction of source data. It requires the analysis of climatology (current and forecasted weather conditions), soil conditions, and enemy or friendly vehicle performance metrics. Terrain analysis and geospatial information and services are necessary to support mission planning and operational requirements. Geospatial information and services require the management of an enterprise geospatial database at every echelon from combatant command to deployed maneuver forces. Terrain analysis is a technical process and requires the expertise of geospatial information technicians and a geospatial engineer.

(4) Geospatial functional analysis sample products graphically describe the following:

(a) Industries and energy.

(b) Telecommunications infrastructure.

(c) Underground facilities and caves.

(d) Political boundaries.

c. **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 to restrict enemy breaching efforts, maneuver, and massing of forces and to increase the destruction of enemy forces. Planned on-call fires (indirect and/or direct) are ideal for this purpose.

d. **Countermobility Resources.** The employment of mines, networked munitions, 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 and the materials and equipment needed to perform the work to support the obstacle effort. The following four categories provide a useful framework for identifying the resources required for effective countermobility operations:

(1) **Mines. Land mines are categorized as either persistent or nonpersistent.** Both categories provide anti-vehicle and AP capabilities. **Persistent mines are no longer authorized for use by US forces (except as noted in Chapter 1, "Introduction," paragraph 4.b, "US Law and Policy").** Many persistent mines are activated by pressure or contact. These mines are emplaced by hand or mechanical means, buried or surface emplaced, and normally emplaced in a pattern that aids recording. Mechanical emplacement may be restricted by terrain conditions. The emplacement of persistent minefields is normally time, manpower, and logistics intensive.

(a) Scatterable mines are 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 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 four hours to 15 days. Scatterable mines significantly reduce manpower requirements associated with MIW. Smaller and lighter, these mines reduce logistics 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 deep-delivered capability is only available for employment on the Korean Peninsula. The current deep-delivered system (Gator) is a mixed system (APL/AVL) and is not available for employment outside the Korean Peninsula in accordance with PPD-37, *US Landmine Policy*. Aircraft and artillery are the most flexible and responsive means of scatterable mine delivery; however, they often have other competing roles. Other disadvantages include time and high number of artillery rounds or aircraft sorties required to emplace a minefield. These factors increase the exposure of emplacing artillery to counter battery fires and emplacing aircraft or helicopters to enemy air defenses. Networked munitions are a class of remotely controlled, interconnected weapons systems that can be rapidly emplaced, consisting of nonpersistent (self-destructing/self-deactivating) AVL/APL munitions that provide ground-based countermobility and protection capabilities through persistent surveillance and the scalable application of lethal and nonlethal means (see Figure III-2).

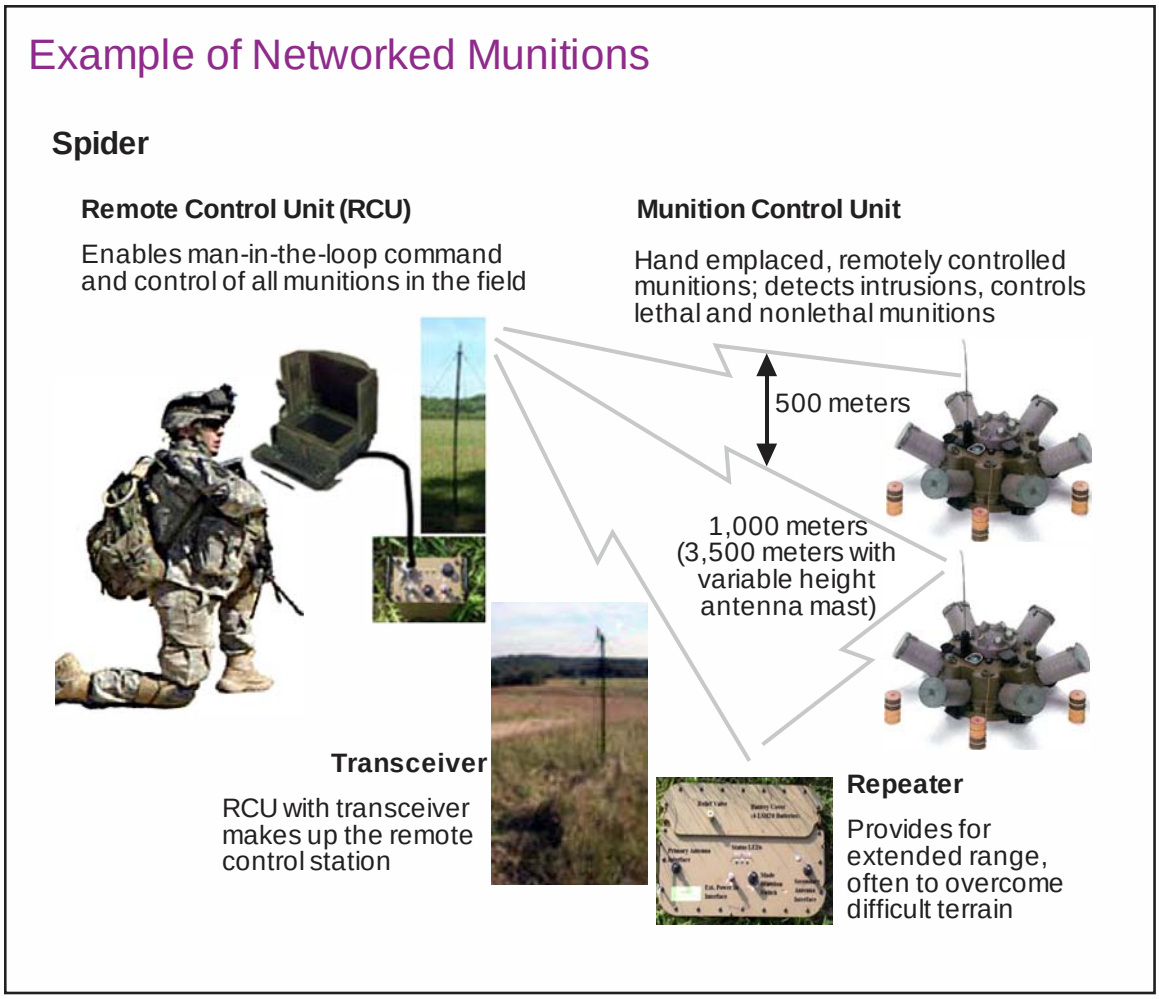



**Figure III-2. Example of Networked Munitions**

(b) 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, the joint force engineer, and the joint force air component commander, if established. The joint force air component commander plans the use and delivery of air-delivered scatterable mines. The joint force engineer plans and integrates minefields into the barrier plan. The joint targeting coordination board is a forum to facilitate joint forces targeting operations to support and synchronize JFC targeting objectives. 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 scatterable mines are deployed where friendly forces may be operating or in locations that lie within the operational area. Once emplaced, scatterable mines remain active until detonated or until the mines self-destruct or self-deactivate after a preset period of time. Required self-destruct or self-deactivate times depend upon the operational or tactical situation and are not necessarily related to the proximity of friendly forces. Although scatterable mines have self-destruct/self-deactivation features, scatterable mine fields should be expected to contain UXO despite passage of the pre-selected self-destruct/self-deactivate times. As a result, friendly forces

moving through scatterable mine fields should employ breaching or clearing tactics. US scatterable mines are designed to self-destruct and/or self-deactivate. 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 AOA.

3. In early stages of contingency operations or at extended ranges, air-deliverable scatterable mines may be the only available mining capability. For operations outside the Korean Peninsula, the only air-delivered scatterable mines available for employment are the helicopter-delivered AVL Volcano.

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.

(2) **Networked Munitions.** As with the employment of scatterable mines, networked munitions requires close coordination between components during both the planning and employment phases of the operation. The same control measures as scatterable mines must be implemented. An example of networked munitions is the Spider system. This system is interoperable with the Army Battle Command by utilizing data feed sets to populate a common operating picture. This system provides man-in-the-loop operations and on-off-on capability, permitting the passage of friendly forces on demand and reducing incidents of friendly fire incidents and unintended engagements on civilians.

(3) **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 choke points. 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.

(4) **Constructed obstacles are man-made,** created without the use of explosives. Typical tactical examples are barbed wire obstacles and anti-vehicle 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.

(5) **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 the improvised use of military demolitions 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. Employment of field expedient obstacles that possess the same characteristics as APLs (designed to be exploded by the presence, proximity, or contact of a person and that will incapacitate, injure or kill one or more persons) will on be employed in accordance with US law and policy.

e. **Offensive Employment.** During offensive planning, 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 disrupting 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) Obstacle tracking and information flow to inform friendly forces of friendly and enemy barrier, obstacle, and minefield locations using the standard report formats.

f. **Defensive Employment.** During defensive planning, the JFC, through the joint force staff, identifies priority locations and plans and coordinates the joint emplacement of barriers, obstacles, and minefields. The JFC must proactively define the methodology that subordinate commanders use to both track obstacle emplacement and to report the status of their defensive systems. Under some circumstances, the JFC may designate the systems that subordinate commanders use for emplacement. For operations outside the Korean Peninsula, this is especially important when subordinate commanders of PNs are not party to the Ottawa Convention and may employ APLs. The primary intent of defensive barrier, obstacle, and MIW employment is to degrade enemy capabilities by disrupting combat formations and 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 intends to engage 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.

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

(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) Integration of barrier, obstacle, and minefield emplacement complements the plan for defense.

(9) Emplacement of nonpersistent minefields and other time- or labor-intensive obstacles before the beginning of hostilities in order to reduce the exposure to enemy fire.

(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. For operations outside the Korean Peninsula, the only air-delivered scatterable mines available for employment are the helicopter-delivered AVL Volcano. However, organic systems should be employed whenever possible.

(11) The timetable for friendly operations may be upset or cause incidents of friendly fire if the wrong self-destruct settings are used. Emplacement of nonpersistent scatterable minefields is not nearly as labor-intensive as the old conventional munitions, but the planning has to be precise for their placement and the time duration set on the munitions for the self-destruct time of four hours, 48 hours, or 15 days.

(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.

g. **Other Considerations.** The overriding consideration in planning obstacles is accomplishment of the mission. However, there are three considerations that are key to the military mission.

(1) **Legal Restrictions.** The creation and employment of countermobility barriers, obstacles, and mines must comply with the law of war, international law, and US law and policy. The JFC will ensure that the staff judge advocate is integrated throughout the planning process and that countermobility plans—especially those involving the emplacement of mines—receive a final 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. Iraqi mines 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 will not only minimize friendly fire incidents but also expedite clearing operations when peace is restored.

*For a general discussion of clearing (route and area) operations, see ATTP 3-90.4/MCWP 3-17.8,* Combined Arms Mobility Operations. *For a discussion of clearing TTP, see FM 3-34.210/MCRP 3-17.2D,* Explosive Hazards Operations; *FM 3-34.214/MCRP 3-17.7L,* Explosives and Demolitions; *and FM 3-90.119,* Combined Arms Improvised Explosive Device Defeat Operations. *See also Appendix C, "Humanitarian Mine Action," for more discussion.*

(3) **Impacts of Obstacles on Civilians 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 adverse impacts on civilians and often will have long-term effects on them and the environment and are governed by the law of war. Commanders must minimize the impact of obstacles on civilians 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. Efforts should be undertaken to mark minefields to prevent harm to civilians. Commanders must 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 civilians, friendly forces, and the environment. Moreover, application of the principles of proportionality and military necessity are legal requirements under the law of war.

### 4. Command and Control

a. **Planning.** Commanders and staffs consider both friendly and enemy use of obstacles when planning operations. At the tactical level, assured mobility planning brings focus to mobility, countermobility, and survivability task planning in support of breaching, clearing, and gap crossing operations. At the tactical level, commanders focus on identifying the scheme of maneuver that must be supported by mobility and/or countermobility efforts. At the operational level, countermobility planning focuses on granting obstacle emplacement authority or providing obstacle control. 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. Obstacle tracking must be an integral part of initial and subsequent planning.

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 and staff to formulate, confirm, or modify the COA. The information gathered through reconnaissance, other geospatial products, and terrain analysis supports the mobility operation. Tactical reconnaissance supporting mobility operations should focus on obstacle information. This information collection effort includes all tasks 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 verify the condition of natural or other man-made obstacles.

c. **Control Means.** The purpose of obstacle control is to synchronize subordinate obstacle efforts with the commander's intent and scheme of maneuver. Commanders exercise obstacle control by granting or withholding obstacle emplacement authority or restricting obstacles through orders or other specific guidance. However, commanders must be cognizant that lack of obstacle control measures may result in obstacles that interfere with the higher commander's scheme of maneuver, while excessive obstacle control may result in a lack of obstacles that support the refined fire plans of subordinate commanders. 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.

*ATTP 3-90.4/MCWP 3-17.8*, Combined Arms Mobility Operations, *provides detailed discussions of marking operations.*

# 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, *The Art of War***

### 1. General Discussion

a. **General.** Naval MIW consists of the strategic, operational, and tactical employment of sea mines and mine countermeasures (MCM). MIW is divided into two categories: the emplacement of mines to degrade the enemy's capabilities to wage land, air, and maritime warfare, and the countering of enemy mining capability or emplaced mines in order to permit friendly maneuver. Naval MIW has played a significant role in every major armed conflict involving the US since the Revolutionary War. Mines can be inexpensive, easy to procure, reliable, effective, and difficult for intelligence agencies to track. More than 50 of the world's navies have mine emplacing capability, while a considerable number of countries, many of which are known mine exporters, actively engage in development and manufacture of new models. Although many of these stockpiled mines are relatively old, they remain lethal and can often be upgraded.

b. As adversaries have pursued irregular means, they have introduced the IED threat to the maritime domain. Boats laden with explosives or WBIEDs can be used against ships and areas connected to water. An early example of this type was the Japanese Shinyo suicide boats during World War II. These explosive-laden boats were successful in damaging or sinking several American ships. More recently, suicide bombers used a WBIED to attack the USS COLE in the port of Aden. In Iraq, US and United Kingdom troops have been killed by WBIEDs. The proliferation of WBIED knowledge continues to spread in extremist networks. A further use of minefields by adversaries is to accentuate the effectiveness of other weapons and thereby provide a suitable environment for their use rather than a primary weapon. This may be achieved by using minefields to channel shipping into selected killing areas or restrict their maneuverability.

c. Naval MIW employs a broad approach, incorporating offensive and defensive aspects of MIW. National and military objectives can sometimes be achieved without clearing or even breaching adversary minefields. If US forces can prevent mines from being employed, bypass adversary minefields, or restrict the enemy to deploying only tactically insignificant minefields, then US objectives are more easily achieved.

d. **Legal Considerations in the Employment of Mines.** The use of naval mines is governed by Hague Convention VIII of 1907, which limits the type, method of use, and tactics used by nations employing mines. Other international agreements, as well as US and allied peacetime ROE and ROE during armed conflict, constrain their use. All joint commanders involved in MIW, whether mining, MCM, or both, should be familiar with these legal considerations. A more detailed discussion of international law relative to naval mines is contained in NWP 3-15, *Naval Mine Warfare*.

## 2. Naval Mine Warfare Command and Control

a. **JFC.** Naval MIW is an enabler of joint force operations. The JFC is supported in MIW by the Navy component commander (NCC), or, if assigned, a combined or joint force maritime component commander (JFMCC).

b. **NCC or JFMCC.** The NCC or JFMCC staff supports the JFC with all operational-level military operations at sea, including MIW. As such, the NCC staff should integrate MIW into their planning. The Surface and Mine Warfighting Development Center (SMWDC) maintains a deployable staff to provide phased, scalable MIW expertise and support to NCCs.

c. **Mine Warfare Commander (MIWC).** The MIWC is a supporting warfare commander to the NCC or the officer in tactical command and is the commander's primary advisor on all aspects of MIW—both mining and MCM. SMWDC can serve as the MIWC and perform the MIW functions in support of the NCC.

d. **Mine Countermeasures Commander (MCMC).** The MCMC is the supporting commander to the MIWC or designated commander for MCM within an assigned area. Depending on the extent of operations and geography, it is conceivable to have multiple MCMCs under the coordination of a single MIWC. United States Navy (USN) mine countermeasures squadrons (MCMRONs) fulfill the MCMC role, and are the preferred choice for MCM planning and force C2. The MCMC controls the operations of MCM assets (surface mine countermeasures [SMCM] vessels, airborne mine countermeasures [AMCM] squadrons and detachments, and underwater mine countermeasures [UMCM] elements) in the operational area.

## 3. Environmental Considerations

a. Mine cases, mine sensors, target signals, and MCM systems are all impacted by environmental factors and impact the selection of equipment and procedures.

b. **Influence of the Environment.** Mines are effective in proportion to the suitability of the environment for both weapons delivery and deployment after mine placement. Environmental factors that should be considered when deciding to conduct exploratory and reconnaissance operations, as well as employment techniques, are provided in Figure IV-1.

## 4. Elements of Naval Mine Warfare

MIW can be divided into the subdisciplines of mining and MCM. These are further divided into various areas, depicted in Figure IV-2, and discussed in paragraph 5, "Mining," and paragraph 6, "Mine Countermeasures."

## 5. Mining

Mining supports establishing and maintaining control of essential sea areas. Mining includes all methods that use naval mines to deny sea area or inflict damage on adversary shipping to hinder, disrupt, and deny adversary operations.

| ENVIRONMENTAL CONSIDERATIONS IN NAVAL MINE WARFARE | | |
|---|---|---|
| **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, acoustically, 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, stability, and “clutter” | 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 minelike contacts, and sonar hunting efficiency |
| Magnetic environment | Electrical conductivity, number of magnetic minelike 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 Naval Mine Warfare**

a. **Mining Objectives.** In MIW, mining has application in all phases of joint operations. US mining can be employed to reduce the adversary’s threat to friendly forces and preserve freedom of action. Mining is essential to other warfare areas, particularly strike, antisubmarine, and antisurface warfare. Sea mines, or the threat of their presence, may restrict enemy use of sea areas vital to their operations. Conversely, mines may be used to protect friendly harbors, channels, and shores. Delays and interruptions in the shipping of war materiel may deprive the enemy of critical offensive and defensive

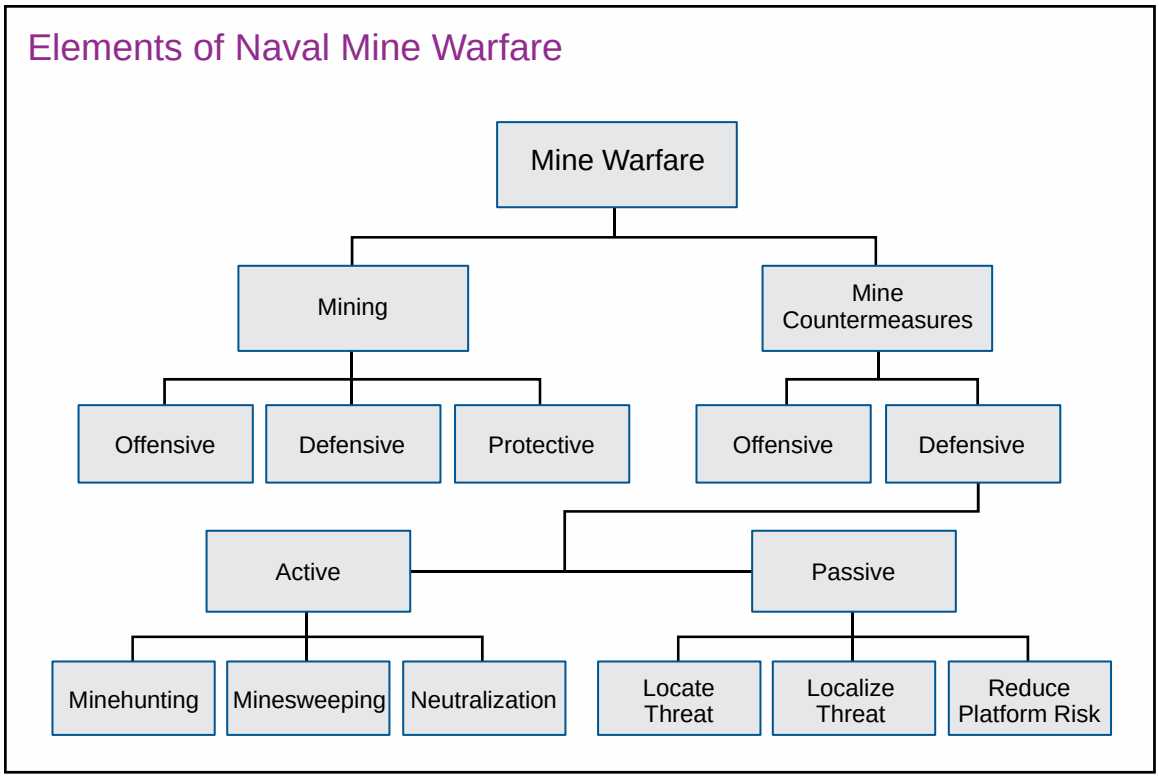



**Figure IV-2. Elements of Naval Mine Warfare**

capabilities. Enemy ships confined to their bases or deterred in transit by mining operations contribute less to the war effort, and delays in shipping may be as costly as actual losses.

b. **US Mining Policy.** In war, US policy is to conduct offensive, defensive, and protective mining as necessary. The decision to employ mines is typically made by the CCDR or higher authority, depending on ROE. Mines can reduce the enemy threat by destroying and disrupting their operations, interdicting enemy SLOCs and ports to neutralize or destroy combatant and merchant ships, and by defending US and allied shipping. More specifically, naval mines aid in sea control in conjunction with other forces to:

(1) Deter enemy use of naval mines.

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

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

(4) Protect ports; coastal lines of passage; open preplanned shipping lanes, referred to as Q-routes; and designated operating areas.

(5) Destroy enemy ships and submarines directly.

(6) Establish blockades to provide political leverage in a limited war situation.

(7) Deny the enemy the ability to carry out amphibious operations, or in support of friendly amphibious operations.

c. **Mining Assets.** Mining is generally conducted by United States Air Force (USAF) or USN strike aircraft. Submarines and surface ships can also be configured to emplace mines. Given the joint warfare aspects of mining, the NCC's MIW staff will work in coordination with the operations and intelligence directorates of a joint staff.

*For additional information on naval mining capabilities, refer to Appendix B, "Service Specific Considerations," and NTTP 3-15.1,* Maritime Mining.

## 6. Mine Countermeasures

MCM is the second area of MIW. MCM includes all actions to prevent enemy mines from altering friendly forces' maritime plans, operations, or maneuver. MCM reduces the threat of mines and the effects of enemy-emplaced sea mines on friendly naval force and seaborne logistics force access to and transit of selected waterways.

a. MCM operations are divided into offensive and defensive MCM (see Figure IV-3).

(1) **Offensive MCM.** The most effective means of countering a mine threat is to prevent the emplacement of mines in the first place. Offensive MCM deters or destroys enemy mining capability before the mines are emplaced. Although essential to offensive MCM, these operations are not normally conducted by naval MIW forces. Given the significant impact that enemy mines can have on the JFC's CONOPS, the JFC and MIW

### Maritime Mine Countermeasures

**Offensive**

Prevent the emplacement of mines through destroying enemy mine:

- Manufacturing facilities
- Storage facilities
- Emplacing platforms

**Defensive**

Counter mines once they have been emplaced through:

Passive mine countermeasures

- Localization of threat utilizing Q-routes
- Detection and avoidance of minefields
- Risk reduction

Active mine countermeasures

- Minehunting
- Minesweeping

**Figure IV-3. Maritime Mine Countermeasures**

planners should consider inclusion of enemy mine layer, mine storage, and, ultimately, mine production facilities and assets on joint target lists.

(2) **Defensive MCM.** Defensive countermeasures counter mines after they are emplaced. MCM can be conducted following the termination of conflict to eliminate or reduce the threat to shipping posed by residual sea mines. However, most defensive MCM operations are conducted in support of other maritime operations, such as sea control or power projection. Defensive MCM includes passive and active MCM.

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

1. Localization of the threat is aided by the establishment of a system of transit routes for friendly forces. These routes may be designated as Q-routes, to be used by friendly shipping to minimize exposure in potentially mined waters. Establishment of transit routes should be one of the first steps taken by MCM planners, if routes have not been designated previously.

2. Detection and avoidance of minefields is enabled by exploiting intelligence information and MCM efforts. When mine location has been established, shipping may be routed around the area.

3. Risk reduction consists primarily of ship self-protection measures rather than external MCM activity. Risk may be reduced by limiting interaction with a mine sensor. Against contact mines, a reduction in draft and posting additional lookouts can reduce the number of mines the ship's hull strikes. Reducing the ship's emissions also reduces activation signals for many influence mines. 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 risk reduction. Enhancement of ship survivability in the event of mine detonation is another form of risk reduction.

(b) Active MCM is employed when passive countermeasures alone cannot protect shipping traffic. This entails physical interference with the explosive function of the mine or actually destroying it. Minehunting and minesweeping are the primary techniques employed in active MCM. Both are enabled by detailed intelligence and planning by the MCMC. Due to the nature of the MCM mission and forces involved, local air and maritime superiority is normally required for successful MCM operations.

1. **Minehunting.** Minehunting is 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. When mines are located, mine neutralization is performed through the use of systems such as remote-controlled vehicles, explosive ordnance disposal (EOD) divers, or

marine mammal systems. 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 helicopters 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 they can be destroyed by EOD divers. Influence sweeping involves the use of towed or streamed devices that emit signals emulating target ships to trigger influence mines.

b. **Intelligence Support**

(1) **Intelligence Gathering.** Prior to MIW operations, intelligence may indicate the types, quantities, or locations of mine storage sites. This information can cue the surveillance of mine storage sites to detect the movement of mines. Intelligence of mine movement to mine emplacing platforms and the subsequent movement of the mine emplacing platforms can provide advance information to ascertain the type, size, and location of minefields. Where mining is a possible threat, tracking and intelligence collection should begin early and be sufficiently systematic to provide confident estimates of mine activity.

(2) **Mine Exploitation.** MCMs are enabled by detailed knowledge of the mine sensor and targeting circuitry. Intelligence on enemy mine emplacement operations can help identify the type of sensor and style of target processing used. Accurate data can be acquired by actually exploiting a mine recovered during MCM operations. 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 is used to develop an MCM tasking order. Some aspects of the mission must be defined by the supporting commander.

(1) **Objectives.** The mission statement includes an objective for active MCM, an acceptable risk factor, and a specific operational area. The MCMC shall choose a specific objective (see Figure IV-4).

(a) **Exploratory.** Exploration determines whether mines are present. It is usually conducted immediately when an enemy minefield is suspected.

(b) **Reconnaissance.** Reconnaissance operations rapidly assess the limits of a mined area and estimate the number and types of mines.

(c) **Breakthrough.** The breakthrough objective is directed when open channels and staging areas for an amphibious operation or port break-in and/or break-out is rapidly required. The goal is to reduce the threat to friendly shipping passing through the mine threat area in the specified time available for MCM.

## Maritime Mine Countermeasure Mission Objectives

**Exploratory**

Determine whether mines are present.

**Reconnaissance**

Make a rapid assessment of mined area limits, types of mines, and numbers.

**Breakthrough**

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 minimize the threat of mines to ship traffic.

**Clearing**

Attempt to remove all mines from assigned areas.

**Figure IV-4. Maritime Mine Countermeasure Mission Objectives**

(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.

(e) **Clearing.** Clearing removes as many mines as possible from the assigned area to reduce risk to friendly shipping to an acceptable risk.

(2) **Risk Directives.** MCM techniques are more hazardous when used against certain mine types. To determine the proper MCM technique, the MCMC must be given direction regarding the maximum acceptable degree of risk to MCM forces, in addition to an operational objective. More restrictive time constraints increase the degree of risk.

(3) **MCM Asset Availability.** MCM tactics are determined by the threat, environment, time, and available assets. The time required for MCM forces to arrive at the mined area and the time available for completion of MCM operations are key factors. AMCM forces can provide short-notice, rapid response to any mining threat. AMCM forces usually emphasize quick response capability over fully equipped response capability and stamina to maximize response capability. SMCM forces are often better equipped and have greater stamina, but have relatively slow transit speeds and longer response times. For long distances, heavy-lift ships can transport SMCM units to the area more quickly with reduced SMCM wear and tear.

(4) **Amphibious Operations.** The preferred tactic for amphibious forces operating against countries or organizations employing coastal defenses is to avoid, bypass,

or exploit gaps in these defenses whenever possible. However, operational limitations may preclude this tactic and a breach of these defenses may be required. The capability to counter mines and obstacles is, therefore, essential to the conduct of amphibious operations. Coastal mining may interfere with littoral maneuver at sea, in the surf zone (SZ), and on the beach. Specifically, it may affect amphibious advance force operations and ship-to-shore movement, and could possibly hinder or preclude the maneuver of the LF ashore. To shape the operational environment in order to conduct the amphibious operation, MCM and amphibious breaching may be required. MCM forces will most likely be operating, at least initially, as part of an amphibious advance force during supporting operations. MCM and amphibious breaching must be synchronized within the overall amphibious force timeline. Planning a successful MCM or amphibious breach requires the combined efforts of the commander, amphibious task force (CATF), supported by the MCMC, and the commander, landing force (CLF). JFC, JFMCC, and CATF involvement may also be necessary to help ensure that sufficient MCM and breaching assets and their necessary support (includes protection and logistics while conducting MCM and breaching operations) are available. Early dialogue between these commanders will aid planners in identifying detailed mission requirements. These considerations include:

(a) **Intelligence Efforts.** A collection plan to support amphibious operations is a joint effort of the amphibious task force intelligence organizations. Intelligence efforts should identify the type and location of mine threats in the AOA, AOA characteristics, enemy locations, and obstacles in the SZ and beyond.

(b) **Synchronization.** MCM and amphibious breaching operations require precise synchronization to maximize supporting arms and to minimize risks to friendly forces. The LF scheme of maneuver and CONOPS ashore drive the ship-to-shore movement requirements, which in turn determine the general location and number of lanes. Lane requirements and obstacle construction will influence the size and composition of the breach force. Reverse planning should be used to synchronize actions at the obstacles with actions on the objective.

(c) **Breaching Fundamentals.** Suppression, obscuration, security, reduction, and assault are applied to amphibious breaching operations against obstacles under direct enemy observation and fire.

(d) **Organization.** The amphibious forces are organized to quickly and effectively reduce obstacles and expedite LF movement to the objective. Forces are generally task-organized into support, breach, and assault organizations.

(e) **C2.** Unity of command is critical to MCM and amphibious breaching operations. The CATF and the CLF share responsibility for MCM. The line of demarcation for their respective areas of responsibility for MCM depends on topographic, hydrographic, meteorological, and tactical conditions of the AOA. As in other areas of amphibious warfare where the CATF and the CLF share planning responsibility, this line of demarcation should be identified during joint planning. The CATF is responsible for MIW in the sea areas of the operational area. This includes the planning and execution of all facets of MIW (working through the MIWC or MCMC as assigned) and providing the

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

logistics support and force protection for MCM assets. The CATF conducts assault breaching operations from shallow water (SW) through the SZ and onto the beach, up to point or line of demarcation on the beach. The CLF conducts mine and obstacle breaching and clearing operations landward from the CATF and the CLF mutually agreed upon line of demarcation on the beach, and for follow-on clearance operations on the beach.

*Refer to MCWP 3-31.2/NWP 3-15,* Naval Mine Warfare; *MCRP 3-31.2A/NTTP 3-15.24,* Mine Countermeasures in Support of Amphibious Operations; *ATTP 3-90.4/MCWP 3-17.8,* Combined Arms Mobility Operations; *NTTP 3-02.1M/MCWP 3-31.5,* Ship-to-Shore Movement; *and JP 3-02,* Amphibious Operations, *for more information on MCM and breaching support to amphibious operations.*

(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 support equipment, either afloat or ashore depending upon the specific operation. 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 requirements exist for all MCM platforms.

(6) **Control Measures and Reporting.** The MCM operations report is used to exchange MCM tactical information between all components and joint headquarters. It provides the location and status of Service component MCM operations, including breaching and clearing. It is also used to request, task, plan, report, modify, and approve MCM operations, as appropriate. The report format is specified in Military Standard-6040, *US Message Text Formatting Program*, and listed in Appendix A, "Land Forces Reports."

(a) **Structured Operation Tasking MIW Support.** The operation task (OPTASK) series of structured messages provides functional warfare area (e.g., MIW, strike, communications) specific policy and guidance. SMWDC prepares and submits the USN-wide OPTASK MIW message and subsequent updates or changes to Third Fleet for review and promulgation by Commander, United States Fleet Forces Command (USFF)/Commander, United States Pacific Fleet (COMUSPACFLT) (SMWDC and Commander, Mobile Mine Assembly Group, provide input to the standing USN-wide OPTASK message for mining operations). The standing USN-wide OPTASK MIW should be supplemented by numbered fleet commanders regarding mission and area of operations specifics, including issuance of fleet-level OPTASK MIW and/or 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.

(b) **Mine Report.** The mine countermeasure report (MCMREP) is used by individual MCM organizations or a commander, task unit, to report results of MCM operations. The MCMC will specify the frequency for MCM assets or commander, task unit, to submit MCMREPs.

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

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, US Northern Command, and Commander, US Pacific Command, including support for domestic MIW operations.

(2) **SMWDC** provides oversight of USN MIW programs and training and readiness of MIW forces that include AMCM, SMCM, UMCM, and MCMRONs, that can deploy on short notice to support CCDRs, as required. SMWDC 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 MCM Operations.** Integrated MCM operations optimize available MCM assets and tactics to meet the needs of the mission. Consideration must be given to both mutual support and mutual interference. For example, 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, this presents 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.

(2) **Multinational Force Coordination.** Operations against enemy mining are often carried out by a multinational MCM effort. MCM operations 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 shipping routes that can be activated partially or totally by the area commander after determining that mining is imminent or has occurred. Activating Q-routes minimizes the area an MCMC has to clear to provide safe passage for shipping and reduces the force required to conduct MCM. Survey operations are conducted along Q-routes during peacetime to determine if the route is favorable for minehunting. If it is not, a change of route may be required. Once established, the route is surveyed to collect environmental and contact data to support wartime operations. The route is periodically surveyed to locate, evaluate, and catalog contacts and environmental changes. 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.

*For additional information on naval MCM capabilities, refer to Appendix B, "Service Specific Capabilities."*

## 7. Service Considerations

a. **Army-Navy.** Naval MIW includes mining and MCM in all sea areas, the littoral operating area in an amphibious operation to include the SZ and the beach (as determined in the planning process), and in certain cases may extend inland where waters are navigable from the sea. In short, if maritime assets are capable of conducting MCM in any waterway where Army craft need to navigate, it is likely that the NCC or JFMCC 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 operations or campaigns. Commanders, confronted by a mining threat, will

request MCM assets through the CCDR. In some cases, combined MCM forces or forces from the North Atlantic Treaty Organization or other allied nations may, after appropriate national coordination, provide MCM.

b. **Air Force-Navy.** The USAF plays two important roles in supporting MIW forces (in addition to supporting offensive MCM). First, USAF bomber aircraft can deliver large quantities of mines per sortie at long distances from their bases, playing a critical part in accomplishing mining plans directed by joint commands. USAF aircraft are also a key component of the joint direct attack munition assault breaching system in support of amphibious operations. The second USAF role is the Air Mobility Command's (AMC's) deployment of AMCM and UMCM forces, and MIW C2 elements and the continuing delivery of critical repair parts via AMC aircraft. Under US Transportation Command direction, AMC integrates its effort in support of MCM with heavy sealift of SMCM platforms or personnel and materiel.

c. **Marine Corps-Navy.** During amphibious operations, MCM at sea—whether in the deep or SW where amphibious warfare ships and their escorts operate, or in the very shallow water (VSW) and SZ where assault craft bring troops and weapons to the beach—is conducted by a Navy MCMC. Normally, the MCMC is a subordinate and supporting commander to the CATF. MCM in the sea areas will be performed by a combination of the "MCM triad" of SMCM, AMCM, and UMCM assets; MCM in the VSW will be performed by UMCM. When insertion of US Marine Corps forces (other than those already embarked on amphibious shipping) is accomplished by airlift of personnel to a permissive location where they can be united with equipment stored on maritime pre-positioning ships squadron (MPSRON) ships, USN MCM assets may be required to assure access to seaports of debarkation for the use of those MPSRON vessels. 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 (USCG).** 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 US Northern Command and US Pacific Command. USCG area commanders assign appropriate USCG forces to the 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 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.

*For additional information on naval mining capabilities, refer to Appendix B, "Service Specific Capabilities."*

## 8. Navy Salvage Support

Navy salvage operations support the establishment and maintenance of ports and LOCs during military operations. This support may include, but is not limited to, port/harbor clearance, towing/heavy lift operations, the emergency repair of combatant vessels aground to towing damaged vessels to an established safe zone for repair or reconstitution. It may also include the removal of material from a sunken aircraft or vessel in order to limit the exposure of classified material to enemy forces and to clear a navigation channel or pier access.

*For more information on Navy salvage capabilities, see NWP 4-12,* Navy Salvage Operations.

# APPENDIX A
## LAND FORCES REPORTS

Minefield reports will be submitted by the emplacing unit commanders through operations channels to the appropriate operations officer or operations directorate of a joint staff of the authorizing headquarters. That headquarters will integrate the reports with terrain analysis and disseminate them as tactical information. The reports should be sent by secure means. Once emplaced and activated, minefields are lethal and unable to distinguish between friendly forces 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.

1. **Enemy/Friendly Unit/Minefield/Obstacle Report.** 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.

General Instructions: Use to report all obstacles on the battlefield after developing a report. Disseminate information and report to all command posts and units in the area of operation as soon as possible. From FM 6-99, *US Army Report and Message Formats*:

**ENEMY/FRIENDLY/UNIT MINEFIELD/OBSTACLE REPORT**

| | |
|---|---|
| LINE 1—DATE AND TIME_____ | (DTG) |
| LINE 2—UNIT_____ | (unit making report) |
| LINE 3—EMPLACING UNIT_____ | (emplacing unit, if known) |
| LINE 4—APPROVING AUTHORITY_____ | (approving authority, if required or known) |
| LINE 5—TARGET/OBSTACLE NO._____ | (target or obstacle number, if required or known) |
| LINE 6—TYPE OF EMPLACING SYSTEM_____ | (type of emplacing system, if required or known) |
| LINE 7—TYPE MINES/OBSTACLES_____ | (type of mine or obstacle, if known, include width and depth) |
| LINE 8—TYPE MARKING SYSTEM_____ | (type minefield or obstacle marking system, if emplaced) |
| LINE 9—LIFE CYCLE DTG_____ | (DTG of life cycle or self-destruct time, if known) |
| LINE 10—CORNER LOCATIONS_____ | (UTM or six-digit grid coordinate with MGRS grid zone designator of corners) |

| | |
|---|---|
| LINE 11—REDUCE_____ | (obstacle or minefield reduced: YES or NO) |
| LINE 12—NO. OF LANES_____ | (number of lanes) |
| LINE 13—REDUCTION ASSET USED_____ | (MICLIC, mine plow, mine roller, demolitions, and so on) |
| LINE 14—WIDTH_____ | (width of lane) |
| LINE 15—DEPTH_____ | (depth of lane) |
| LINE 16—GRID TO START OF LANE_____ | (UTM or six-digit grid coordinate with MGRS grid zone designator of start of lane [entrance]) |
| LINE 17—GRID TO END OF LANE_____ | (UTM or six-digit grid coordinate with MGRS grid zone designator of end of lane [exit]) |
| LINE 18—LANE MARKING_____ | (type of marking system, if emplaced) |
| LINE 19—BYPASS_____ | (YES or NO) |
| LINE 20—BYPASS GRID_____ | (UTM or six-digit grid coordinate with MGRS grid zone designator to bypass) |
| LINE 21—BARRIERS_____ | (concertina wire, pickets, and/or trenches, and any other obstacle information necessary) |
| LINE 22—NARRATIVE_____ | (free text for additional information required for report clarification) |
| LINE 23—AUTHENTICATION_____ | (report authentication) |

DTG date-time group
MGRS military grid reference system
MICLIC mine clearing line charge
NO. number
UTM universal transverse mercator

2. **Scatterable Nonpersistent Minefield Reporting.** Accurate, timely, and uniform reporting and dissemination of scatterable nonpersistent minefield emplacement information is a must. Fluid and fast-moving tactical situations require that complete information on scatterable nonpersistent 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 nonpersistent minefields must also be recorded to facilitate clearing of possible UXO/duds. Shown below is a relatively simple reporting procedure that will be used for scatterable nonpersistent mines. It is applicable for all delivery systems and can be sent in a voice, digital, or hard copy mode. As in FM 6-99, *US Army Report and Message Formats*:

(a) Scatterable Minefield Warning

General Instructions: Use to request authority to execute a planned scatterable minefield (SCATMINE) obstacle. Use the SCATMINREQ to request authority to plan a SCATMINE obstacle and the scatterable minefield report (SCATMINREC) to record an executed SCATMINE obstacle.

**SCATTERABLE MINEFIELD WARNING**

LINE 1—DATE AND TIME_____ (DTG)

LINE 2—UNIT_____(unit making report)

LINE 3—TGT OR OBSTCL NO._____(target or obstacle number)

LINE 4—EMPLACING SYSTEM_____ (Emplacing System)

LINE 5—ANTIVEHICULAR MINES_____ (YES or NO)

LINE 6—ANTIPERSONNEL MINES_____ (YES or NO) Only authorized for employment on Korean Peninsula

LINE 7—AIM POINTS_____ (grid coordinates of aim points or corner points, if required, due to refinement when authorized)

LINE 8—SAFETY ZONE_____ (size of safety zone)

LINE 9—MINEFIELD MARKING_____ (type of marking)

LINE 10—LIFE CYCLE_____(DTG of life cycle planned)

LINE 11—ACTIONS_____(actions taken by personnel involved)

LINE 12—NARRATIVE_____(free text for additional information required for report clarification)

LINE 13—AUTHENTICATION_____ (report authentication)

| | | | |
|---|---|---|---|
| DTG | date-time group | OBSTCL | obstacle |
| NO. | number | TGT | target |

(b) Scatterable Minefield Request

General Instructions: Use to request authority to plan emplacement of SCATMINE. IAW unit SOPs or the SCATMINE planning and execution policy, units will prepare and submit SCATMINREQ in enough time to allow the request to be staffed at the appropriate level and approval or disapproval returned to the requesting unit. Once a unit receives permission to plan a SCATMINE obstacle, it must still receive release authority before proceeding. This process is normally given when a scatterable minefield warning (SCATMINWARN) is sent 30 minutes prior to execution and the higher commander acknowledges and approves the release. Once the minefield is in place, a minefield/obstacle report (SCATMINREC) is sent to register the minefield. This is key, as the minefield may be on a unit boundary or beyond the FLOT. As in FM 6-99, *US Army Report and Message Formats*:

**SCATTERABLE MINEFIELD REQUEST [SCATMINREQ]**

| | |
|---|---|
| LINE 1—DATE AND TIME_____ | (DTG) |
| LINE 2—UNIT_____ | (unit making report) |
| LINE 3—TGT OR OBSTCL NO._____ | (target or obstacle number) |
| LINE 4—EMPLACING SYSTEM_____ | (emplacing system) |
| LINE 5—ANTIVEHICULAR MINES_____ | (YES or NO) |
| LINE 6—ANTIPERSONNEL MINES_____ | (YES or NO) Only authorized for employment on Korean Peninsula |
| LINE 7—ATTITUDE_____ | (attitude of minefield) |
| LINE 8—DIMENSIONS_____ | (DTG of life cycle planned) |
| LINE 9—AIM POINTS_____ | (aim points or center point of the minefield) |
| LINE 10—SAFETY ZONE_____ | (size of safety zone) |
| LINE 11—MINEFIELD MARKING_____ | (type of marking) |
| LINE 12—UNIT OBSERVING_____ | (unit observing) |
| LINE 13—MISSION_____ | (task, purpose, and intent) |
| LINE 14—LIFE CYCLE_____ | (DTG of life cycle planned) |
| LINE 15—ACTIONS_____ | (actions taken by personnel involved) |
| LINE 16—NARRATIVE_____ | (free text for additional information required for report clarification) |

LINE 17—AUTHENTICATION_____ (report authentication)

| | | | |
|---|---|---|---|
| DTG | date-time group | SCATMINE | scatterable mines |
| NO. | number | TGT target | |
| OBSTCL | obstacle | | |

(c) Scatterable Minefield Record

GENERAL INSTRUCTIONS: Use to report emplacement of SCATMINE. IAW unit SOPs or SCATMINE planning and execution policy, units will prepare and submit SCATMINREC in enough time to allow the request to be disseminated to all affected units. Once executed, it is critical to report each obstacle as a separate SCATMINREC to ensure it gains immediate visibility. (Placing SCATMINREC in the obstacle database, which is how most of the normal obstacles will be reported, slows dissemination.) This is especially important if the obstacle is on a unit boundary or beyond the FLOT. As in FM 6-99, *US Army Report and Message Formats*:

**SCATTERABLE MINEFIELD RECORD**

LINE 1—DATE AND TIME_____ (DTG)

LINE 2—UNIT_____ (unit making report)

LINE 3—TGT OR OBSTCL NO._____ (target or obstacle number)

LINE 4—EMPLACING SYSTEM_____(emplacing system)

LINE 5—ANTIVEHICULAR MINES_____ (YES or NO)

LINE 6—ANTIPERSONNEL MINES_____(YES or NO) Only authorized for employment on Korean Peninsula

LINE 7—LIFE CYCLE_____ (DTG of life cycle planned)

LINE 8—AIM POINTS_____(aim points or center point of the minefield)

A._____(UTM or six-digit grid of one corner)

B._____(UTM or six-digit grid of one corner)

C._____(UTM or six-digit grid of one corner)

D._____(UTM or six-digit grid of one corner)

LINE 9—EMPLACING_____(unit emplacing mines and report number)

LINE 10—SAFETY ZONE_____(size of safety zone)

LINE 11—MINEFIELD MARKING_____(type of marking)

LINE 12—APPROVING AUTHORITY_____(approving authority commander)

LINE 13— REPORT POC _____ (person completing this report)

LINE 14—ACTIONS_____ (actions taken by personnel involved)

**Repeat lines 3 through 14 to report multiple minefields. Assign sequential lines to succeeding iterations. For example, first iteration is 3 through 14; second iteration is 3a through 14a; third iteration is 3b through 14b; and so on.

LINE 15—NARRATIVE_____(free text for additional information required for report clarification)

LINE 16—AUTHENTICATION_____ (report authentication)

| | | | |
|---|---|---|---|
| DTG | date-time group | SCATMINE | scatterable mines |
| NO. | number | TGT | target |
| OBSTCL | obstacle | UTM | universal transverse mercator |
| POC | point of contact | | |

3. **UXO/ERW Reporting.** 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 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. As in FM 4-30.51/MCRP 3-17.2A, *Unexploded Ordnance (UXO) Procedures*:

LINE 1—DATE TIME GROUP_____DTG item was discovered.

LINE 2—REPORTING ACTIVITY_____ (Unit identification code) and location (grid of UXO).

LINE 3—CONTACT METHOD_____ Radio frequency, call sign, point of contact and telephone number.

LINE 4—TYPE OF ORDNANCE_____ Dropped, projected, placed or thrown. If available, supply the subgroup. Give the size of the hazard area.

| | |
|---|---|
| LINE 5—CBRN CONTAMINATION_____ | Be as specific as possible. |
| LINE 6—RESOURCES THREATENED_____ | Report any equipment, facilities, or other assets that are threatened. |
| LINE 7—IMPACT ON MISSION_____ | Provide a short description of current tactical situation and how the presence of UXO affects mission. |
| LINE 8—PROTECTIVE MEASURES_____ | Describe any measures you have taken to protect personnel and equipment. |
| LINE 9—RECOMMENDED PRIORITY_____ | Recommend a priority for response by EOD or engineers. |

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# APPENDIX B
## SERVICE SPECIFIC CONSIDERATIONS

### 1. Land Mobility Capabilities

a. **Operational Environment.** The operational environment includes significant challenges to both mobility and maneuver. 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 to provide a concise discussion of enemy countermobility capabilities and their employment of land mines and other EHs. It includes a discussion of the US units and potential capabilities to provide mobility and support to movement and maneuver against these countermobility capabilities.

(1) **Land Mines.** Whether buried conventionally in patterns, emplaced 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 maneuver advantages. Highly developed adversaries may employ large numbers of scatterable mines. Less developed adversaries are likely to employ more persistent mines and other explosive obstacles in lieu of scatterable mines. Terrorists will obtain and employ land mines in any manner possible to inflict losses on our friendly forces as well as civilians. 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 APLs and AVLs with numerous types of firing mechanisms (see FM 3-34.210/MCRP 3-17.2D, *Explosive Hazards Operations;* Training Circular [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.

(2) **EHs.** An EH is any hazard containing an explosive component. FM 3-90.119, *Combined Arms Improvised Explosive Device (IED) Defeat Operations*, describes EHs currently encountered in five categories: UXO (including land mines), booby traps (some booby traps are nonexplosive), IEDs, captured enemy ammunition, 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/MCRP 3-17.2D*, Explosive Hazards Operations, *for additional supporting information.*

(a) **The IED 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 US and friendly forces' 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 create initial effects 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. In an IED environment, the information derived from the technical exploitation of IEDs is critical to development of force protection measures and to the conduct of attacking enemy networks. If time permits, EOD personnel should have the opportunity to render safe and process IEDs for technical exploitation.

*For more information on IEDs and countering IEDs, see JP 3-15.1,* Counter-Improvised Explosive Device Operations.

(b) **UXO.** UXO includes ordnance items that have been fired, projected, dropped, or placed in such a way that they propose a hazard to personnel or property. 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 ATTP 4-32.2/MCRP 3-17.2B/NTTP 3-02.4.1/AFTTP 3-2.12,* Multi-Service Tactics, Techniques, and Procedures for Unexploded Ordnance, *and ATTP 4-32.16/MCRP 3-17.2C/NTTP 3-02.5/AFTTP 3-2.32,* Multi-Service Tactics, Techniques, and Procedures for Explosive Ordnance Disposal.

b. **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.

c. **Mobility Units and Capabilities**

(1) **Army**

(a) **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 an organic combat engineer battalion with combat and general engineering capabilities, as well as engineers on staff to provide geospatial engineer expertise and engineer planning capability. 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 (PLTs). Additional information on the structure of each of the BCTs and their subordinate units can be found in FM 3-90.6, *Brigade Combat Team*. Additional information on the capabilities and structure of the organic combat engineers can be found in FM 3-34, *Engineer Operations*, and Army Techniques Publication, 3-34.22, *Engineer Operations-Brigade Combat Team and Below*.

(b) **Augmenting Mobility Units and Capabilities.** The organic structure of the BCT does not provide all the combat engineer mobility support needed to conduct mobility operations. The BCT may need additional breaching, clearing, gap crossing, or other selected capabilities based on mission requirements capabilities that reside in echelons above brigade engineer battalions (BEBs). The BCT commander and staff must identify and address required capability shortfalls through mission analysis and augmentation coordination with non-BCT engineer commanders.

1. **Engineer Augmentation.** The BEB is the organic engineer capability within the BCTs and it may require augmentation to support countermobility operations exceeding their close CS capability. Engineer units and capabilities likely to augment the BCT in mobility operations include the combat engineer company, mobility augmentation company, clearance company, area clearance PLT, engineer support company, explosive hazards coordination cell (EHCC), and engineer mine dog detection unit. For combined arms breaching operations, the BCT will generally require augmentation by one or two mobility augmentation companies or sapper companies and additional route clearance PLTs. 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 companies, area clearance PLTs or other combat engineer elements (and perhaps an engineer mine dog detection team). The EHCC's mission is to predict, track, distribute information on, and mitigate EHs within the theater that affect force application focused logistics, survivability, and awareness of the operational environment. The EHCC maintains an EH database, conducts pattern analysis, investigates mine and IED strikes, and tracks UXO hazard areas. The cell provides technical advice on the mitigation of EH, including the development of TTP, and provides

training updates to field units. 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.

### 2. Other Mobility Support Augmentation

a. **EOD** units provide the capability to neutralize hazards from conventional UXO, IED, CBRN 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.

b. **Rotary-wing 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, and support the BCT's ability to maneuver and bypass obstacles.

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

(1) CBRN Reconnaissance PLT (infantry brigade combat team [IBCT]). This PLT conducts dismounted CBRN reconnaissance and surveillance, CBRN consequence management support, site exploitation support, and hazardous materials mitigation support.

(2) CBRN Reconnaissance PLT (armored brigade combat team [ABCT]). This PLT conducts mounted CBRN reconnaissance and surveillance, site exploitation support, and biological surveillance if properly equipped.

(3) CBRN Reconnaissance PLT (Stryker brigade combat team [SBCT]). This PLT conducts mounted CBRN reconnaissance and surveillance, site exploitation support, and biological surveillance if properly equipped.

(4) CBRN Decontamination PLT (Heavy). This PLT conducts thorough equipment and troop decontamination, mass casualty decontamination, patient and contaminated remains decontamination support, and hazardous materials mitigation.

(5) CBRN Decontamination PLT (Light). This PLT conducts operational level decontamination, provides support for mass casualty and human remains decontamination, and provides hazardous materials mitigation.

(6) CBRN PLT (Obscuration) (Mechanized). This PLT conducts sustainment and temporary obscuration.

d. CA forces play an important role in supporting mobility through the development, coordination, and execution of CA operations that positively influence target populations to support the commander's objectives. CA are designed to provide the maneuver commander direct interaction with the civilian populace through the conduct of civil reconnaissance and assessments of the civil component of the operational area. Through their interaction with the indigenous populations and institutions, CA forces can minimize the negative impact of military operations on civilian populations and the level of interference of civilians on military operations. This can be critical during populace and resources control operations which could include planning and coordinating with other stakeholders for options such as:

(1) Keeping the populace in place.

(2) Identifying potential dislocated civilian routes.

(3) Coordinating the movement of dislocated civilians.

(4) Assisting in relocation operations.

*For additional information on the functions and capabilities of CA forces, see JP 3-57,* Civil-Military Operations, *and FM 3-57,* Civil Affairs Operations.

e. **Tactical-level military information support operations** can degrade the enemy's combat power, reduce civilian interference, minimize collateral damage, and increase the population's support for operations. Military information support personnel assist the commander by encouraging civilians to avoid military operations, installations, and convoys.

(2) **Marine Corps.** The Marine Corps deploys units based on the MAGTF construct. Each MAGTF consists of four elements: the command element, ground combat element (GCE), aviation combat element, and logistics combat element (LCE).

(a) The GCE of all MAGTFs includes task-organized combat engineer detachments that provide mobility and countermobility support. They range in size from a PLT reinforced, a company reinforced, to an entire combat engineer battalion (CEB).

(b) Combat engineer PLTs and companies can be reinforced by elements of the CEB's mobility assault company and engineer support company. The mobility assault company consists of one assault breaching PLT, one assault bridging PLT, and two route reconnaissance and clearance PLTs with three route clearance teams each. Engineer support company consists of heavy equipment and motor transport assets to transport it.

(c) The LCE of all MAGTFs includes task-organized engineer support battalion (ESB) detachments that provide general support, general engineering, and combat engineering (mobility/countermobility) and EOD. Engineer PLTs and companies can be reinforced by elements of engineer support company, bridge company, and EOD company. In addition to the ESB within the LCE, there is a combat logistics battalion with an engineer services company that provides direct general support, general engineer support, and limited combat engineer support.

*For additional information about Marine Corps engineer units and capabilities, see JP 3-34,* Joint Engineer Operations; *MCWP 3-17,* Engineering Operations; *and MCWP 3-17.2,* MAGTF Explosive Ordnance Disposal.

## 2. Land Countermobility Capabilities

a. **Employment of Barriers, Obstacles, and Mines.** As with 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.

(1) **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 be 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.

(2) **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 be a combination of the two. The effectiveness of obstacles is enhanced considerably when covered by observation and fire. Obstacles include abatis, anti-vehicle ditches, blown bridges, built-up areas, earth-filled bastions, prefabricated concrete sections, minefields, rivers, road craters, terrain, and wire. As mentioned above, mines are employed in combination with other obstacles to create complex obstacles.

(3) **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 scatterable mines and/or networked munitions. By presidential directive, US forces may no longer use non-self-destructing land mines, except to train personnel engaged in demining and countermine operations. Landmines will only be employed in accordance with US law and policy. The use of the M18A1 Claymore used in the command-detonation mode is not restricted under international law or US law or policy. Tactical minefield effects include disrupt, turn, fix, and block. Minefields are used to:

(a) Produce a vulnerability to enemy maneuver that can be exploited by friendly forces.

(b) Cause the enemy to deploy forces early.

(c) Interfere with enemy C2.

(d) Inflict damage to enemy personnel and equipment.

(e) Exploit the capabilities of other weapon systems by delaying enemy forces in an engagement area.

(f) Protect friendly forces from enemy maneuver and infiltration.

(4) **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.

(a) **Protective minefields** are employed to protect the force, equipment, supplies, and facilities from enemy attacks or other threats. Protective minefields are usually employed and emplaced at the small-unit level (PLT 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 emplaced 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 emplaced so that they are easy to detect and recover by the emplacing 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.

(b) **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 it to prematurely commit limited breaching resources, and reducing its 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.

(c) **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. Self-destruct/self-deactivating mines, scatterable mines, and/or networked munitions may be used in nuisance minefields.

(d) **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.

(5) 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.

(6) **Types of Mines**

(a) **AVLs.** AVLs are designed to immobilize or destroy vehicles and their occupants.

1. **Types of Kills.** An AVL 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.

2. **Types of Fuzes.** Anti-vehicle fuzes fall into three design categories:

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

b. **Full-width.** Activated by several methods—acoustics, magnetic influence, tilt-rod, radio frequency, infrared sensor, command, or vibration. Tilt-rod or magnetic-influence fuzes are the most common. Full-width fuzes 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 fuze 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.

c. **Off-route.** Designed to be placed along the side of a route likely to be taken by armored vehicles. It has numerous fusing 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.

3. **Types of Warheads.** AVLs can be identified by their warheads:

a. Blast AVLs 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.

b. 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.

c. 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.

(b) **APLs.** APLs are designed to be exploded by the presence, proximity, or contact of a person and will incapacitate, injure, or kill one or more persons. APLs will only be employed in accordance with US law and policy.

1. **Types of Kills.** APLs 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 APLs may break or damage the track on armored vehicles.

2. **Types of Fuzes.** APLs can be fuzed in many ways, to include pressure, seismic, wire, or command detonation:

a. Pressure fuzes usually activate an APL when a load is placed on the fuze.

b. Seismic fuzes activate an APL when the sensor detects vibrations.

c. Trip wires or break wires activate an APL when something disturbs barely visible wires.

d. Command-detonated mines are activated by an individual when he detects the enemy in the mine's blast area.

3. **Types of Effects.** APLs contain five types of effects:

a. **Blast.** Cripples the foot or leg of an individual who steps on it, can also burst the tires of a wheeled vehicle that passes over it.

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

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

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

e. **Chemical.** Disperses chemical threats and hazards to whoever activates it; contaminates the surrounding area. The US does not use chemical mines.

(c) **AHDs.** AHDs perform the function of a mine fuze 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. However, a small percentage of US artillery-delivered AVLs have AHDs built into them. Although the Volcano, Modular Pack Mine System, and Gator mines do not have AHDs, they have an inherent anti-handling capability since they may detonate when moved because the mine may sense a significant change from its original orientation. Other countries continue to employ AHDs on AVLs and APLs. Some mines have extra fuze 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. In accordance with the CCW and Ottawa Convention, AVLs with AHD are not considered APLs. AVLs and AHD will only be employed in accordance with US law and policy.

b. **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.

c. **Countermobility Units and Capabilities**

(1) **Army**

(a) **Organic Countermobility Units and Capabilities.** BCTs are strategically flexible. The major combat and support capabilities a brigade needs for most operations are organic to its structure. Each BCT has one organic BEB with two combat engineer companies with capabilities focused on supporting combined arms countermobility. 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 PLTs. Additional information on the structure of BCTs and their subordinate units can be found in FM 3-90.6, *Brigade Combat Team*. 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 Army Techniques Publication 3-34.22, *Engineer Operations—Brigade Combat Team and Below*.

(b) **Augmenting Countermobility Units and Capabilities.** The organic structure of the BCT does not provide all the combat engineer and other elements needed to conduct countermobility operations. 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 mission analysis and augmentation coordination with non-BCT engineer commanders.

1. **Engineer Augmentation.** The BEB may require augmentation to support countermobility operations exceeding their capability. BEBs organic to the ABCT and SBCT are equipped with Volcano mine dispensers. The BEB organic to the IBCT has no organic Volcano mine dispensing equipment. The engineer force pool for countermobility capability is the same for mobility capability. For a deliberate defense, a BCT has organic countermobility capability in its BEB engineer companies to emplace obstacles using its combat engineer PLTs, as well using its earthmoving capability to emplace berms and tank ditches. Depending on the enemy, the required obstacle size, the terrain, and the time available, the BCT BEB may require augmentation from an echelons

above brigade engineer battalion. Engineer units and capabilities likely to augment the BCT in countermobility operations include the sapper company, mobility augmentation company, combat engineer company, and engineer support company. The type and number of augmentation units required will vary with METT-T.

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

### 2. Other Countermobility Support Augmentation

a. Rotary-wing 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 scatterable mines, and support the BCT's ability to maneuver in relation to the natural or emplaced obstacles. For operations outside the Korean Peninsula, the only air-delivered scatterable mines available for employment are the helicopter delivered AVL Volcano.

b. 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.

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

(1) CBRN Reconnaissance PLT (IBCT). This PLT conducts dismounted CBRN reconnaissance and consequence management support.

(2) CBRN Reconnaissance PLT (ABCT). This PLT conducts mounted CBRN reconnaissance and can conduct biological surveillance if properly equipped.

(3) CBRN Reconnaissance PLT (SBCT). This PLT conducts mounted CBRN reconnaissance and can conduct biological surveillance if properly equipped.

(4) CBRN Decontamination PLT (Heavy). This PLT conducts thorough equipment and troop decontamination.

(5) CBRN Decontamination PLT (Light). This PLT conducts operational level decontamination.

(6) CBRN PLT (Obscuration) (Mechanized). This PLT conducts sustainment and temporary obscuration.

(7) CBRN PLT (Obscuration) (Wheeled). This PLT conducts sustainment and temporary obscuration and MILDEC operations.

(2) **US Marine Corps.** The GCE of all MAGTFs includes task-organized combat engineer detachments that provide mobility and countermobility support. These detachments are sourced from the Marine division's CEB. The ESB combat logistics battalions of the Marine logistics group provide general engineering support in support of MAGTF countermobility requirements. The Marine wing support squadron of the aviation combat element provides limited countermobility support, especially at MAGTF air facilities.

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

## 3. Maritime Mining Capabilities

### a. The Minefield

#### (1) The Minefield Compared with Other Weapons

(a) In naval warfare, a minefield is an area of water containing mines emplaced with or without a defined pattern. If the field is not declared or the mine emplacement operation goes unobserved, it may not create its desired effect until sometime 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. Note: A mine sterilizer is a countermeasure device designed to make a mine harmless after a preset number of days.

(b) When used, mines have inflicted disproportionate casualties compared with the mine emplacement 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 objectives.

(c) 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. Optimum minefield design enables mining forces to achieve their objectives without excessive mining effort. Although neutralizing a single mine can prove easy, an entire minefield is challenging.

(2) **Types of Minefields.** Naval minefields can be characterized by their purpose and where they are laid, as follows:

(a) Offensive minefield: a minefield laid in enemy territorial water or waters under enemy control.

(b) Defensive minefield: a minefield laid in international waters or international straits with the declared intention of controlling shipping in defense of sea communications.

(c) Protective minefield: a minefield laid in friendly territorial waters to protect ports, harbors, anchorages, coasts, and coastal routes.

(3) **Mine Classification.** Naval mines are typically classified in one of three ways:

(a) Final position in the water. Discussed in follow-on paragraphs.

(b) Method of actuation. This includes contact, magnetic, acoustic, seismic, and pressure.

(c) Method of delivery. This includes air, surface, and submarine.

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

(a) Bottom mines.

**In US usage, the term "bottom mine" is always used, and the term "ground mine" should be avoided. In allied usage, while "bottom mine" is the preferred usage, the term "ground mine" is still used in some contexts.**

(b) Moored mines.

(c) Moving mines.

(5) **Bottom Mines**

(a) Bottom 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.

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

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

2. 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.

(6) **Moored Mines**

(a) 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. The mines 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. Using moored mines can avoid problems that bottom mines may encounter in deep water. 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 emplaced.

(b) 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.

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

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

2. 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.

(7) **Moving Mines.** Moving mines are classified as either drifting or oscillating mines.

(a) **Drifting Mines**

1. 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.

2. Drifting sea mines which do not self-destruct or self-deactivate within one hour are banned from international waters by the Hague Convention VIII of 1907 relative to the Laying of Automatic Submarine Contact Mines. 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. It is also forbidden to lay anchored automatic contact mines which do not become harmless as soon as they have broken loose from their moorings.

3. 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.

(b) **Oscillating Mines**

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

2. 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.

b. **US and Allied Mine Emplacement Assets**

(1) 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:

(a) Type of minefield (defensive, offensive, or protective).

(b) Number and type of mines to be delivered.

(c) Number of sorties required.

(d) Defensive capabilities in area, attrition rate expected for delivery vehicles, and the need for standoff delivery systems.

(e) Environmental characteristics, such as water depth and bottom composition.

(f) Required accuracy in delivery.

(g) Logistics for coordinating stockpiled mines and delivery systems.

(2) **US Mine Inventory.** The US mine inventory consists of a variety of air- and submarine-delivered, influence-actuated mines. Sizes vary and include 500 to 2,000 pounds. The US mining program is designed to support offensive, defensive, and protective mining operations. Detailed discussion of these systems can be found in NTTP 3-15.1, *Maritime Mining*.

(3) **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.

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

1. Aircraft can penetrate areas inaccessible to ships and submarines and can replenish existing fields without danger from previously emplaced sea mines.

2. Aircraft have a faster reaction time than surface ships or submarines.

3. Aircraft are generally more readily available and can typically complete their mining mission quickly.

4. Aircraft can carry a wide variety of naval mines.

(b) **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.

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

2. Mine emplacement accuracy of aircraft is lower than for a surface ship but is adequate for offensive mining.

3. Many aircraft types can be restricted by weather conditions.

4. The range of aircraft without aerial refueling support is more restricted than that of surface ships or submarines.

5. In general, aircraft deploy mines in a less clandestine manner than submarines (but more so than surface ships).

6. Aircraft are vulnerable to enemy defenses, especially if the area to be mined is within the envelope of an enemy integrated air defense system.

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

(4) **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 emplace 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.

(a) **Advantages of Submarine Delivery.** The advantages of submarine-delivered mines are:

1. The clandestine nature of submarine delivery.

2. Mission radius.

3. Unrestricted by weather conditions.

(b) **Disadvantages of Submarine Delivery.** The disadvantages of submarine-delivered mines are:

1. Limited payloads and weapons mix.

2. Slow reaction time (i.e., if not loaded with mines for a contingency, submarine must return to a port for loading of naval mines).

3. Slow transit speed when compared with aircraft delivery.

4. Submarine availability with respect to competing mission requirements.

5. Delay incurred in reconfiguring mines to fit a torpedo tube.

6. Cannot replenish existing fields without danger from previously laid sea mines.

(5) **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 emplace sea mines by hoisting or rolling them over the side or by using temporarily installed mine rails or tracks. There are no active US mine emplacing surface ships in service today. However, should an operational requirement develop, it is possible to configure ships to emplace mines. Suitable conversion of cargo ships is also an option. Some allies do have a surface mine emplacement capability.

(a) **Advantages of Surface Delivery**

1. Able to carry a larger payload than aircraft or submarine mine emplacers.

2. Surface assets have the ability to position mines more accurately than the other delivery assets.

(b) **Disadvantages of Surface Delivery**

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

2. Surface mine emplacement is not clandestine.

3. They are vulnerable to attack, so they are not effective offensively.

4. Surface ships are unable to replenish existing minefields.

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

## 4. Naval Mine Warfare and Mine Countermeasures Organization and Capabilities

a. **Naval MIW Force Organization.** The Commander, USFF, and COMUSPACFLT are the administrative and operational commanders for the naval MIW forces. When other fleet commanders require naval MIW support, forces are provided through the numbered fleet commanders, with SMWDC coordination. Commander, USFF, and COMUSPACFLT normally exercise operational control over Navy Munitions Command (NMC) units—deployable mine assembly teams which are administratively consolidated with larger NMC detachments. These NMC units are directed by Commander, Mobile Mine Assembly Group, in response to mine-build orders generated by the SMWDC MIW staff or the designated MIWC. The respective type commanders are responsible for naval MIW force readiness, and SMWDC, as the USN principal naval MIW command, is responsible for the integrated training, tactics, and interoperability of the naval MIW forces. These forces are required to be prepared to deploy on short notice to meet the CCDR's operational requirements. SMWDC maintains a deployable, scalable naval MIW staff to support fleet or combatant command staffs and provides technical advice to the North Atlantic Treaty Organization and allied countries. Additionally, the USN maintains deployable tactical MCMRONs that report to SMWDC or other designated commander. These MCMRONs are operational staffs that exist to exercise tactical C2 of specified MCM forces (air, surface, and underwater).

b. **Command Relationships and Mission-Related Terminology.** The following command relationships are defined by joint doctrine, but are presented here for clarification as they relate to naval MIW-MCM (mining forces are considered strike warfare assets and are not discussed here). Assigned MCM units are placed within a command organization on a relatively permanent basis. An Avenger Class ship that deploys as part of an MCM task unit (TU) is an example of assigned MCM units.

(1) **Attached.** MCM units are temporarily placed within a command organization for short duration and specific operation. An Avenger Class ship operating within a strike group to protect maneuver space is an example of an attached MCM unit.

(2) **Supporting.** MCM units that operate in general, mutual, direct, or close augmentation of a supported force, but remain assigned or attached to the supporting force commander.

c. **MCM Force Response Categories.** MCM forces fall into three categories based on response capability:

(1) **Immediate Response Force.** Immediate response forces are MCM forces in theater and in close proximity available for countering imminent threats and protecting maneuver space. Immediate response forces are structured to provide MCM coverage rates that permit freedom of maneuver with minimal delay.

(2) **Rapid Response Force.** Rapid response forces are MCM contingency forces that can quickly arrive in theater. They consist of continental United States (CONUS)-based, rapidly deployable forces and in-theater, forward-deployed naval forces, available to commence operations within 96 hours. The rapid response forces can augment immediate response forces for direct support to a strike group operation or provide theater mission support in advance of approaching forces.

(3) **Follow-On Force.** Follow-on forces are MCM forces that are time-phased to arrive in theater after combat operations commence. Follow-on forces execute large-scale MCM operations to expand the operational area initially cleared by rapid response forces and conduct post-hostility mine clearance. These forces include CONUS-based AMCM and EOD forces not employed in the rapid response force and CONUS-based SMCM ships, which can self-deploy or be heavy-lifted into theater.

d. **US MCM Assets.** This section describes resources of the current USN MCM triad of forces, consisting of AMCM, SMCM, and UMCM systems and platforms. In most MCM operations, the US approach is to employ the triad working in concert. Each functional component of the triad offers complementary capabilities in MCM. The following paragraphs briefly describe US systems and platforms in service.

(1) **AMCM.** This section describes the general capabilities of AMCM helicopters and their systems. Additional information on AMCM functions and capabilities are contained in NTTP 3-15.22, *Airborne Mine Countermeasures Operations*. The AMCM force consists of two squadrons of MH-53E helicopters, HM-14 and HM-15, and the AMCM Weapon Systems Training School. The operational squadrons are organized and trained for rapid deployment and can be largely self-sustaining when operating in detachments from a large deck amphibious warfare ship or a shore site. Principal capabilities of the aircraft include sonar minehunting/bottom mapping, with laser bottom mine identification; mechanical minesweeping; influence minesweeping; precision navigation; and environmental reconnaissance. Typically, AMCM helicopters can carry and employ one MCM system at a time. The decision on which system to employ must be made well before the mission in order to configure the aircraft before flight.

(a) **MH-53E Helicopter.** The AMCM helicopter is the MH-53E Sea Dragon, a three-engine heavy-lift helicopter. Discussion of maximum and operational lift

limitations can be found in Naval Air Training and Operating Procedures Standardization Flight Manual A1-H53ME-NFM-000, *Navy Model MH-53E Helicopters.* The aircraft can fly for approximately four hours, assuming that environmental conditions do not restrict full-capacity fueling. More specific discussion of endurance and other limitations can also be found in Naval Air Training and Operating Procedures Standardization flight manuals.

(b) **AMCM Systems.** The major equipment used by the current AMCM systems includes mechanical and influence (acoustic, magnetic, and combination) minesweeping equipment and minehunting sonar. The systems are modular to permit installation and removal.

(2) **SMCM.** The surface element of the MCM triad is the Avenger Class, which has the capability to hunt and sweep moored and bottom mines. Avenger Class vessels have minehunting and neutralization capabilities, and can conduct mechanical, influence, and combination minesweeping. Their hulls are constructed of wood with a laminated glass reinforced plastic outer shell to reduce magnetic signature. Propulsion is primarily diesel engines driving twin shafts, with backup electric light load propulsion motors powered by a marine minesweeping gas turbine generator for reduced acoustic signature. The gas turbine generator can also power a bow thruster, for station-keeping and low-speed maneuvering, or the magnetic influence sweeping equipment. These vessels participate in coordinated operations with amphibious and other supported forces, conduct independent operations, and participate in integrated MCM operations. While these vessels can operate for extended periods of time, their transit speed is slow, and therefore they are unable to deploy rapidly in support of contingency operations. They are often deployed by heavy-lift shipping, and availability of such assets must be considered. Some Avenger Class ships are permanently forward deployed to alleviate this circumstance. MCM equipment used aboard the Avenger Class includes mechanical and influence (acoustic, magnetic, and combination) minesweeping gear, a hull-mounted variable depth high-frequency sonar, and a tethered pilotable minehunting unmanned underwater vessel (UUV) capable of identifying and neutralizing naval mines. Additional information on SMCM functions and capabilities is contained in NTTP 3-15.21, *Surface Mine Countermeasures (SMCM) Operations*. Principal SMCM operational capabilities are:

(a) Minehunting sonar.

(b) Remotely operated vehicle mine neutralization.

(c) Mechanical moored minesweeping.

(d) Influence minesweeping.

(e) Combination sweeping (mechanical-acoustic and magnetic-acoustic).

(f) Support of EOD operations to neutralize, destroy, and exploit mines.

(g) Magnetic silencing.

(h) Precision navigation.

(i) Environmental measuring.

(j) Buoying equipment.

(k) Nonferrous design throughout to reduce magnetic signature.

(l) Propulsion designed to reduce acoustic signature.

(3) **UMCM.** This section describes the general capabilities of UMCM assets and their systems. Additional information on UMCM functions and capabilities is contained in NTTP 3-15.23, *Underwater Mine Countermeasures (UMCM)*.

(a) **EOD MCM PLTs.** EOD MCM PLTs operate in conjunction with SMCM and AMCM units to reacquire, identify, neutralize, recover, and dispose of sea mines in the SW and VSW regions. They may deploy as part of an amphibious force and are vital in supporting amphibious operations. EOD MCM PLTs are designed to be deployable on short notice and can sustain operations without major resupply for approximately 30 days. They have diving and hand-held sonar equipment employable to a working depth of 200 feet and a maximum depth of 300 feet, but generally do not operate in the VSW region up to the SZ; that mission is assigned to the VSW TU as discussed in paragraph 4d(3)(c), "VSW TU." The primary mission of these detachments is to provide the MCMC with the capability to relocate, neutralize, counter, and exploit mines. Additionally, they can neutralize and countermine drifting and floating mines and are capable of prosecuting minelike contacts (MILCOs). They use specialized underwater breathing apparatus, recompression equipment, and technology to extend their working times, but are limited to operating in currents of one knot or less in sea state 3 or less, and their operating times may be further reduced by temperature extremes. EOD MCM PLTs are compatible with and complement the other members of the MCM triad, SMCM and AMCM. Specifically:

1. **AMCM and EOD.** EOD assets can be used in conjunction with AMCM to reacquire and prosecute contacts that have been located by helicopter using the Global Positioning System and selected segments of sonar imagery that are analyzed relative to the MILCO, or to dispose of mines released from their moorings by mechanical sweeping.

2. **SMCM and EOD.** EOD forces should be embarked aboard SMCM ships whenever minehunting is ongoing. This enables the prosecution of contacts using divers only or divers and unmanned neutralization vehicles. They can also deploy from a platform of opportunity, such as an amphibious warfare ship, to allow the SMCM units to continue operations while EOD assets prosecute MILCOs.

3. **Marine Mammal System (MMS) and EOD.** When used in concert with a MMS, EOD forces can identify marked contacts, neutralize previously marked contacts, conduct verification dives, or exploit a previously neutralized contact.

4. **UUVs and EOD.** EOD assets can be used to reacquire, identify, and neutralize UUV contacts using the Global Positioning System and selected segments of sonar imagery.

(b) **EOD Mobile PLTs.** EOD mobile PLTs are trained and equipped to perform the same missions as an MCM PLT, with the exception of mine recovery and field exploitation. Though possessing a smaller capacity for MCM operations, and operationally focused on other EOD missions, these units are referred to as possessing a "limited" MCM capability, and are a valuable force multiplier for operational commanders. For example, EOD mobile PLTs embarked in carrier strike groups provide the battle group's primary drifting mine neutralization capability.

(c) **VSW TU.** The VSW TU mission is to execute MCM in the VSW/SW region to the seaward edge of the SZ (normally the 10-foot depth contour). VSW TU assets conduct low-visible exploratory and reconnaissance operations to locate and prepare sea mines and obstacles for neutralization in support of amphibious operations and are also capable of providing the MCMC with an accurate and timely hydrographic reconnaissance report. Such missions are carried out in support of the amphibious task force commander to help prepare the operational area, but the unit's capabilities are also vital to the amphibious task force and LF commanders in executing the landing plan. The unit is capable of detecting, classifying, identifying, and neutralizing mines while assisting in opening assault lanes for landing craft and amphibious vehicles. Stages of VSW TU operations in support of amphibious operations include reconnaissance of possible landing sites, establishing a navigational grid, and swimming predetermined search patterns to detect, locate, classify, and map obstacles and mines. The team may also conduct clearance operations. Specific VSW TU capabilities include:

1. Locating, marking, and mapping mines in the VSW and SW region.

2. Assisting in lane selection.

3. Clearing mines within VSW and SW seaward approaches to amphibious landing beaches.

4. Precise navigation, obstacle location, doctrinal bottom type classification, and bottom mapping.

(d) The VSW TU is comprised of EOD divers, Marine Corps reconnaissance specialists, fleet technicians and divers organized into four operational PLTs: unmanned systems PLT, dive PLT, MMS PLT, and combatant craft PLT.

1. **Unmanned Systems PLT.** The UUV team uses the Mk 18 Mod 1 UUV to search for and map underwater objects in the VSW and SW regions with its onboard side-scan sonar. The Mk 18 Mod 1 can perform reconnaissance via hydrographic and side-scan sonar surveys from the seaward edge of the SZ to the deep water region. The vehicle is small, capable of deployment by two people, simple to program, and can be launched and recovered from a small vessel or boat without a crane or special handling equipment. Mk 18 Mod 1 can operate for over 20 hours on battery power before recharging

and is capable of speeds over 2.5m per second. It is programmed using a laptop computer, and can employ sound-emitting transponders as navigational reference beacons, or its onboard computer can autonomously select another more appropriate navigation method to use. Mk 18 Mod 1 missions are preprogrammed and the vehicle runs a predetermined track. Acoustic signaling equipment can be used to recall UUVs. UUV operators perform classification of sonar images during post mission analysis. Mk 18 Mod 1 was used successfully during Operation IRAQI FREEDOM as it was sent out to perform wide area surveys. MMS were then used to inspect potential targets located by Mk 18 Mod 1, and EOD PLTs followed up with demolition tasks. The unmanned aerial vehicle team uses the radio-controlled, man-portable *Silver Fox* and *Manta* unmanned aerial vehicles to provide real-time, low-observable intelligence surveillance and reconnaissance as well as adversary and friendly laydown situational awareness via electro-optical and infrared video during all phases of the VSW/SW missions. They can be launched from a forward operating base or various small insertion craft, and recovered via in-water landing. The aircraft are capable of fully autonomous flight and are able to carry various payloads to enhance mission effectiveness and adaptability.

2. **VSW Dive PLTs.** The dive PLT is comprised of three elements, each with 14 combat divers and an officer in charge. Divers operate in pairs with a *Viper* underwater breathing apparatus and an integrated navigation sonar system. Diver missions may last as long as three hours, and divers are capable of conducting exploratory, reconnaissance, and clearance operations. Although divers are a slow asset for clandestine reconnaissance and exploration, they provide the best mine identification and verification available and are well-suited for reacquisition, identification, and clearance. As with all divers, environmental limitations associated with extreme cold or hot water should be taken into account during planning.

3. **MMS PLTs.** Dolphins possess natural sonar ability, and, with proper training and care, can readily discriminate between MILCOs and non-MILCOs and can be reliably used to detect, mark, or neutralize mines or MILCOs. All three MMSs can carry out day or night operations and can be airlifted to a forward operating base or deployed on a naval vessel with a well-deck capability. In support of amphibious operations the dolphins can hunt mines from over the horizon into the operational area to clear boat lanes, and locate and mark mines for neutralization. The three MMSs assigned for use by the VSW TU are dolphins that are identified by system numbers.

a. Mk 4. Dolphins trained to detect, mark, and/or neutralize moored mines. An animal handler on the surface controls the dolphin from a small boat.

b. Mk 7. Dolphins trained to detect, mark, and/or neutralize bottom mines. The Mk 7 Mod 0 version MMS detects bottom mines proud of the bottom, and the Mk 7 Mod 1 version MMS detects bottom mines both proud of the bottom and buried. An animal handler on the surface controls the dolphin from a small boat.

c. Mk 8. Dolphins trained to detect and mark bottom mines. The animal handler on the surface operates out of a low-visible craft that offers a greater degree of concealment than other small boats.

4. **Combatant Craft PLT.** The combatant craft PLT employs the 11-meter Zodiac to insert and extract VSW TU PLTs. A typical deployment will include four 11-meter rigid hull inflatable boats, trailers, and two maintenance integrated services units.

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# APPENDIX C
## HUMANITARIAN MINE ACTION

*"I think we do agree on one central goal, and that is the need to end the threat that land mines 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. HDM assistance is the detection and clearance of land mines and other ERW, including activities related to the furnishing of education, training, and technical assistance with respect to the detection and clearance of land mines and other ERW. The Department of Defense (DOD) HDM assistance is authorized by Title 10, United States Code (USC), Section 407. The USG HMA program assists countries in relieving the suffering from the adverse effects of uncleared land mines and other ERW while promoting US interests. The DOD HMA program assists nations plagued by land mines and ERW by executing train-the-trainer programs of instruction designed to develop indigenous capabilities for a wide range of HMA activities.

2. The USG Policy Coordination Committee for Democracy, Human Rights, and International Operations Subgroup on HMA approves support for PNs. The DOD representative to this interagency Policy Coordination Committee for Democracy, Human Rights, and International Operations Subgroup on HMA is the Chief, HMA (Assistant Secretary of Defense [Special Operations and Low-Intensity Conflict]). DOD HDM assistance is a critical component of the overall USG mine action program.

3. HMA activities are a legitimate training opportunity for US military units that have demining tasks on their mission-essential task list. The operational requirements for deployment of US military personnel in support of HMA activities are identical to the deployment process for other similar training operations. The training requirements on a unit's mission-essential task list for wartime training and deployments may be met during HMA training. HMA training activities are also a key security cooperation tool available to a CCDR to gain training and other engagement opportunities in a specific country. Specifically, HMA activities can improve DOD visibility in the context of providing assistance to address a humanitarian need, build the capacity of the PN government, reduce or eliminate ERW, and build relationships with the PN government and its populace that can improve DOD access within a PN and/or region. DOD HMA activities typically include training PNs in the procedures of land mine clearance, mine risk education, and victims' assistance.

4. US forces carry out HDM assistance when the assistance promotes either the security interests of both the US and HN or the specific operational readiness skills of the members of the armed forces who participate in the activities. HDM assistance must be approved by the Department of State (DOS) and shall complement, and may not duplicate,

any other form of social or economic assistance that may be provided to the country concerned by other USG departments or agencies.

5. By law, DOD personnel are restricted in the extent to which they may actively participate in ERW clearance and physical security and stockpile management operations during HCA. Under Title 10, USC, Section 401(a)(1), Military Departments may carry out certain HCA activities in conjunction with authorized military operations of the armed forces in a foreign nation. Title 10, USC, Section 407(e)(1), defines the term HDM assistance (as part of HCA activities) as detection and clearance of land mines and other ERW, and includes the activities related to the furnishing of education, training, and technical assistance with respect to explosive safety, the detection and clearance of land mines and other ERW, and the disposal, demilitarization, physical security, and stockpile management of potentially dangerous stockpiles of explosive ordnance. However, under Title 10, USC, Section 407(a)(3), members of the US Armed Forces while providing HDM assistance shall not engage in the physical detection, lifting, or destroying of land mines or other ERW, or stockpiled conventional munitions (unless the member does so for the concurrent purpose of supporting a US military operation). Additionally, members of the US Armed Forces shall not provide such HDM and civic assistance as part of a military operation that does not involve the armed forces. Under DOD policy, the restrictions in Title 10, USC, Section 407, also apply to DOD civilian personnel.

6. A country experiencing the adverse effects of uncleared ERW may request US assistance. The country must formally request help from DOS through the US embassy. The country team provides a copy of the request to the pertinent GCC. Defense Security Cooperation Agency (DSCA) assists the CJCS, US Special Operations Command, GCCs, host countries, and other organizations in planning for, establishing, and executing mine action programs.

7. All requests for DOD HMA training and activities, including testing of new demining technology in foreign countries, will be vetted through Chief, HMA (Assistant Secretary of Defense [Special Operations and Low-Intensity Conflict]). This office will conduct all interagency coordination as required.

8. DOD HMA activities are funded from the Overseas Humanitarian, Disaster, and Civic Aid (DSCA) appropriation. The combatant commands may purchase limited demining equipment and supplies necessary for the conduct of the trainer program and transfer the equipment to the PN or designated agent upon completion of the DOD training program.

*Further information may be obtained from the Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3207.01,* Military Support to Humanitarian Mine Actions; *DOD Humanitarian Demining Research and Development homepage: http://www.humanitariandemining.org; and the United Nations Electronic Mine Information Network: http://www.mineaction.org.*

# APPENDIX D
## REFERENCES

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

### 1. Public Laws

a. Title 10, USC.

b. Title 14, USC.

### 2. Strategic Guidance and Policy

a. National Military Strategy of the United States of America.

b. Memorandum of Agreement Between the Department of Defense and the Department of Homeland Security on the Use of the US Coast Guard Capabilities and Resources in Support of the National Military Strategy.

c. PPD-37, *US Landmine Policy.*

### 3. Chairman of the Joint Chiefs of Staff Publications

a. CJCSI 3121.01B, *Standing Rules of Engagement/Standing Rules for the Use of Force for US Forces.*

b. CJCSI 3150.25E, *Joint Lessons Learned Program.*

c. CJCSI 3207.01C, *Department of Defense Support to Humanitarian Mine Action.*

d. CJCS Manual 3130.03, *Adaptive Planning and Execution (APEX) Planning Formats and Guidance.*

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

f. JP 2-0, *Joint Intelligence.*

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

h. JP 2-03, *Geospatial Intelligence in Joint Operations.*

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

j. JP 3-02, *Amphibious Operations.*

k. JP 3-06, *Joint Urban Operations.*

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

m. JP 3-15.1, *Counter-Improvised Explosive Device Operations.*

n. JP 3-18, *Joint Forcible Entry Operations.*

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

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

## 4. Multi-Service Publications

a. ATTP 3-90.4/MCWP 3-17.8, *Combined Arms Mobility Operations.*

b. ATTP 4-32.2/MCRP 3-17.2B/NTTP 3-02.4.1/AFTTP 3-2.12, *Multi-Service Tactics, Techniques, and Procedures for Unexploded Ordnance.*

c. ATTP 4-32.16/MCRP 3-17.2C/NTTP 3-02.5/AFTTP 3-2.32, *Multi-Service Tactics, Techniques, and Procedures for Explosive Ordnance Disposal.*

d. FM 3-34.170/MCWP 3-17.4, *Engineer Reconnaissance*.

e. FM 3-34.210/MCRP 3-17.2D, *Explosive Hazards Operations*.

f. FM 3-34-214/MCRP 3-17.7L, *Explosives and Demolitions*.

g. FM 4-30.51/MCRP 3-17.2A, *Unexploded Ordnance (UXO) Procedures.*

h. MCRP 3-31.2A/NTTP 3-15.24, *Mine Countermeasures in Support of Amphibious Operations.*

i. MCWP 3-31.2/NWP 3-15, *Naval Mine Warfare*, Volume I.

j. MCWP 5-12.1/NWP 1-14M, Commandant of the Coast Guard Publication P5800.7A, *The Commander's Handbook on the Law of Naval Operations*.

k. NTTP 3-02.1/MCWP 3-31.5, *Ship-to-Shore Movement*.

l. Army Techniques Publication 3-37.34/MCWP 3-17.6, *Survivability Operations*.

m. Army Techniques Publication 3-90.8/MCWP 3-17.5, *Combined Arms Countermobility Operations*.

## 5. United States Army Publications

a. ATTP 3-06.11, *Combined Arms Operations in Urban Terrain.*

b. FM 3-34, *Engineer Operations.*

c. FM 3-90.6, *Brigade Combat Team.*

d. FM 3-90.61, *Brigade Special Troops Battalion.*

e. FM 3-90.119, *Combined Arms Improvised Explosive Device Defeat Operations.*

f. FM 6-99, *US Army Report and Message Formats.*

g. Army Techniques Publication 3-34.22, *Engineer Operations—Brigade Combat Team and Below.*

## 6. United States Navy Publications

a. NTTP 3-15.1, *Maritime Mining*.

b. NTTP 3-15.21, *Surface Mine Countermeasures (SMCM) Operations.*

c. NTTP 3-15.22, *Airborne Mine Countermeasures Operations.*

d. NTTP 3-15.23, *Underwater Mine Countermeasures (UMCM).*

e. NWP 3-02.4, *Explosive Ordnance Disposal.*

f. NWP 3-05, *Naval Special Warfare.*

g. NWP 3-15, *Naval Mine Warfare.*

h. NWP 4-12, *Navy Salvage Operations.*

i. Naval Air Training and Operating Procedures Standardization Flight Manual A1-H53ME-NFM-000, *Navy Model MH-53E Helicopters.*

## 7. United States Marine Corps Publications

a. MCWP 3-17, *Engineering Operations.*

b. MCWP 3-17.2, *MAGTF Explosive Ordnance Disposal.*

## 8. Other Publications

a. Allied Tactical Publication (ATP)-1 (C), Vol. I, *Allied Maritime Tactical Instructions*.

b. ATP-1 (C), Vol. II, *Allied Maritime Tactical Instructions and Procedures.*

c. ATP-6C (Navy) (Air), Volume I, *Allied Doctrine of Mine Warfare, Policies, and Principles.*

d. ATP-24 (C) (Navy), *Tactical Instructions and Procedures for the Conduct of Mine Warfare Operations.*

e. Standardization Agreement (STANAG) 2036, *Land Minefield Laying, Marking, Recording, and Reporting Procedures.*

f. STANAG 2430, *Land Force Combat Engineer Messages, Reports, and Returns (AEngrP-2).*

g. STANAG 2485, *Countermine Operations in Land Warfare.*

h. TC 20-32-3, *Foreign Mine Handbook (Balkan States).*

i. TC 20-32-4, *Foreign Mine Handbook (Asia).*

j. TC 20-32-5, *Commander's Reference Guide: Land Mine and Explosive Hazards (Iraq).*

k. Allied Procedural Publication-4, *Allied Formatted and Standard Messages.*

l. Maritime Tactical Publication-6(c) Volume I, *Naval Mine Warfare Principles*.

m. Maritime Tactical Publication-6(c) Volume II, *Naval Mine Countermeasures Operations Planning and Evaluation.*

n. Maritime Tactical Publication-24(c) Volume I, *Naval Mine-Countermeasures Tactics and Execution*.

o. 1980 United Nations Convention on Conventional Weapons, especially Protocol II and IV.

p. 1997 Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and their Destruction.

q. Variable Message Format Message Number K05.16, *Land Minefield Laying Report*, TIDP-TE, Vol. III, Annex A.

# APPENDIX E
## ADMINISTRATIVE INSTRUCTIONS

### 1. User Comments

Users in the field are highly encouraged to submit comments on this publication to: Joint Staff J-7, Deputy Director, Joint Education and Doctrine, ATTN: Joint Doctrine Analysis Division, 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, *Barriers, Obstacles, and Mine Warfare for Joint Operations*, 17 June 2011.

### 4. Change Recommendations

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

TO: Deputy Director, Joint Education and Doctrine (DD JED), Attn: Joint Doctrine Division, 7000 Joint Staff (J-7), Washington, DC, 20318-7000 or email:js.pentagon.j7.list.dd-je-d-jdd-all@mail.mil.

b. Routine changes should be submitted electronically to the Deputy Director, Joint Education and Doctrine, ATTN: Joint Doctrine Analysis Division, 116 Lake View Parkway, Suffolk, VA 23435-2697, and info the lead agent and the Director for Joint Force Development, J-7/JED.

c. When a Joint Staff directorate submits a proposal to the CJCS 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 Services and other organizations are requested to notify the Joint Staff J-7 when changes to source documents reflected in this publication are initiated.

### 5. Lessons Learned

The Joint Lessons Learned Program (JLLP) primary objective is to enhance joint force readiness and effectiveness by contributing to improvements in doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy. The Joint Lessons Learned Information System (JLLIS) is the DOD system of record for lessons learned and facilitates the collection, tracking, management, sharing, collaborative resolution, and dissemination of lessons learned to improve the development and readiness

of the joint force. The JLLP integrates with joint doctrine through the joint doctrine development process by providing lessons and lessons learned derived from operations, events, and exercises. As these inputs are incorporated into joint doctrine, they become institutionalized for future use, a major goal of the JLLP. Lessons and lessons learned are routinely sought and incorporated into draft JPs throughout formal staffing of the development process. The JLLIS Website can be found at https://www.jllis.mil or http://www.jllis.smil.mil.

## 6. Distribution of Publications

Local reproduction is authorized, and access to unclassified publications is unrestricted. However, access to and reproduction authorization for classified JPs must be IAW DOD Manual 5200.01, Volume 1, *DOD Information Security Program: Overview, Classification, and Declassification,* and DOD Manual 5200.01, Volume 3, *DOD Information Security Program: Protection of Classified Information.*

## 7. Distribution of Electronic Publications

a. Joint Staff J-7 will not print copies of JPs for distribution. Electronic versions are available on JDEIS Joint Electronic Library Plus (JEL+) at https://jdeis.js.mil/jdeis/index.jsp (NIPRNET) and http://jdeis.js.smil.mil/jdeis/index.jsp (SIPRNET), and on the JEL at http://www.dtic.mil/doctrine (NIPRNET).

b. Only approved JPs are releasable outside the combatant commands, Services, and Joint Staff. Defense attachés may request classified JPs by sending written requests to Defense Intelligence Agency (DIA)/IE-3, 200 MacDill Blvd., Joint Base Anacostia-Bolling, Washington, DC 20340-5100.

c. JEL CD-ROM. Upon request of a joint doctrine development community member, the Joint Staff J-7 will produce and deliver one CD-ROM with current JPs. This JEL CD-ROM will be updated not less than semi-annually and when received can be locally reproduced for use within the combatant commands, Services, and CS agencies.

# GLOSSARY

## PART I — ABBREVIATIONS, ACRONYMS, AND INITIALISMS

| | |
|---|---|
| ABCT | armored brigade combat team |
| AFTTP | Air Force tactics, techniques, and procedures |
| AHD | antihandling device |
| AMC | Air Mobility Command |
| AMCM | airborne mine countermeasures |
| AOA | amphibious objective area |
| AP | antipersonnel |
| APL | antipersonnel land mine |
| ATP | allied tactical publication |
| ATTP | Army tactics, techniques, and procedures |
| AVL | anti-vehicle land mine |
| | |
| BCT | brigade combat team |
| BEB | brigade engineer battalion |
| | |
| C2 | command and control |
| CA | civil affairs |
| CATF | commander, amphibious task force |
| CBRN | chemical, biological, radiological, and nuclear |
| CCDR | combatant commander |
| CCW | 1980 United Nations Convention on Conventional Weapons |
| CEB | combat engineer battalion |
| CJCS | Chairman of the Joint Chiefs of Staff |
| CJCSI | Chairman of the Joint Chiefs of Staff instruction |
| CLF | commander, landing force |
| COA | course of action |
| COMUSPACFLT | Commander, United States Pacific Fleet |
| CONOPS | concept of operations |
| CONUS | continental United States |
| COP | common operational picture |
| CS | combat support |
| | |
| DOD | Department of Defense |
| DOS | Department of State |
| DSCA | Defense Security Cooperation Agency |
| | |
| EH | explosive hazard |
| EHCC | explosive hazards coordination cell |
| EOD | explosive ordnance disposal |
| ERT | engineer reconnaissance team |
| ERW | explosive remnants of war |
| ESB | engineer support battalion |

| | |
|---|---|
| FM | field manual (Army) |
| GCC | geographic combatant commander |
| GCE | ground combat element (MAGTF) |
| HCA | humanitarian and civic assistance |
| HDM | humanitarian demining |
| HMA | humanitarian mine action |
| HN | host nation |
| IBCT | infantry brigade combat team |
| IED | improvised explosive device |
| JFC | joint force commander |
| JFMCC | joint force maritime component commander |
| JIPOE | joint intelligence preparation of the operational environment |
| JP | joint publication |
| JPP | joint planning process |
| K-Kill | catastrophic kill |
| LCE | logistics combat element (MAGTF) |
| LF | landing force |
| LOC | line of communications |
| LZ | landing zone |
| MAGTF | Marine air-ground task force |
| MCM | mine countermeasures |
| MCMC | mine countermeasures commander |
| MCMREP | mine countermeasure report |
| MCMRON | mine countermeasures squadron |
| MCRP | Marine Corps reference publication |
| MCWP | Marine Corps warfighting publication |
| METT-T | mission, enemy, terrain and weather, troops and support available-time available |
| MILCO | minelike contact |
| MILDEC | military deception |
| MIW | mine warfare |
| MIWC | mine warfare commander |
| M-Kill | mobility kill |
| MMS | marine mammal system |
| MP | military police (Army and Marine) |
| MPSRON | maritime pre-positioning ships squadron |

| | |
|---|---|
| NCC | Navy component commander |
| NMC | Navy Munitions Command |
| NTTP | Navy tactics, techniques, and procedures |
| NWP | Navy warfare publication |
| OPLAN | operation plan |
| OPORD | operation order |
| OPTASK | operation task |
| PLT | platoon |
| PN | partner nation |
| PPD | Presidential policy directive |
| RCT | regimental combat team |
| ROE | rules of engagement |
| SBCT | Stryker brigade combat team |
| SecDef | Secretary of Defense |
| SLOC | sea line of communications |
| SMCM | surface mine countermeasures |
| SMWDC | Surface and Mine Warfighting Development Center |
| SPOTREP | spot report |
| STANAG | standardization agreement (NATO) |
| SW | shallow water |
| SZ | surf zone |
| TC | training circular |
| TTP | tactics, techniques, and procedures |
| TU | task unit |
| UMCM | underwater mine countermeasures |
| UN | United Nations |
| UNCLOS | United Nations Convention on the Law of the Sea |
| USAF | United States Air Force |
| USC | United States Code |
| USCG | United States Coast Guard |
| USFF | United States Fleet Forces Command |
| USG | United States Government |
| USN | United States Navy |
| UUV | unmanned underwater vessel |
| UXO | unexploded explosive ordnance |
| VSW | very shallow water |
| WBIED | waterborne improvised explosive device |

## PART II—TERMS AND DEFINITIONS

**anti-vehicle land mine.** A mine designed to immobilize or destroy a vehicle. Also called **AVL.** (JP 1-02. SOURCE: JP 3-15)

**arming.** As applied to explosives, weapons, and ammunition, the changing from a safe condition to a state of readiness for initiation. (JP 1-02. SOURCE: JP 3-15)

**barrier.** A coordinated series of natural or man-made 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. (JP 1-02. SOURCE: JP 3-15)

**barrier, obstacle, and mine warfare plan.** A comprehensive, coordinated plan that includes responsibilities; general location of unspecified and specific barriers, obstacles, and minefields; special instructions; limitations; coordination; and completion times; and may designate locations of obstacle zones or belts. (JP 1-02. SOURCE: JP 3-15)

**bottom mine.** A mine with negative buoyancy that remains on the seabed. (Approved for incorporation into JP 1-02.)

**canalize.** To restrict operations to a narrow zone by use of existing or reinforcing obstacles or by fire or bombing. (JP 1-02. SOURCE: JP 3-15)

**clearing operation.** An operation designed to clear or neutralize all mines and obstacles from a route or area. (JP 1-02. SOURCE: JP 3-15)

**contact mine.** A mine detonated by physical contact. (JP 1-02. SOURCE: JP 3-15)

**conventional mines.** None. (Approved for removal from JP 1-02.)

**defensive minefield.** 1. In naval mine warfare, a minefield laid in international waters or international straits with the declared intention of controlling shipping in defense of sea communications. 2. In land mine warfare, a minefield laid in accordance with an established plan to prevent a penetration between positions and to strengthen the defense of the positions themselves. (JP 1-02. SOURCE: JP 3-15)

**degaussing.** The process whereby a ship's magnetic field is reduced by the use of electromagnetic coils, permanent magnets, or other means. (JP 1-02. SOURCE: JP 3-15)

**denial measure.** An action to hinder or deny the enemy the use of territory, personnel, or facilities to include destruction, removal, contamination, or erection of obstructions. (JP 1-02. SOURCE: JP 3-15)

**exclusive economic zone.** A maritime zone adjacent to the territorial sea that may not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured. Also called **EEZ**. (JP 1-02. SOURCE: JP 3-15)

**explosive hazard.** Any material posing a potential threat that contains an explosive component such as unexploded explosive ordnance, booby traps, improvised explosive devices, captured enemy ammunition, and bulk explosives. Also called **EH.** (Approved for incorporation into JP 1-02.)

**flame field expedient.** Simple, handmade device used to produce flame or illumination. Also called **FFE.** (Approved for replacement of "flame field expedients" and its definition in JP 1-02.)

**hasty breach.** The creation of lanes through enemy minefields by expedient methods such as blasting with demolitions, pushing rollers or disabled vehicles through the minefields when the time factor does not permit detailed reconnaissance, deliberate breaching, or bypassing the obstacle. (JP 1-02. SOURCE: JP 3-15)

**humanitarian mine action.** Activities that strive to reduce the social, economic, and environmental impact of land mines, unexploded ordnance, and small arms ammunition. Also called **HMA.** (Approved for incorporation into JP 1-02.)

**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 1-02. SOURCE: JP 3-15)

**influence sweep.** A sweep designed to produce an influence similar to that produced by a ship and thus actuate mines. (JP 1-02. SOURCE: JP 3-15)

**magnetic mine.** A mine that responds to the magnetic field of a target. (JP 1-02. SOURCE: JP 3-15)

**mechanical sweep.** In naval mine warfare, any sweep used with the object of physically contacting the mine or its appendages. (JP 1-02. SOURCE: JP 3-15)

**mine.** 1. In land mine warfare, a munition placed under, on or near the ground or other surface area and designed to be exploded by the presence, proximity or contact of a person or vehicle. 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. (Approved for incorporation into JP 1-02.)

**mine countermeasures.** All methods for preventing or reducing damage or danger from mines. Also called **MCM.** (JP 1-02. SOURCE: 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 emplaced with or without a pattern. (JP 1-02. SOURCE: 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 emplacement operations. (JP 1-02. SOURCE: 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 1-02. SOURCE: JP 3-15)

**minehunting.** Employment of air, surface, or subsurface sensor and neutralization systems to locate and dispose of individual mines in a known field, or to verify the presence or absence of mines in a given area. (Approved for incorporation into JP 1-02.)

**minesweeping.** The technique of clearing mines using either mechanical sweeping to remove, disturb, or otherwise neutralize the mine; explosive sweeping to cause sympathetic detonations, damage, or displace the mine; or influence sweeping to produce either the acoustic or magnetic influence required to detonate the mine. (JP 1-02. SOURCE: JP 3-15)

**mine warfare.** The strategic, operational, and tactical use of mines and mine countermeasures either by emplacing mines to degrade the enemy's capabilities to wage land, air, and maritime warfare or by countering of enemy-emplaced mines to permit friendly maneuver or use of selected land or sea areas. Also called **MIW.** (Approved for incorporation into1-02.)

**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 1-02. SOURCE: JP 3-15)

**networked munitions.** Remotely controlled, interconnected, weapons systems designed to provide rapidly emplaced ground-based countermobility and protection capability through scalable application of lethal and nonlethal means. (Approved for incorporation into JP 1-02.)

**nonpersistent mine.** Mine that remains active for a predetermined period of time until self-destruction, self-neutralization, or self-deactivation renders the mine inactive. (Approved for inclusion in JP 1-02.)

**nuisance minefield.** A minefield laid to delay and disorganize the enemy and to hinder the use of an area or route. (JP 1-02. SOURCE: JP 3-15)

**obstacle.** Any natural or man-made 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. (JP 1-02. SOURCE: JP 3-15)

**obstacle belt.** A brigade-level command and control measure, normally depicted graphically, to show where within an obstacle zone the ground tactical commander plans to limit friendly obstacle employment and focus the defense. (Approved for incorporation into JP 1-02.)

**obstacle clearing.** The total elimination or neutralization of obstacles. (JP 1-02. SOURCE: JP 3-15)

**obstacle intelligence.** None. (Approved for removal from JP 1-02.)

**obstacle restricted areas.** A command and control measure used to limit the type or number of obstacles within an area. (JP 1-02. SOURCE: JP 3-15)

**obstacle zone.** A division-level command and control measure to designate specific land areas where lower echelons are allowed to employ tactical obstacles. (Approved for incorporation into JP 1-02.)

**operational control authority.** The naval commander responsible within a specified geographical area for the naval control of all merchant shipping under Allied naval control. Also called **OCA.** (JP 1-02. SOURCE: JP 3-15)

**ordnance.** Explosives, chemicals, pyrotechnics, and similar stores, e.g., bombs, guns and ammunition, flares, smoke, or napalm. (JP 1-02. SOURCE: JP 3-15)

**oscillating mine.** A hydrostatically controlled mine that maintains a pre-set depth below the surface of the water independent of the rise and fall of the tide. (Approved for incorporation into JP 1-02.)

**passive mine.** None. (Approved for removal from JP 1-02.)

**persistent mine.** A land mine, other than nuclear or chemical, that is not designed to self-destruct; is designed to be emplaced by hand or mechanical means; and can be buried or surface emplaced. (Approved for inclusion in JP 1-02.)

**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. (JP 1-02. SOURCE: 3-15)

**pressure mine.** 1. In land mine warfare, a mine having a fuze that responds to the direct pressure of a target. 2. In naval mine warfare, a mine having a circuit that responds to the hydrodynamic pressure field of a target. (Approved for incorporation into JP 1-02.)

**proof.** In mine warfare, to verify that a breached lane is free of live mines by passing a mine roller or other mine-resistant vehicle through as the lead vehicle. (Approved for incorporation into JP 1-02.)

**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 emplaced in friendly territorial waters to protect ports, harbors, anchorages, coasts, and coastal routes. (JP 1-02. SOURCE: 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 1-02. SOURCE: JP 3-15)

**recovery.** 1. In air (aviation) operations, that phase of a mission that involves the return of an aircraft to a land base or platform afloat. (JP 3-52) 2. The retrieval of a mine from the location where emplaced. (JP 3-15) 3. In personnel recovery, actions taken to physically gain custody of isolated personnel and return them to friendly control. (JP 3-50) 4. Actions taken to extricate damaged or disabled equipment for return to friendly control or repair at another location. (JP 1-02. SOURCE: JP 3-34)

**reduction.** The creation of lanes through a minefield or obstacle to allow passage of the attacking ground force. (JP 1-02. SOURCE: 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 1-02. SOURCE: 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 1-02. SOURCE: JP 3-15)

**rising mine.** In naval mine warfare, a mine having positive buoyancy, which is released from a sinker by a ship influence or by a timing device. (Approved for incorporation into JP 1-02.)

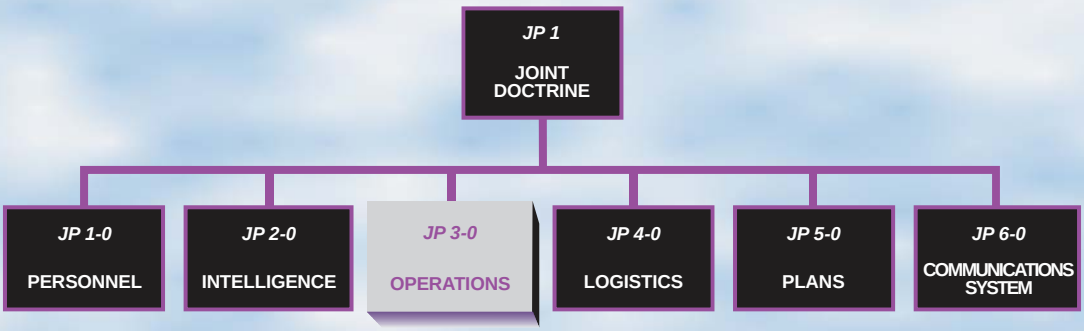
**sterilizer.** In mine warfare, a device included in mines to render the mine permanently inoperative on expiration of a pre-determined time after laying. (JP 1-02. SOURCE: JP 3-15)

**tactical minefield.** A minefield that is employed to directly attack enemy maneuver as part of a formation obstacle plan and is laid to delay, channel, or break up an enemy advance, giving the defending element a positional advantage over the attacker. (JP 1-02. SOURCE: JP 3-15)

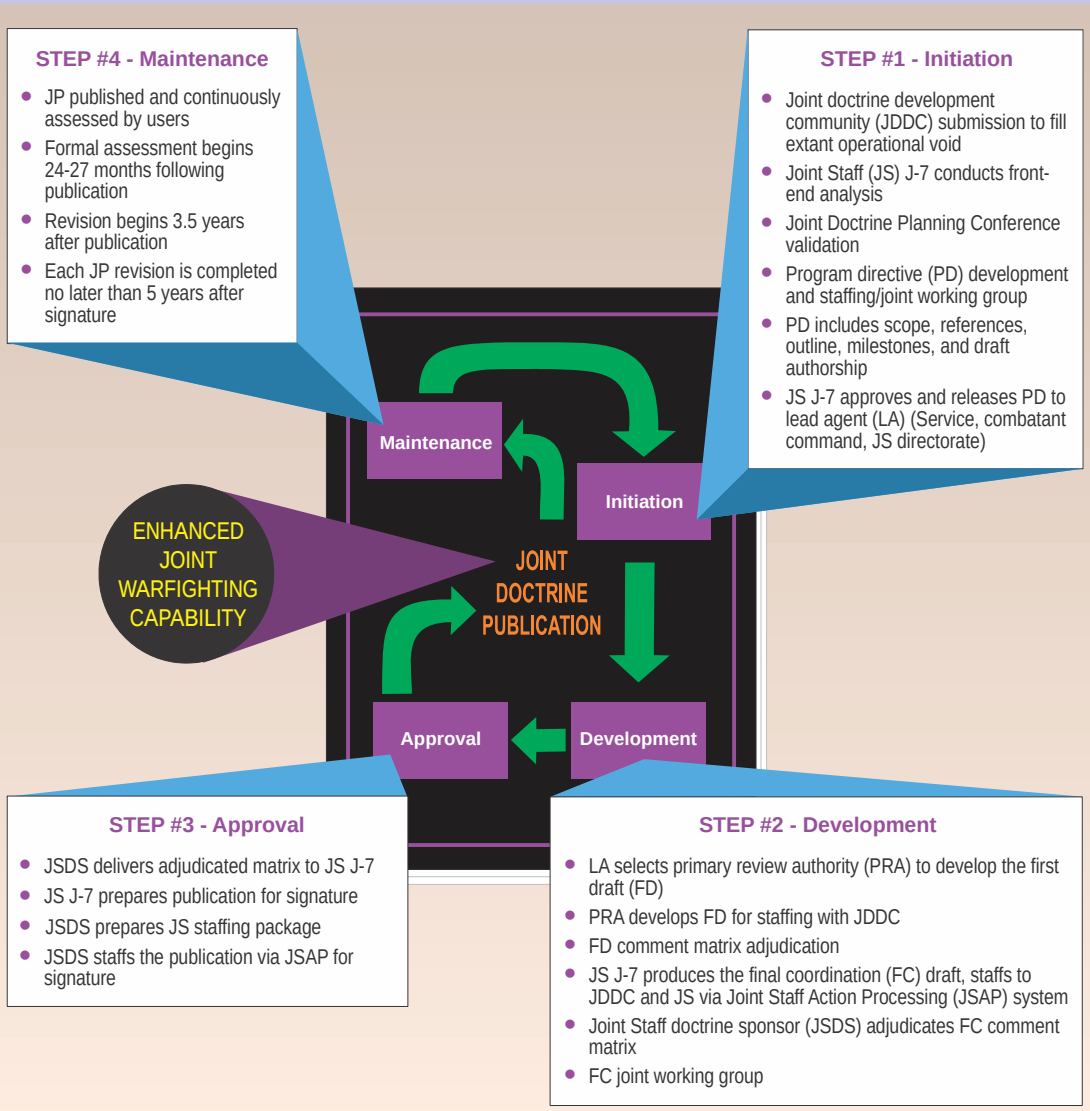
**tactical obstacle.** An obstacle employed to disrupt enemy formations, to turn them into a desired area, to fix them in position under direct and indirect fires, or to block enemy penetrations. (Approved for replacement of “tactical obstacles” and its definition in JP 1-02.)

**terrain intelligence.** None. (Approved for removal from JP 1-02.)

# 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:



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