Chapter 6

Engineer Planning for Operations

Engineer planning can be a challenging endeavor. Understanding how the engineers affect operations equips the planner with the background to form a plan of engineer actions. The participation of engineers in the planning process is crucial to the success of military operations. The omission of engineer considerations in any operation may have a negative impact on the entire campaign. Consequently, engineer planning must be thorough, concurrent, and coordinated at all levels of command and reflect both the tactical and operational engineer requirements of the MAGTF. Engineer planning is based on the commander's concept of operation, engineer missions, priority of effort, engineer estimate of the situation, accessible construction resources, and the engineer forces available.

SCOPE OF ENGINEER OPERATIONS

The engineer's role in any operation will normally fall under one or more of the following categories:

- Supporting the MAGTF scheme of maneuver.
- Supporting joint operations.
- Supporting the MAGTF in civil engineering.

The MAGTF engineer staff must be prepared to plan and execute any of these operations concurrently or sequentially. Although the initial mission and planning for an operation may not appear to require one or more of these operations, the engineer staff must be prepared to handle any additional operational requirements. The phenomenon known as "mission creep" often introduces one or more new requirements. Because engineering is largely driven by logistics and time constraints, a good engineer staff should have the foresight to collect data and formulate plans for all foreseeable contingencies and be prepared to implement them as needed.

Supporting the MAGTF Scheme of Maneuver

Engineer missions enhance the MAGTF scheme of maneuver. Engineer efforts take on many forms during the phases of an operation, but are always focused on increasing the tempo of operations by physically shaping the battlespace. The engineer effort in support of the MAGTF is expeditionary in nature. Missions and tasks are based on standards that account for the speed and austerity of expeditionary operations. Marine Corps engineers do not have the organic capabilities necessary to support a large MAGTF indefinitely. During sustained operations ashore (SOA), large infrastructure requirements and needs for more refined construction will develop. As this occurs, the MAGTF commander will need to acquire additional engineer resources from both military and civilian sources to develop a comprehensive support plan.

Supporting Joint Operations

Marine Corps engineers are organized to provide an organic engineer capability to each MAGTF major subordinate element. As such, during joint operations, Marine Corps engineer assets normally do not support general support requirements for the overall joint force.

Supporting the MAGTF in Civil Engineering

JP 4-04 provides detailed discussion for planning and executing civil engineering support for operations. Marine Corps engineers do not have a civil engineering capability. A significant civil engineering capability exists in the Army, Navy, and Air Force to support the MAGTF as part of a joint force operation. The engineer staff is responsible for developing requirements and coordinating this support.

PREPARING FOR ENGINEER OPERATIONS

When preparing for and participating in the planning process, the MAGTF engineers must consider the following functions:

Intelligence

The rapid introduction of U.S. forces requires detailed, continuous, and timely intelligence. Engineers assess available infrastructure for possible general engineering requirements including airfields,

MSRs, ports, utilities, and logistics facilities. They determine threat engineer capabilities in likely lodgment areas including requirements for countermine and counterobstacle capabilities needed with the early-entry force. Engineers assist in the analysis of topographic features, the nature and characteristics of the AO, and the creation of special products allowing planners to—

- Develop maneuver operations.
- Select high-payoff targets.
- Acquire precise deep-target information.

Reconnaissance

The key to effectively using combat power is gathering information about the enemy and the AO through reconnaissance. Reconnaissance provides current battlefield information helping the commander plan and conduct tactical operations. When properly planned and executed, reconnaissance greatly enhances maneuver, firepower, and force protection. The types of reconnaissance missions the engineers conduct are—

- Tactical (route, zone, and area).
- Obstacle.
- Route classification.

Combat Engineering

Mobility. Mobility enables the force commander to maneuver units into advantageous positions. At the operational level, the commander relies on mobility to achieve surprise, mass at the critical time, and maintain momentum.

Countermobility. Countermobility augments natural terrain with obstacle systems according to the commander's concept of operations and attacks the enemy's ability to maneuver its forces. With its movement disrupted, turned, fixed, or blocked, the enemy is vulnerable to our forces. Engineers ensure obstacle integration through the proper exercise of command and control focused on obstacle emplacement and obstacle control.

Survivability. Force protection is a principal concern of leadership at all command levels. Marines in Haiti, Somalia, and Northern Iraq faced a threat from armed and organized opposition groups. The rise in terrorist activities, such as the bombing of Khobar Towers in Saudi Arabia, is of increasing concern. This threat is not limited to operations involving a declaration of war. At a minimum, in any operation, forces will need protection from the natural elements (e.g., heavy winds, freezing temperatures, fires, or floodwaters) and disorganized bands of looters or rioters.

Engineers, in concert with maneuver forces, build such items as protective bunkers, wire structures to control personnel, protective berms, and overhead cover to protect the force.

General Engineering

Lines of Communications (air, sea, land). Engineers assist in establishing and maintaining the infrastructure necessary for sustaining military operations. Sustainment tasks include new construction and repair of existing construction; logistics support facilities, supply routes, airfields, railroads, ports, water wells, power plants, electrical distribution expertise, and pipelines. Force projection forces (for receiving equipment and Marines) are maintained to develop the infrastructure to sustain the MAGTF. The task is complete when the support structure is in place to redeploy the MAGTF.

Beddown Facilities. Providing facilities for the force is an engineer function, whether it is building base camps or leasing facilities. The billeting requirements go beyond tent floors or strong-backed tents and include developing facilities for—

- Personal hygiene.
- Messing.
- Sanitation.
- Administrative functions.
- Morale, welfare, and recreation (MWR).
- Logistics.
- Landfill operations and environmental support are also among force beddown requirements.

Utilities. Utility operations are electrical, hygiene equipment (water purification, plumbing, and laundry), and refrigeration support for the MAGTF. The NCF and Army support the MAGTF's additional utility requirements.

Water-Well Drilling. Water well drilling is essential, especially when operating in austere environments. NCF well-drilling units provide personnel and equipment capable of drilling and developing water wells in virtually any area with an underground water source.

Bridging. Military traffic engaged in rapid movement on the battlefield must be able to cross wet or dry gaps in existing road networks or natural high-speed avenues. Maneuver forces and logistical

forces depend on permanent, expedient, or tactical bridges to sustain mobility.

Explosive Ordnance Disposal. Destruction of ordnance materials is a unit commander's decision. The purpose of this intentional destruction is to prevent the enemy from capturing stockpiles of ordnance. Whenever the commander orders destruction, two primary considerations are site selection and safety. EOD units are responsible for destroying damaged or unserviceable ordnance materials in a combat zone. Essential components of sets and kits must be sufficiently damaged to prevent complete reassembly by cannibalizing from undamaged components. Such destruction is a command decision-based on the tactical situation, security classification of the ordnance materials, their quantity and location, facilities for accomplishing destruction, and time available. Usually, burning and detonating or a combination of both is the most effective means of destruction. Commanders must ensure they know the exact materials contained in any ordnance they plan to destroy, especially if the ordnance is captured enemy stockpiles.

Vertical and/or Horizontal Construction. JP 3-07 and JP 4-04 establish construction standards for facilities. In planning, estimating, and scheduling projects, the engineer staff should rely on the navy engineering field division for support. MAGTF engineers concentrate on construction of initial and temporary standard facilities.

Initial Standard. The initial standard is for immediate operational support of units upon arrival in theater. The initial standard has austere facilities that minimize construction effort where usage is from 1 to 6 months (depending on the specific facility).

Temporary Standard. The temporary standard provides for sustained operations. The facilities provided are the minimum required to increase efficiency of operations for periods of time extending to 24 months. In some cases, it replaces initial standard.

Permanent Construction. Permanent construction is for personnel or resource protection. This includes, but is not limited to, revetments, shelters, and concrete barriers. Permanent construction is used only where it is cost or mission effective to use permanent facilities in place of, or to replace, initial or temporary standards.

Real Estate. The Marine Corps forces (MARFOR) component commander is responsible for coordinating real estate requirements within the command and with the geographic commander. In time of war, it is quicker and cheaper to lease facilities than it is to use combat engineer resources or contract construction. The use of combat engineers in this role detracts from their ability to provide mobility, countermobility, and survivability support to the forces. Contract construction requires funding, long lead times, construction time, and additional manpower to manage. In addition, it is not desirable to build permanent or semipermanent facilities in areas that U.S. forces will eventually abandon or not use for long periods of time. JP 4-04 provides details on real estate planning and operations.

The Navy Facilities Engineering Command (NAVFACENGCOM) provides the MAGTF real estate support for most contingency operations. NAVFACENGCOM real estate teams are the early deploying real estate experts. The mission is to provide real estate services to forces and agencies requiring or using real estate in the AO. They are generally self-sufficient in the area of operations.

Preparation and Planning

Engineers consider all of these things and introduces them into the planning process. Engineers use their expertise and unique capabilities to help the commander shape the battlespace. The goal is to make the enemy vulnerable to the commander's will.

THE ENGINEER'S ROLE IN THE PLANNING PROCESS

The planning process, as defined in MCDP 5, *Planning*, is a continuous cyclic mechanism that assists the commander in envisioning and refining a desired future, and the effective ways of bringing it about. The engineer commander and staff provides the MAGTF commander information throughout the planning process. Some information will be a brief "point of view," while other information will require detailed engineering studies with extensive supporting documentation. Given the wide range of engineer operations in support of the MAGTF, early and continuous involvement in the planning process is critical.

Assessing the Situation

The first step of the planning process is assessing the situation. The engineer staff will present the commander with friendly and enemy engineer relevant facts and assumptions. The engineer staff officer assists the commander in developing facts and assumptions by participating in the IPB and conducting the engineer assessment. The engineer develops facts and assumptions and supports the IPB process through the EBA. The engineer then analyzes the terrain and weather, using the five military aspects of terrain, and assesses their impact on operations. The function of the terrain analysis is to reduce the uncertainties regarding the effects of natural and manmade terrain on friendly and enemy operations. The process of preparing the MCOO assists the engineer in analyzing the military aspects of the terrain. The engineer will assist the G/S-2 in developing the MCOO.

The second step of the EBA is to analyze the threat engineer mission and capabilities and the enemy's doctrinal use of engineers. To do this, the engineer and G/S-2 will use the guidance and templates described in chapter 2.

The third step of the EBA is to evaluate friendly engineer capabilities and their impact on mission accomplishment. The engineer officer evaluates the task organization to determine the engineer organization and assets available and considers the possibility of additional support from maneuver forces and other engineer forces.

Establishing Goals and Objectives

The commander's intent, goals, and objectives are important elements of the estimate process. The desired outcome of the mission will provide the staff with a defined focus required to develop and analyze a COA. The engineer staff will focus primarily on identifying, integrating, and coordinating engineer tasks in support of the mission.

Conceptualizing the Course of Action

The COA is actions envisioned to achieve the desired outcome. The EBA provides a reference for the engineer participation in the COA development. At a minimum, the engineer ensures that the G/S-3 understands the engineer task organization and available combat power. The engineer begins to develop a scheme of engineer operations to support the COA. The engineer's initial scheme is a rough draft and is refined during the wargaming process.

Detail the Course of Action

This phase includes *execution* planning—developing practical measures for carrying out the COA—and the engineer must be an active participant. For example, the engineer must wargame the timing aspects of situational obstacles, obscuring and suppressing for obstacle breaching, and the positioning of forces and material for current and future operations. The engineer must be ready to interject thoughts and identify critical events and tasks. The engineer identifies engineer tasks and determines if a task is feasible based on the assets available. Also, the engineer must articulate the actions of threat engineers during course of action development.

Evaluate the Course of Action

Based on the staff recommendation, the commander announces a decision and COA or intent. The type and amount of detail that the engineer provides depends on the needs and preferences of the commander, but generally include—

- Concept of engineer support.
- Engineer mission priorities.
- Critical engineer events and/or actions.
- Task organization and command and support relationships.
- Obstacle overlay (including SCATMINE employment authority and concept for use by system type).
- Survivability estimate and priority.
- Critical tasks directed to subordinate units.
- Engineer's work time line.

Issue the Order

Once the commander makes a decision, the estimate provides the bulk of the information needed to prepare the force's OPLAN or OPORD.

PLANNING DOCUMENTS

Blank forms of engineer documents are found in MCRP 3-17B. The basic forms and reports are—

- Engineer Breaching Plan. A plan in five-paragraph order format that directs task organization, states mission, articulates execution, coordinating instructions; and administrative and logistic requirements, and details the command and control of a specific breaching evolution. It is the commander's

breaching directive to subordinate organizations. The GCE engineer staff prepares the breaching plan in coordination with detailed and specific information provided by subordinate engineer commanders.

- Barrier Plan. The engineer staff prepares the barrier plan. The barrier plan is a series of obstacle zones designed to shape the movement of the enemy at the operational and strategic levels of war. Normally in five-paragraph order format, barrier plans identify supporting organizations, state the mission, articulate execution; coordinating instructions; and administrative and logistic requirements, and detail command and control procedures.
- Engineer Obstacle Plan. An obstacle plan is prepared when the use of obstacle groups is essential to MAGTF operations. Primarily implemented by the GCE commander, this plan must fall within the constraints of the MAGTF barrier plan. The obstacle plan is an annex to the operations appendix to the OPLAN. It details the information required to emplace and/or activate friendly obstacles. It should specifically address obstacle requirements in support of the withdrawal plan required when executing amphibious operations.
- Engineer Appendix to the Operations Annex to the OPLAN. The engineer appendix to the operations annex of the OPLAN is a supporting document covering the engineer organization, mission, concept of operations, administrative, logistic, and command and control information.
- Engineer Estimate. The engineer estimate is a planning document that serves as a basis for the submission of conclusions to the commander. It presents the specialized viewpoints of the staff engineer officer. The engineer staff provides analysis to the commander of the principal engineer factors governing the operation and the comparative courses of action identified.

(reverse blank)

Chapter 6

Engineer Planning for Operations

Engineer planning can be a challenging endeavor. Understanding how the engineers affect operations equips the planner with the background to form a plan of engineer actions. The participation of engineers in the planning process is crucial to the success of military operations. The omission of engineer considerations in any operation may have a negative impact on the entire campaign. Consequently, engineer planning must be thorough, concurrent, and coordinated at all levels of command and reflect both the tactical and operational engineer requirements of the MAGTF. Engineer planning is based on the commander's concept of operation, engineer missions, priority of effort, engineer estimate of the situation, accessible construction resources, and the engineer forces available.

SCOPE OF ENGINEER OPERATIONS

The engineer's role in any operation will normally fall under one or more of the following categories:

- Supporting the MAGTF scheme of maneuver.
- Supporting joint operations.
- Supporting the MAGTF in civil engineering.

The MAGTF engineer staff must be prepared to plan and execute any of these operations concurrently or sequentially. Although the initial mission and planning for an operation may not appear to require one or more of these operations, the engineer staff must be prepared to handle any additional operational requirements. The phenomenon known as "mission creep" often introduces one or more new requirements. Because engineering is largely driven by logistics and time constraints, a good engineer staff should have the foresight to collect data and formulate plans for all foreseeable contingencies and be prepared to implement them as needed.

Supporting the MAGTF Scheme of Maneuver

Engineer missions enhance the MAGTF scheme of maneuver. Engineer efforts take on many forms during the phases of an operation, but are always focused on increasing the tempo of operations by physically shaping the battlespace. The engineer effort in support of the MAGTF is expeditionary in nature. Missions and tasks are based on standards that account for the speed and austerity of expeditionary operations. Marine Corps engineers do not have the organic capabilities necessary to support a large MAGTF indefinitely. During sustained operations ashore (SOA), large infrastructure requirements and needs for more refined construction will develop. As this occurs, the MAGTF commander will need to acquire additional engineer resources from both military and civilian sources to develop a comprehensive support plan.

Supporting Joint Operations

Marine Corps engineers are organized to provide an organic engineer capability to each MAGTF major subordinate element. As such, during joint operations, Marine Corps engineer assets normally do not support general support requirements for the overall joint force.

Supporting the MAGTF in Civil Engineering

JP 4-04 provides detailed discussion for planning and executing civil engineering support for operations. Marine Corps engineers do not have a civil engineering capability. A significant civil engineering capability exists in the Army, Navy, and Air Force to support the MAGTF as part of a joint force operation. The engineer staff is responsible for developing requirements and coordinating this support.

PREPARING FOR ENGINEER OPERATIONS

When preparing for and participating in the planning process, the MAGTF engineers must consider the following functions:

Intelligence

The rapid introduction of U.S. forces requires detailed, continuous, and timely intelligence. Engineers assess available infrastructure for possible general engineering requirements including airfields,

MSRs, ports, utilities, and logistics facilities. They determine threat engineer capabilities in likely lodgment areas including requirements for countermine and counterobstacle capabilities needed with the early-entry force. Engineers assist in the analysis of topographic features, the nature and characteristics of the AO, and the creation of special products allowing planners to—

- Develop maneuver operations.
- Select high-payoff targets.
- Acquire precise deep-target information.

Reconnaissance

The key to effectively using combat power is gathering information about the enemy and the AO through reconnaissance. Reconnaissance provides current battlefield information helping the commander plan and conduct tactical operations. When properly planned and executed, reconnaissance greatly enhances maneuver, firepower, and force protection. The types of reconnaissance missions the engineers conduct are—

- Tactical (route, zone, and area).
- Obstacle.
- Route classification.

Combat Engineering

Mobility. Mobility enables the force commander to maneuver units into advantageous positions. At the operational level, the commander relies on mobility to achieve surprise, mass at the critical time, and maintain momentum.

Countermobility. Countermobility augments natural terrain with obstacle systems according to the commander's concept of operations and attacks the enemy's ability to maneuver its forces. With its movement disrupted, turned, fixed, or blocked, the enemy is vulnerable to our forces. Engineers ensure obstacle integration through the proper exercise of command and control focused on obstacle emplacement and obstacle control.

Survivability. Force protection is a principal concern of leadership at all command levels. Marines in Haiti, Somalia, and Northern Iraq faced a threat from armed and organized opposition groups. The rise in terrorist activities, such as the bombing of Khobar Towers in Saudi Arabia, is of increasing concern. This threat is not limited to operations involving a declaration of war. At a minimum, in any operation, forces will need protection from the natural elements (e.g., heavy winds, freezing temperatures, fires, or floodwaters) and disorganized bands of looters or rioters.

Engineers, in concert with maneuver forces, build such items as protective bunkers, wire structures to control personnel, protective berms, and overhead cover to protect the force.

General Engineering

Lines of Communications (air, sea, land). Engineers assist in establishing and maintaining the infrastructure necessary for sustaining military operations. Sustainment tasks include new construction and repair of existing construction; logistics support facilities, supply routes, airfields, railroads, ports, water wells, power plants, electrical distribution expertise, and pipelines. Force projection forces (for receiving equipment and Marines) are maintained to develop the infrastructure to sustain the MAGTF. The task is complete when the support structure is in place to redeploy the MAGTF.

Beddown Facilities. Providing facilities for the force is an engineer function, whether it is building base camps or leasing facilities. The billeting requirements go beyond tent floors or strong-backed tents and include developing facilities for—

- Personal hygiene.
- Messing.
- Sanitation.
- Administrative functions.
- Morale, welfare, and recreation (MWR).
- Logistics.
- Landfill operations and environmental support are also among force beddown requirements.

Utilities. Utility operations are electrical, hygiene equipment (water purification, plumbing, and laundry), and refrigeration support for the MAGTF. The NCF and Army support the MAGTF's additional utility requirements.

Water-Well Drilling. Water well drilling is essential, especially when operating in austere environments. NCF well-drilling units provide personnel and equipment capable of drilling and developing water wells in virtually any area with an underground water source.

Bridging. Military traffic engaged in rapid movement on the battlefield must be able to cross wet or dry gaps in existing road networks or natural high-speed avenues. Maneuver forces and logistical

forces depend on permanent, expedient, or tactical bridges to sustain mobility.

Explosive Ordnance Disposal. Destruction of ordnance materials is a unit commander's decision. The purpose of this intentional destruction is to prevent the enemy from capturing stockpiles of ordnance. Whenever the commander orders destruction, two primary considerations are site selection and safety. EOD units are responsible for destroying damaged or unserviceable ordnance materials in a combat zone. Essential components of sets and kits must be sufficiently damaged to prevent complete reassembly by cannibalizing from undamaged components. Such destruction is a command decision-based on the tactical situation, security classification of the ordnance materials, their quantity and location, facilities for accomplishing destruction, and time available. Usually, burning and detonating or a combination of both is the most effective means of destruction. Commanders must ensure they know the exact materials contained in any ordnance they plan to destroy, especially if the ordnance is captured enemy stockpiles.

Vertical and/or Horizontal Construction. JP 3-07 and JP 4-04 establish construction standards for facilities. In planning, estimating, and scheduling projects, the engineer staff should rely on the navy engineering field division for support. MAGTF engineers concentrate on construction of initial and temporary standard facilities.

Initial Standard. The initial standard is for immediate operational support of units upon arrival in theater. The initial standard has austere facilities that minimize construction effort where usage is from 1 to 6 months (depending on the specific facility).

Temporary Standard. The temporary standard provides for sustained operations. The facilities provided are the minimum required to increase efficiency of operations for periods of time extending to 24 months. In some cases, it replaces initial standard.

Permanent Construction. Permanent construction is for personnel or resource protection. This includes, but is not limited to, revetments, shelters, and concrete barriers. Permanent construction is used only where it is cost or mission effective to use permanent facilities in place of, or to replace, initial or temporary standards.

Real Estate. The Marine Corps forces (MARFOR) component commander is responsible for coordinating real estate requirements within the command and with the geographic commander. In time of war, it is quicker and cheaper to lease facilities than it is to use combat engineer resources or contract construction. The use of combat engineers in this role detracts from their ability to provide mobility, countermobility, and survivability support to the forces. Contract construction requires funding, long lead times, construction time, and additional manpower to manage. In addition, it is not desirable to build permanent or semipermanent facilities in areas that U.S. forces will eventually abandon or not use for long periods of time. JP 4-04 provides details on real estate planning and operations.

The Navy Facilities Engineering Command (NAVFACENGCOM) provides the MAGTF real estate support for most contingency operations. NAVFACENGCOM real estate teams are the early deploying real estate experts. The mission is to provide real estate services to forces and agencies requiring or using real estate in the AO. They are generally self-sufficient in the area of operations.

Preparation and Planning

Engineers consider all of these things and introduces them into the planning process. Engineers use their expertise and unique capabilities to help the commander shape the battlespace. The goal is to make the enemy vulnerable to the commander's will.

THE ENGINEER'S ROLE IN THE PLANNING PROCESS

The planning process, as defined in MCDP 5, *Planning*, is a continuous cyclic mechanism that assists the commander in envisioning and refining a desired future, and the effective ways of bringing it about. The engineer commander and staff provides the MAGTF commander information throughout the planning process. Some information will be a brief "point of view," while other information will require detailed engineering studies with extensive supporting documentation. Given the wide range of engineer operations in support of the MAGTF, early and continuous involvement in the planning process is critical.

Assessing the Situation

The first step of the planning process is assessing the situation. The engineer staff will present the commander with friendly and enemy engineer relevant facts and assumptions. The engineer staff officer assists the commander in developing facts and assumptions by participating in the IPB and conducting the engineer assessment. The engineer develops facts and assumptions and supports the IPB process through the EBA. The engineer then analyzes the terrain and weather, using the five military aspects of terrain, and assesses their impact on operations. The function of the terrain analysis is to reduce the uncertainties regarding the effects of natural and manmade terrain on friendly and enemy operations. The process of preparing the MCOO assists the engineer in analyzing the military aspects of the terrain. The engineer will assist the G/S-2 in developing the MCOO.

The second step of the EBA is to analyze the threat engineer mission and capabilities and the enemy's doctrinal use of engineers. To do this, the engineer and G/S-2 will use the guidance and templates described in chapter 2.

The third step of the EBA is to evaluate friendly engineer capabilities and their impact on mission accomplishment. The engineer officer evaluates the task organization to determine the engineer organization and assets available and considers the possibility of additional support from maneuver forces and other engineer forces.

Establishing Goals and Objectives

The commander's intent, goals, and objectives are important elements of the estimate process. The desired outcome of the mission will provide the staff with a defined focus required to develop and analyze a COA. The engineer staff will focus primarily on identifying, integrating, and coordinating engineer tasks in support of the mission.

Conceptualizing the Course of Action

The COA is actions envisioned to achieve the desired outcome. The EBA provides a reference for the engineer participation in the COA development. At a minimum, the engineer ensures that the G/S-3 understands the engineer task organization and available combat power. The engineer begins to develop a scheme of engineer operations to support the COA. The engineer's initial scheme is a rough draft and is refined during the wargaming process.

Detail the Course of Action

This phase includes *execution* planning—developing practical measures for carrying out the COA—and the engineer must be an active participant. For example, the engineer must wargame the timing aspects of situational obstacles, obscuring and suppressing for obstacle breaching, and the positioning of forces and material for current and future operations. The engineer must be ready to interject thoughts and identify critical events and tasks. The engineer identifies engineer tasks and determines if a task is feasible based on the assets available. Also, the engineer must articulate the actions of threat engineers during course of action development.

Evaluate the Course of Action

Based on the staff recommendation, the commander announces a decision and COA or intent. The type and amount of detail that the engineer provides depends on the needs and preferences of the commander, but generally include—

- Concept of engineer support.
- Engineer mission priorities.
- Critical engineer events and/or actions.
- Task organization and command and support relationships.
- Obstacle overlay (including SCATMINE employment authority and concept for use by system type).
- Survivability estimate and priority.
- Critical tasks directed to subordinate units.
- Engineer's work time line.

Issue the Order

Once the commander makes a decision, the estimate provides the bulk of the information needed to prepare the force's OPLAN or OPORD.

PLANNING DOCUMENTS

Blank forms of engineer documents are found in MCRP 3-17B. The basic forms and reports are—

- Engineer Breaching Plan. A plan in five-paragraph order format that directs task organization, states mission, articulates execution, coordinating instructions; and administrative and logistic requirements, and details the command and control of a specific breaching evolution. It is the commander's

breaching directive to subordinate organizations. The GCE engineer staff prepares the breaching plan in coordination with detailed and specific information provided by subordinate engineer commanders.

- Barrier Plan. The engineer staff prepares the barrier plan. The barrier plan is a series of obstacle zones designed to shape the movement of the enemy at the operational and strategic levels of war. Normally in five-paragraph order format, barrier plans identify supporting organizations, state the mission, articulate execution; coordinating instructions; and administrative and logistic requirements, and detail command and control procedures.
- Engineer Obstacle Plan. An obstacle plan is prepared when the use of obstacle groups is essential to MAGTF operations. Primarily implemented by the GCE commander, this plan must fall within the constraints of the MAGTF barrier plan. The obstacle plan is an annex to the operations appendix to the OPLAN. It details the information required to emplace and/or activate friendly obstacles. It should specifically address obstacle requirements in support of the withdrawal plan required when executing amphibious operations.
- Engineer Appendix to the Operations Annex to the OPLAN. The engineer appendix to the operations annex of the OPLAN is a supporting document covering the engineer organization, mission, concept of operations, administrative, logistic, and command and control information.
- Engineer Estimate. The engineer estimate is a planning document that serves as a basis for the submission of conclusions to the commander. It presents the specialized viewpoints of the staff engineer officer. The engineer staff provides analysis to the commander of the principal engineer factors governing the operation and the comparative courses of action identified.

(reverse blank)