

## **Appendix D**

### **Operations in Extreme Environments**

Section 1. Jungle Operations  
Section 2. Desert Operations  
Section 3. Mountain Operations  
Section 4. Operations in Deep Snow and Extreme Cold

## **General**

Tank employment in changing operational conditions and environments present special problems and situations. The planners consider the capabilities and limitations of tanks, the principles of tank employment, and the conditions of the special situation. Each special situation may require modification in tactics and augmentation in equipment. For detailed discussions on operating tanks in varying conditions and situations refer to TM 5950-264-10 tank operations manuals.

## **Section 1. Jungle operations**

MCWP 3-35.5 Jungle Operations addresses jungle operations in depth. Jungle combat involves operations with such impediments as swamps, undulating terrain, extreme heat, heavy rains and areas largely overgrown with thick tropical foliage. The conduct of combat operations in jungles requires a high degree of leadership and individual initiative to meet the problems imposed by climatic conditions, topography, and vegetation. The degree to which Marines are acclimated and are trained to live and fight in the jungle will contribute to a unit's success or failure. The basics of successful jungle operations are: decentralized control, flexibility, security, and intelligence.

The restrictive nature of the jungle environment impedes typical tank operations. Cover and concealment are excellent in this type of terrain and increase the possibility of achieving surprise. As a result both the attacker and the defender usually commit large portions of available forces to security missions. Key jungle terrain features include trails, navigable rivers, high ground, and existing commercial centers; none of which are considered optimal terrain for tank operations.

In the offense, security elements prevent surprise and protect the MAGTF. In jungles successful security force operations depend on proper implementation of security elements. Units find their direction of movement hard to maintain without navigation aids such global positioning system receivers. The thick foliage and rugged terrain of most jungles limit fields of fire ground movement speed, and the range of combat net radios and automated command information systems. Restrictions on observation and fields of fire may reduce the capabilities of tanks to acquire targets and deliver accurate direct fires. Additionally, the difficulties associated with jungle operations increase in proportion to the size of the force involved. These limitations drive the conduct of operations to the company, platoon and individual tank crew level.

The critical aspect of a defensive operation in a jungle environment is the security of the line of communications sustaining the MAGTF. To guard against surprise, the defending commander organizes his forces in depth. He secures or provides alternative routes around choke points and provides for the security of resupply convoys. He also ensures the all-around defense of units and installations operating in jungles and installations. The commander establishes a mobile reserve to counter unanticipated enemy actions. To

block enemy penetrations of his defensive perimeter, to counterattack, or to pursue a detected enemy.

Consideration for jungle operation include:

- The dense foliage and weather alter the effective ranges of weapon systems.
- Units must allow for slower movement and restricted fire support in their plans. The limited visibility common to jungles may make the observation and adjustment of indirect fires difficult.
- Heat, thick vegetation, and rugged terrain will tire Marines rapidly.
- Lack of roads will hinder resupply and evacuation in the absence of helicopter support.

## **Section 2. Desert Operations**

Desert terrain varies considerable from place to place. Certain environmental characteristics such as extreme temperature ranges, lack of water, absence of vegetation, and dust /sandstorms are common to all deserts, and their adverse effect must be considered during planning. Highly mobile forces play a dominant role in operations in desert regions. Properly employed and maintained, the tank can be the most decisive supporting arm available to the MAGTF commander during desert operations. Tanks provide the freedom of maneuver in the vastness of these regions that favor a fluid type of warfare characterized by dispersed formations on extended frontages with considerable depth.

Desert topography may consist of loose sand and sand dunes that greatly impede the movement of vehicles; or it may have a hard surface that facilitates large mechanized formations. Successful desert operations require adaptation to the environment and to the limitations of its terrain and climate. Units must modify and adapt their equipment and tactics to a dusty and rugged landscape. MCWP 3-35.6 Desert Operations is the Marine Corps' primary reference on this subject.

Desert offensive operations tend to favor wide envelopments, fast and wide flanking movements by armored formations because of the freedom of maneuver. Because of the limited concealment offered by the bare terrain, units must attain surprise by use of deception, appropriate security measures, and rapid movement. Commanders exploit periods of limited visibility. Objectives may include enemy units, communications centers, supply bases, water sources, and key terrain features.

Defensive operations in these regions emphasize mobility and flexibility. Commanders should make provisions for long-range direct fire weapons, construction of extensive obstacle systems to canalize or slow the enemy, a high degree of mobility, and secure communications. The organization of the defense should emphasize measures against both air and armored attack.

The following additional considerations are necessary when planning tactical operations:

- Mobility is key to successful operations. Movement may be easily detected however, due to sand and dust signatures, reflections from equipment and minimal concealment.
- Long-range direct fire capability makes the tank an ideal weapon in desert terrain. The long-range fields of fire common to desert areas tend to allow all weapons systems to engage at their maximum range. These same extended engagement ranges hinder positive target identification.
- Dust is an observational, control and maintenance hazard to a maneuvering force.
- Land navigation may be difficult in the absence of navigation aids and current maps due to changing terrain features and minimal key landmarks.

### **Section 3. Mountain operations**

Rugged, compartmented terrain with steep slopes and few natural or man made lines of communications generally characterized military-significant mountains. The compartmented terrain causes a corresponding compartmentalization of military operations. Mountain operations require special equipment, training, acclimatization of personnel to altitude conditions, and self-discipline to succeed. The mountain environment, with its effects on personnel and equipment, requires some modifications of standard tactics and procedures. MCWP 3-35.2 Mountain Operations is the primary doctrinal reference for these operations.

The focal point of mountain operations is to control the heights. Key terrain features normally include those heights that dominate lines of communications, mountain passes, roads, bridges and railroads. Fighting from higher ground gives the possessor distinct tactical advantages.

Control of dominating terrain protecting road nets or passes normally is the key to the organization of a defense in mountainous areas. Units must secure their flanks, any neighboring defiles, road nets, support areas, and tactical operations centers from infiltration and attack. Units require security forces, particularly observation posts and patrols, to prevent surprise.

Inherent in mountain operations are the difficulties that the terrain offers to movement. Operations in mountainous regions take longer than normal to plan and execute. Key mountain operational basics include:

- Communication and sustainment are increasing difficult to execute in rugged terrain. In general, operations in mountainous terrain retard and restrict maneuver, and make communications and resupply of tanks difficult.
- Defenses may have to locate on the military crest to fire into an engagement area. Mountain terrain can be either a dangerous obstacle to operations or a valuable aid, according to how well it is understood and to what extent the tank commander takes advantage of its peculiar characteristics.

- Night and periods of limited visibility are the best movement times due to the extended range of observation from enemy positions. Movement times are slower due to terrain and altitude effects. Any differences in elevation over the march route also have an impact on unit movement times.
- The terrain reduces the effectiveness of firepower.
- Centralized planning and decentralized small unit execution characterize operations because the terrain limits the commander's capability to directly control operations.

#### **Section 4. Operations in Deep Snow and Extreme Cold**

Deep snow and extreme cold weather present employment problems in operations involving tanks. This in turn increases engineer support requirements and may require the extensive use of airlines of communication. Combat operations in deep snow or extreme cold weather present two opponents: the enemy, who must be defeated, and nature, who must be made an ally. Planning and training can reduce the effect of the climatic conditions, but commanders and staffs must understand the penalties that these severe conditions impose on operations. Aggressive leadership and special training minimize many of the effects of cold weather operations. Many of the missions assigned to tanks are the same as those assigned in normal operation, and the tactics and techniques employed in offensive and defensive operations are similar. MCWP 3-35.1 Cold Weather Operations is the primary doctrinal publication on fighting in this environment.

Tactical employment is modified to offset the characteristics of the area and its weather. When planning tactical operations for execution during rigorous winter weather, commanders must carefully consider the probable effects of weather upon operations, the health of Marines, supply, evacuation, and the maintenance of lines of communication. Ice, deep snow and extreme cold weather modify the normal use of terrain features. Planning considerations during operations in snow or extreme cold weather include:

- Operations take longer than normal to plan and execute.
- The impact of cold on manpower.
- The impact of cold on weapons.
- The impact of cold and deep snows on mobility.
- Concealment and camouflage. Increased requirements for combat service support.