Chapter 10: Engineer Support

This page is a section of FM 7-100.1 Opposing Forces Operations.

The OPFOR believes success in battle requires extensive engineer support at every level. Engineer plans at the operational level support the various strategic-level courses of action involved in the Stateâ s strategic campaign. Engineers facilitate the mobility and high rate of movement of combined arms forces while enhancing the survivability of forces. Although the OPFOR generally conducts engineer countermobility activities at the tactical level, it also maximizes activities conducted at the operational level to disaggregate, disrupt, delay, block, or canalize enemy forces. See FM 7-100.2 for more information on tactical-level engineer actions.

Assets

Military engineers fall into two basic categories: combat engineers and special-category engineers.Â Combat engineers are thoseÂ whoseÂ tasksÂ may bring them in direct contact with the enemy. Special-category engineers (such as bridge- and road-building units) do not normally engage the enemy and generally use utility vehicles as their primary transportation rather than engineer vehicles designed to survive close combat. Together, these two categories of engineers are responsible for the more difficult and complex engineering tasks. Their missions require specialized training and the use of special equipment or munitions. Often the distinction of engineer categories is blurred somewhat depending on task organizations and their mission-driven employment.

At the operational level, the OPFOR plans the complete integration of civilian and military engineer resources. For example, maneuver commanders may use civilian earthmoving, road-building, and construction equipment and personnel, especially in support zones. This allows constituent combat engineer equipment and personnel to accompany maneuver forces in battle. Civilian workers or maneuver units can perform many basic combat engineer tasks, with engineers providing guidance and technical expertise.

Command and Control

Engineer units allocated to an operational-strategic command (OSC) in constituent or dedicated relationships may be directly under the command of the OSC commander. The OSC commander or his subordinate commanders can controlâ but do not commandâ other engineer assets that are allocated to them in a supporting relationship. Rather than keeping all allocated engineer assets under his direct command and control (C2), the OSC commander may suballocate some engineer units to his subordinate maneuver units or to his integrated fires command (IFC) and/or integrated support command (ISC).

Staff Responsibility

Various staff elements under the operations officer advise him on engineer matters and allow him to advise the commander on the employment of engineer assets. The chief of force protection and the chief of infrastructure management receive liaison teams from each constituent, dedicated, or supporting engineer unit. These teams provide the staff with detailed expertise on engineer functions and provide a direct communications conduit to the engineer units executing such functions. Based on the advice of the liaison teams and coordination with the engineer units through the respective liaison teams, these functional staff chiefs advise the commander on engineer employment within their functional areas. Other liaison teams may fall under the chief of current operations, to advise and assist in mobility and countermobility functions. The engineer liaison teams also coordinate, as necessary, with other staff elements, including the chief of information warfare (IW). Liaison team leaders speak for the commanders

of their respective units.

Task Organization

At each level of command, the commander or his operations officer decides on the task organization of subordinate engineer units. Operational employment of engineer units does not follow strict organizational lines. The OPFOR does not always employ engineer units as complete entities.

Engineer tasks are integral to all OPFOR organizations. Although engineer assets generally are constituent at no lower than brigade or brigade tactical group (BTG) level, the OPFOR prefers to task organize for mission success at even lower levels, when the assets are available. This may dictate that, instead of maintaining large engineer units, the commander may choose to break them down and combine them into smaller (sometimes much, much smaller) multirole engineer support groupings. These engineer groupings range in size from brigades down to multirole platoons and engineer squads. An example of this flexible task organization would be the allocation more minelaying assets on an exposed flank or a high-speed avenue of approach for enemy armored vehicles. Another would be that an OSC that is task- organized for operations in a desert environment would not receive water obstacle-crossing units, but might add more mineclearing units.

There are no real doctrinal constraints on task organization for mission success. The ability to allocate assets downward and to task organize is restrained only by the availability of assets and the nature of the mission. At the operational level, however, the primary responsibility of the engineers is to support and ensure the mobility andÂ survivability Â of Â operational units while retaining a significant countermobility capability to impede (or canalize) the enemyâ s progress. The primary engineer reconnaissance function at the operational level is route reconnaissance.

With advice from engineer experts on his functional staff, the operations officer on the OSC staff uses the OSCâ s engineer resources to form task-oriented groupings according to the commanderâ s decision for the operation and his instructions on engineer support. He forms groupings toâ

- Conduct engineer support (reconnaissance, mobility, countermobility, and survivability) at any level.
- Augment maneuver units.
- Augment other operational-level units.
- Support IW.

The most frequent operational employment of constituent or dedicated engineer, engineer reconnaissance, and road- and bridge-construction units generally involves the formation of one or more functional groupings. Some of these areâ

- Obstacle detachments (ODs) to create minefields and other obstacles.
- Movement support detachments (MSDs) to perform route reconnaissance, route preparation, mineclearing, and route marking.
- Obstacle-clearing detachments.
- Engineer reconnaissance patrols.

An OSC may form several of each, and each may be based on an engineer unit as large as a battalion. The OSC may also create an engineer reserve.

Missions

The primary engineer missions performed in combat are in the categories of reconnaissance, mobility, countermobility, and survivability. The OPFOR recognizes several basic combat tasks engineers perform in support of combined arms operations. Some of these tasks are toâ

- Reconnoiter the enemy and the terrain.

- Prepare fortifications.
- Prepare and maintain movement routes.
- Clear passages through obstacles and areas of destruction.
- Equip and maintain gap crossings.
- Establish engineer obstacles.
- Support IW.
- Extract and purify water and establish water supply points.
- Carry out engineer measures to eliminate the effects of nuclear, biological, and chemical (NBC) and precision weapons.

For more detail, see the sections later in this chapter dedicated to Engineer Reconnaissance, Survivability, Countermobility, and Support to Information Warfare. For more detail on mobility support, see FM 7-100.2.

Support to Offensive Operations

In the offense, the engineersâ primaryprimary mission is to support the operation plan. Emphasis is onâ

- Clearing and maintaining routes for maneuver units.
- Clearing or removing mines and other obstacles.
- Crossing gaps.
- Creating obstacles to assist in flank protection and protection against counterattacks.

Preparation

To prepare for offensive operations, engineer tasks includeâ

- Performing engineer reconnaissance of the terrain and the enemy.
- Preparing assembly areas and movement routes for maneuver forces, including reserves.
- ConstructingÂ protective Â positions Â forÂ systems, Â units,Â and Â command posts (CPs).
- Establishing and improving road networks to support maneuver forces.
- Preparing alternative airfields and highway strips to support air assets.
- Ensure the integration of engineer support to IW.

Conduct

During Â the Â conductÂ ofÂ offensive Â operations, Â engineerÂ support Â includesâ

- Providing tailored engineer support where it is needed, when it is needed.
- Continuing reconnaissance of the enemy and terrain.
- Maintaining airfields and roads.
- Improving road networks and other movement routes to support commitment of reserves or follow-on forces.
- Providing support for the crossing of water obstacles and other gaps.
- Constructing protective positions for systems, units, and CPs, as they relocate.
- Helping to repel enemy counterattack.
- Supplying engineer equipment, materials, and technical assistance to maneuver units and other OPFOR units.
- Facilitate maneuver despite enemy and natural obstacles and possibly NBC-contaminated areas.

Support to Defensive Operations

OSC engineer forces are heavily engaged in the preparation and conduct of an operational defense. Comprehensive engineer preparation in the entire area of responsibility (AOR) is an important precondition for holding battle positions, as well as for troop maneuver.

Engineer support for defensive operations places emphasis on fortifying battle positions and

assembly areas, performing engineer camouflage, concealment, cover, and deception (C3D) measures, and adapting the terrain for defense. The defense is also conducive to the extensive use of various obstacles to interfere with the enemyâ as advance.

The general aims of engineer support to defensive operations includeâ

- Controlling access and tempo by delaying, disaggregating, and canalizing enemy forces.
- Establishing conditions necessary for organizing the defense.
- Protecting personnel and equipment from the effects of conventional direct and indirect fires, precision munitions, and NBC attacks.
- Building fortifications, battle positions, and assembly areas.
- Preparing and maintaining maneuver and supply routes.
- Creating or improving existing obstacles.
- Preparing decoys and deception positions.
- Ensuring the integration of engineer support to IW.

The type and scale of engineer support depends on the operational situation, enemy forces, and the conditions under which an OPFOR transitions to the defense. If the OPFOR does so during the course of the offense, support may have to begin with the protection of threatened axes by ODs and antitank reserves (ATRs) and the route work needed for regrouping.

Preparation

Engineer support for preparing an AOR for defensive operations consists of the following:

- Conducting engineer reconnaissance of the enemy and terrain.
- Preparing fortifications for protecting weapons, personnel, and equipment.
- Preparing routes for counterattack forces.
- Constructing Â obstaclesÂ (coordinated Â with Â the Â fireÂ support Â plan Â and natural obstacles).
- Preparing C3D measures in support of IW.
- Maintaining the water supply.

Conduct

During defensive operations, engineer support consists of improving on and expanding the scope of all the above measures and undertaking new tasks as situations develop. Such tasks include clearing obstacles, crossing gaps, and eliminating the effects of NBC and precision weapons.

Support to Information Warfare

The OPFOR has responded at all organizational levels to the challenge posed by enemy advances in sensors and weapons. A wide variety of engineer activities contribute to IW, particularly in support of C3D measures. This support involves three interrelated areas:

- Deception (signature-enhancing measures).
- Camouflage and concealment (signature-reduction measures).
- Obscurants (measures used both to conceal real equipment and enhance the effectiveness of decoy equipment).

OPFOR combat engineer units are a high priority for deception efforts, since their composition and disposition on the battlefield are indicators of how and where the OPFOR expects to conduct its main offensive or defensive effort. Therefore, the OPFOR establishes deception positions and engineer obstacles, supported by decoy vehicles.

Offense

During the offense, engineer support of deception measures can includeâ

- Construction of decoys and deception positions.
- Preparation of false routes to provide misleading indicators.

Defense

The OPFOR uses various deception measures to mislead the enemy about size and location of forces and weapon systems and about the nature of defensive engineer preparations. Engineer support of deception measures can includeâ

- Use of screening characteristics of terrain, darkness, and other conditions of limited visibility during engineer preparation of defensive positions and positioning of forces.
- False actions to draw attention from actual defensive preparations.
- Construction of artificial screens and concealment (such as horizontal and vertical screens, or corner reflectors).

Sufficient engineer support is critical to the success of any defensive deception plan. Units in the main defense force receive the priority of effort. However, engineers typically do not begin work supporting deception until they have completed all measures required for camouflage, concealment, and cover.

Engineer Reconnaissance

The specific missions of engineer reconnaissance are toâ

- Discover enemy engineer measures taken to fortify battle positions and to lay and clear minefields and demolitions.
- Determine movement routes (by the conditions of roads, bridges, and fording sites).
- Determine the characteristics of obstacles and locate bypass routes.
- Determine water availability (or add more robust capability).
- Observe enemy engineer activity.[1]
- Determine requirements for special engineer equipment, allocation of engineer assets, and the subsequent task organizations of subordinate and supporting engineer units.
- Report the locations of any enemy units encountered.
- Advise the commander and staff on locations the enemy is likely to occupy, based on the presence of favorable conditions, such as accessibility, concealment, and water supply.

Route Reconnaissance

A primary goal of engineer reconnaissance at the operational level is to provide comprehensive information on the suitability of movement routes. Engineer reconnaissance, performed independently or with other reconnaissance forces, plays a significant role in ensuring freedom of movement and access to various areas of the battlefield. Units performing engineer reconnaissance make the following determinations:

- The degree of trafficability of the entire route.
- The location and nature of obstacles and forces or assets needed to overcome them.
- The condition of crossing sites over rivers, canals, streams, and ravines.
- The location and quantity of material potentially useful for improving the movement route.
- The natureÂ of Â theÂ terrain Â andÂ location Â ofÂ areas Â withoutÂ natural concealment.

The purpose of route reconnaissance is to select suitable routes along the axis of movement and to identify suitable halt areas that provide concealment. Engineer reconnaissance can also identify possible infiltration routes. The reconnaissance patrol relays topographical and terrain information back to the unit that sent it out. Route reconnaissance can occur throughout the AOR, in offense or defense.

Offense

During the offense, the primary engineer reconnaissance mission is to obtain more precise

information onâ

- Battle damage created both during offensive preparation and during the execution of the offense.
- Troop movement routes and trafficability of off-road terrain.
- Locations where the enemy established obstacles.
- Locations for establishing obstacles during enemy counterattacks.
- Water obstacles on friendly forcesâ axes of advance.

Engineer reconnaissance during the offense seeks to obtain information on the nature of enemy fortifications, defensive positions, and obstacles. The basic methods for obtaining this information are observation and aerial or ground photography.

Defense

Engineers assist in reconnaissance and preparation of the defense by determining the protective and camouflage features of the terrain and by helping select positions for CPs and unit battle positions. Engineers also determine road and bridge conditions in the AOR, availability of local materials for construction of positions, and the status of the water supply.

Survivability

Preparing fortified positions is a task for engineers in both the offense and defense. Fortified positions increase weapons effectiveness and protect personnel, weapons, and materiel. Engineers give priority to digging in CPs and key components of the OPFORâ combat power. Fortification preparation combines and uses to best advantage the terrainâ protective properties, local construction materials, and engineer excavation equipment. The C3D measures discussed above, under Support to Information Warfare, also contribute to survivability.

Offense

In preparation for offensive action, the primary use of field fortification is in the preparation of assembly areas. Even there, the tasks of preparation typically exceed the capability of engineers in the limited time available. Consequently, the preparation of assembly areas becomes a shared responsibility involving all available personnel and equipment of all branches.

Normally, the OPFOR locates assembly areas far enough from enemy forces to deny the enemy ground observation and to lessen direct-fire effects. It uses field fortification in a way that allows a smooth and protected movement of troops and supplies in and out of the assembly areas.

Defense

When the OPFOR is transitioning to the defense and preparing complex battle positions or sanctuary areas, advance engineer deployment allows better use of terrain features and constructed fortifications. Engineers also have more time to construct or improve routes for movement of troops and supplies and to conceal forces and caches or short-duration storage facilities. In most cases, engineer units must concentrate their effort on only the most important parts of the AOR.

The full preparation of defensive positions involving entrenchments, communications trenches, positions for tanks and infantry vehicles, and protected CPs is a labor-intensive process. It often exceeds the capability of pure engineer units. Consequently, the OPFORâ approach is to use all available personnel and equipment. Units of all arms and services receive training in preparing field fortifications and emplacements.

Countermobility

Creating engineer obstacles and carrying out demolition activities are significant engineer functions in all phases of combat. The obstacle plan is tailored and integrated into the overall operation plan. Engineer obstacles include any actions taken to inflict losses and to delay and impede enemy movement. In the offense, obstacles protect flanks, disrupt counterattacks, and strengthen captured positions. In the defense, engineer obstacles may strengthen the defense, disrupt enemy operations, and cover gaps.

Explosive Obstacles

The widespread use of landmines on todayâ battlefields results from a combination of mass production, plastic mines, improved battlefield delivery systems, and development of sophisticated fuzing. Remotely-delivered mines have expanded capability for changing the tempo of combat.

Minefields

The five basic types of OPFOR minefields are antitank (AT), anti-personnel (AP), mixed, decoy, and antilanding. AT minefields are the primary type of OPFOR engineer obstacle and serve to destroy or disable armored and other vehicles. They are primarily established in belts consisting of multiple rows on avenues that are favorable for armored vehicles. Wherever possible, minefield belts will be tied into natural terrain obstacles to reduce the mine requirement. The OPFOR sets up conventional AP minefields in support of friendly battle positions, in front of AT minefields, or along dismounted avenues of approach. Mixed minefields consist of both AP and AT mines. Decoy minefields are a significant form of deception used to slow movement or deceive as to true unit locations. Antilanding minefields prevent landings by amphibious, airborne, or heliborne assault forces.

Minelaying

The methods and extent of minelaying depend onâ

- The OPFORâ intentions.
- The operational and/or tactical situation.
- Terrain characteristics.
- The type of mine.
- Time available.
- Available engineer support.

Emplacement means may be manual, mechanical, or remote. Manual emplacement is the most labor-intensive and time-consuming method and may not always be possible in a fluid battlespace. The OPFOR not only will use mechanical minelayers, but also will continue to develop methods of remote minelaying, including delivery by minelaying helicopters, fixed-wing aircraft, or cannon and rocket artillery. Rapidly laid and scatterable AT mines in support of maneuver operations will predominate on most battlefields. The same types of minefield may also support a situational defense. If the OPFOR plans only a temporary halt or defensive action, it can mechanically surface-lay small protective minefields. It may also use remotely-laid minefields (probably with self-destruct options) and controlled minefields.

Remotely-Delivered Mines

The ability to remotely deliver mines provides the OPFOR with the capability to respond rapidly with thousands of landmines at any point on the battlefield. The OPFOR can employ remotely-delivered minefields against choke points to delay and cause bunching that could create vulnerability to air or artillery attack. Remotely-delivered minefields fill gaps created by enemy

minefield breaching efforts and can cause confusion and delay in assembly areas. They can halt enemy attacks in areas not covered by an OD (or gain time for an OD to do its work). Maneuver

forces use remote mining to protect their flanks or to attack targets deep in enemy territory or anywhere in the AOR. Remote minelaying can be useful against enemy columns, areas of concentration, CPs, firing positions, and other targets. Such unpredictable minefields increasingly dominate OPFOR countermobility operations.

Remotely-delivered (or scatterable) mines are laid without regard to classical patterns. They are designed to be delivered by aircraft, cannon artillery, multiple rocket launchers (MRLs), or ground vehicles, or they can be hand-thrown or emplaced by man-portable mine dispensers.

Artillery. Some cannon artillery systems are capable of delivering both AP and AT mines. However, MRLs are the primary means of remote minelaying. The principal advantage of MRL mine delivery is its ability to quickly emplace large minefields in a single volley, while minimizing exposure to enemy targeting and weapon systems.

Ground Vehicles. Within recent years, the trend has been to mount scatterable-mine dispensers on ground vehicles. Both AP and AT mines can be launched from ground vehicles. This also gives the engineers the ability to reseed or reinforce an obstacle without entering the minefield itself.

Infantry. OPFOR infantry units may employ man-portable remote mine dispensers. These man-portable dispensers, weighing only a few pounds, are ideal for installing small, defensive, AP or AT minefields. Infantry-fired ground dispensers allow units to remotely emplace minefields to protect their battle positions, flanks, and boundaries between units, or to cover firing lines and gaps in combat formations. They can quickly close breaches in existing protective minefields and increase the density of mines on armor avenues of approach.

Aerial. Both AT and AP minefields can be laid using aerial minelaying systems. Bombers or ground-attack aircraft can lay remotely-delivered minefields throughout the AOR.

Helicopter minelaying systems are used to emplace small or large minefields in the execution of offensive or defensive operations. This type of aerial minelaying is normally conducted over friendly territoryâ alongflanks or in support zones. When supporting an airborne or heliborne landing, helicopters may lay mines on enemy-held territory. Helicopter mine chutes are a tool available to even low-technology helicopter forces for installation on a variety of helicopters by low-echelon maintenance units.

Obstacle Detachment

The OD is the basic building block of the OPFORâ scountermobility effort. It is a task organization composed primarily of engineers. An OD can vary in size depending on the operational situation and the needs of the commander. An OSC may form several ODs based on its constituent or dedicated engineer units. An OD formed at this level is typically based on an engineer unit as large as a battalion. The OSC generally tries to create one OD for each ATR formed from its AT assets.

ODs formed by an OSC may be assigned in a supporting relationship to the OSCâ ssubordinate maneuver units, or they can act independently at the OSC level (for example, to protect an exposed flank). They are a standard feature of tactical and operational task organizations. With their ability to rapidly lay mines and construct obstacles, their mission is to deny the enemy access to key terrain, particularly those avenues of approach most suitable for armored vehicles.

Although the OD can operate independently, it usually operates with an ATR to provide flank protection and to repel enemy counterattacks. ATRs may provide covering fire over the minefields that the ODs emplace. The OD sometimes operates with mechanical minelaying platoons.

Offense

In the offense, the OD usually moves with the ATR either on an open flank or in a central position ready to deploy to any threatened axis. In the latter case, it usually advances with maneuver units to ensure a prompt response to any threat.

The OPFOR considers surprise a critical factor in mine warfare. Enemy reconnaissance can discover minefields laid too long in advance and can take measures to overcome them. Therefore, it is often more effective to lay a minefield during the course of a battle, preferably at the last minute, directly in the path of a developing threat. Using mines in this way is not only tactically advantageous, but also economical. This may be an important consideration when supplies are limited.

The OPFOR uses ODs aggressively, maintaining close contact with the enemy and attempting to mine areas in which the enemy has already committed himself. An OD may join an ATR to ward off enemy counterattack threats.

Defense

In the defense, the OPFOR commander may hold the OD and other forces in reserve and can quickly employ them during an enemy attack, to mine potentially vulnerable gaps. Engineer tasks during the defense implement obstacle plans, particularly AT obstacles. Together with ATRs, ODs provide a quick-reaction AT force to block enemy penetrations.

Engineers create obstacles on possible enemy approaches to OPFOR battle positions or artillery and air defense firing positions, in the gaps between battle positions, and on flanks. They normally construct barrier systems in coordination with the overall fire support plan

Engineers can lay mines and construct obstacles in the disruption zone and on likely enemy armored avenues of approach. They can also lay obstacles in the depth of friendly units in the battle zone, and at subsequent defensive lines throughout the AOR. However, simultaneous obstacle construction throughout the AOR can only occur when sufficient time, equipment, and personnel are available. In any part of the AOR, minefields and other obstacles require barriers, security, and marked maneuver passages.

Offensive Countermobility

Engineer countermobility missions are not strictly an engineer function. Rather, they are part of an overall, all-arms effort to deny the enemy freedom of maneuver. For example, many remotely-delivered mines are emplaced by means other than engineer assets. The OPFOR will also employ all means available to attack the enemyâ mobility assets at every opportunity. The elimination or degradation of key mobility assets (such as bridging and mine-clearing assets) can severely limit the enemyâ progress, range, or sustainability. This is part of the OPFORâ systems warfare approach to combat.

Preemptive attacks against the enemyâ bridging and mineclearing systems can occur at very early stages in the conflict, often well before the foreseen usage of such mobility assets. The OPFOR might try to destroy all mobility assets, thereby confining the enemy to his aerial or sea port of debarkation (APOD or SPOD), or it might let the enemy commit his assets and then destroy them piecemeal. Whichever method the OPFOR chooses, it would attempt to mask the identity of the true target by also hitting what the enemy may deem â higher-value targets,â such as maneuver troops and equipment, during the same attack. Thus, the enemy may believe the destruction of his mobility assets to be collateral damage rather than the intended target, and he may not place a high priority on replacing these as critical items.

Strategic Context

Operational-level engineers support the Stateâ various strategic-level courses of action and the OPFOR principles of operations versus an extraregional power (discussed in Chapter 1 and in

FM 7-100). Specific engineer requirements are determined by the operational mission of the supported OSC within whichever strategic-level course of action is occurring in a given AOR at a given time. That may be regional, transition, or adaptive operations. Because of the requirement to transition rapidly from regional to adaptive operations and perhaps back to regional operations, engineers assigned to OSCs may be supporting more than one course of action simultaneously.

Regional Operations

Operational-level engineer units involved in regional operations facilitate the mobility and high rate of advance of joint, combined arms, interagency, and/or multinational forces while enhancing the survivability of forces. Although the OPFOR generally conducts engineer countermobility activities at the tactical level, it tailors the obstacle plan to the overall operation and integrates it into the operation plan. It uses obstacles to disaggregate, delay, block, and canalize enemy forces.

Transition Operations

Since transition operations can overlap both regional and adaptive operations, engineer actions can be various combinations of those occurring during regional or adaptive operations. The need for rapid transition from regional to adaptive operations (and vice versa) presents the engineers several challenges. For example, engineers still supporting regional operationsÂ may beÂ involvedÂ inÂ water-crossingÂ activities, whileÂ engineers

supporting units transitioning to adaptive operations may be blowing up bridges to preserve friendly forces. Engineers supporting joint, combined arms, interagency, and/or multinational units transitioning to regional operations may be laying minefields to fix an extraregional foe while other engineers are providing mobility and survivability support to units launching offensive operations against a regional foe. Therefore, some engineers in transition operations may be involved in those tasks normally associated with regional operations while other engineers units may be involved in tasks normally associated with adaptive operations.

Several engineer missions become more critical during transition operations when shifting to adaptive operations. For example, IW takes on a more significant role with use of C3D measures to protect forces while they are attempting to get into sanctuary and begin adaptive operations. Engineer reconnaissance must locate clear, and preferably concealed, routes to expedite unitsâ movement to sanctuary and limit their exposure to extraregional forces.

The State may have done some advance preparation of defensive positions in peacetime or during regional operations. However, the OPFOR takes advantage of any time required for the extraregional enemy to build up combat power, using that time for additional engineer preparation involving all means available. Engineer units or other forces supervised by engineers provide fortified positions or repair or reinforce those positions already in place. Caches and water sources, if not in place, will have to be prepared.

Adaptive Operations

During adaptive operations, several trends in engineer employment may be at odds with one another. On the one hand, the dispersal of forces may require task organization of engineer units into smaller groupings. With dispersal and decentralization, however, the task organization of operational-level engineer assets to support tactical-level missions becomes increasingly difficult. As the OPFOR goes into a force-preservation mode, commanders may tend to create larger engineer reserves and put into protected storage some scarce engineer assets that will be critical to success in later operations. Examples of such high-value assets could be bridging, route-clearing equipment, mechanical minelayers, and other heavy engineer equipment. The process begins during transition operations but has the largest impact during adaptive

operations. This equipment will be protected and might only be used for high-priority missions or in areas shielded from the enemy. The shortage of key equipment is further intensified by any combat losses.

Since requirements for engineer support do not change during the absence of heavy equipment, the OPFOR has planned the complete integration of civilian and military engineer resources to help compensate for this loss. The lack of engineer units and assets available to the lower levels is compensated for by the sharing of engineer tasks and responsibilities throughout the OPFOR branches and maximizing the use of manual labor (military and civilian) and assets other than those of engineer units. Since maneuver units or civilian workers may have to perform the majority of engineer tasks, engineers are also responsible for supervising and providing guidance and technical expertise to these groups. This allows the tasks to be performed with the least amount of engineers and mitigates the loss of units and equipment.

The basic engineer missions during adaptive operations remain reconnaissance, countermobility, survivability, and mobility, along with the task of support to IW. These all occur at all levels of command all over the battlefield, and priorities of engineer effort vary according to the specific situation, which can be unpredictable. Examples of how these missions and tasks support adaptive operations are listed below.

Reconnaissance

The focus of engineer reconnaissance during Â adaptiveÂ operations will be on areas that support the creation of windows of opportunity or the exploitation of opportunities that result from existing conditions in the AOR. Engineers can help determine the most likely routes the enemy might take, as well as identify routes for OPFOR units undertaking counterattacks or the maneuver component of a strike.

Countermobility

The OPFOR makes extensive use of countermobility operations to control access and tempo by delaying, disaggregating, and canalizing enemy forces. The obstacle plan is completely integrated with the maneuver, fire support, and IW plans. Minefields and other obstacles used in support of adaptive operations are extremely innovative, irregular-shaped, and thoroughly merged with the terrain. Minefields also tend to be much smaller than those laid in regional operations (especially linear operations). Many are nuisance minefields, rather than being designed to destroy large numbers of enemy forces.

Survivability

The construction of battle and fighting positions is a labor-intensive process and is therefore a shared responsibility of engineers and supported units. Maximum use of civilian engineer assets and personnel continues during adaptive operations. Survivability activities during adaptive operations have several unique engineer requirements. Some examples are toâ â

- Take full advantage of the screening, protective, C3D techniques, along with careful selection of terrain to passively deny the enemy the ability to acquire OPFOR positions for targeting.
- Make extensive use of local building materials, equipment, and work force.
- Protect CPs and logistics sites.
- Bury communications lines.
- Construct false positions, equipment, movement routes, and lines of communication.
- Assimilate minefields and obstacles to the terrain.
- Prepare caves, tunnels, and tunnel complexes in which troops can live and from which they can fight.

Mobility

It is critical that the OPFOR maintain the ability to move unimpeded during adaptive operations. This ability allows the OPFOR to control the access and tempo of enemy forces. As long as the OPFOR has complete access to the battlefield, it will allow no sanctuary to the enemy and determine the nature of the conflict. Engineer support can create opportunities for infiltration of small forces into unexpected locations, to inflict damage or to support IW.

Rarely during adaptive operations would the OPFOR attempt the classic opposed water crossings it can use during regional operations. However, there may be times when the OPFOR must cross rivers in territory occupied by the enemy. Even then, it would attempt an opposed crossing only if convinced of success and if the enemy did not believe the OPFOR would attempt the crossing. Such crossings would be integrated into the overall operation plan and the IW plan.

More likely, however, is that the OPFOR would attempt to cross the river surreptitiously at night or during inclement weather. This would allow the OPFOR to infiltrate unitsâ few vehicles at a timeâ across the river. The units would regroup at a designated area and continue operations. Engineer support for this may be only engineer reconnaissance of the river and routes. The situation may also call for the engineers to build (undetected) an underwater bridge out of sandbags, or to make rafts rigged to transport vehicles.

The OPFOR may be required to breach enemy minefields. Although it may breach them in the more conventional manner described in FM 7-100.2, the OPFOR can also devise innovative methods the cross the minefield. One such method might be to manually clear a path through the minefield surreptitiously. Several paths could be cleared in this fashion. Then, at a time of the OPFORâ own choosing, dismounted troops could infiltrate through the minefield and rendezvous at a designated location on the other side, undetected by the enemy.

Support to Information Warfare

The complete integration of engineer support to IW continues to be critical in adaptive operations. Deception is one of the basic elements of IW. Engineer support of the deception plan is vital for the deception to succeed. Engineersâ largest role in an integrated deception plan is that of constructing physical decoys (simulations in deception positions) enabling the enemy to see what he expects to see. These decoys cover a wide spectrum of types and must be introduced or allowed to be â discoveredâ in the same sequence in which a â realor existingâ unit would emplace them. The general priority of engineer construction is from front to rear, beginning with the primary fighting positions, then the temporary and alternate positions. The time sequence in which these â appearâ gives credibility to the deception.

However, engineer support to IW is not limited to C3D measures. For example, engineers may support psychological warfare with activitiesÂ to lower morale and instill a sense of tentativeness among enemy soldiers or to undermine confidence of â enemyfriendlyâ populations. This can be achieved simply by the ubiquitous use of booby traps and AP mines.

References

1. Thecomposition and disposition of enemy combat engineer units are important indicators of how and where the enemy expects to conduct his main offensive or defensive effort. Positioning of bridging and mineclearing assets may tip off planned enemy offensive action. When the enemy is preparing to defend, all obstacle-creating assets, such as minelayers, are of particular interest.