

APPENDIX E

JOINT ENGINEER CAPABILITIES

FORCE-PROJECTION OPERATIONS

Army corps engineer commanders and their staffs operate jointly with Air Force, Navy and Marine Corps engineer forces during force-projection operations. It is critical that Army corps engineer forces fully understand a joint component's engineer capabilities so that they can integrate them into corps operational planning along with planning for Army corps engineer support to other joint headquarters. This appendix provides a brief description of the types of joint engineer units, their capabilities, and interoperability considerations. During all joint force-projection operations, the corps engineer ensures that adequate Army commu-

nications, logistics, and LO support are provided for supporting the Army engineer component to the joint engineer force. If shortfalls occur with availability of standard map products and map data, requirements are coordinated with joint topographic agencies, such as the Topographic Engineering Center (TEC) and the DMA Periodic joint engineer meetings assist in blending the joint engineer force towards accomplishing the numerous engineer missions required during force-projection operations.

US AIR FORCE ENGINEER SUPPORT

The US Air Force is challenged by a variety of threats throughout the world. As a result, it must be prepared to fight battles of great scope, range, and intensity. It must be prepared to counter large modern forces, as well as light forces, insurgents, and sophisticated terrorist groups wherever and whenever they threaten US interests. To meet this wide range of threats, the worldwide air base network must be capable of supporting the projection of air power. Air Force Regulation 93-3 states that combat air operations depend on adequately developed and supported bases. Bases must have adequate facilities and civil engineering resources to launch and recover mission aircraft, support high sortie generation rates, provide essential CS functions, and assist in defending against enemy attack.

CIVIL-ENGINEERING MISSION

The Air Force combat engineer's role is to ensure that the engineering-related aspects of air-base operations are responsive and effective. The following are basic wartime missions of Air Force engineers, as described in Department of Defense Directive (DODD) 1315.6:

- Ž Emergency repair of war damage (includes rapid runway repair (RRR), facility repair, and utility repair).
- Force bed down of Air Force units and weapons systems.
- Ž Operations and maintenance of Air Force facilities and installations.

Ž Crash rescue and fire suppression.

- Construction management
- Supply of material and equipment to perform the engineering mission.

To accomplish these missions, Air Force engineers are organized into three basic types of units with complementary wartime missions--RED HORSE units, Prime BEEF units, and Prime Readiness in Base Support (Prime RIBS) units. An engineering and services (E&S) force module combines Prime BEEF and Prime RIBS capabilities to support a flying squadron.

RED HORSE UNITS

RED HORSE civil-engineering squadrons are wartime-structured units that provide a heavier engineering capability than the civil engineering base Prime BEEF and Prime RIBS units. The RED HORSE squadrons have a regional responsibility; they are not tied to a specific weapons system and are not responsible for base operations and maintenance. They are mobile, rapidly deployable, and largely self-sufficient for limited periods of time. They perform the wartime tasks of major force bed down, heavy damage repair, bare base development, and heavy engineering operations. Due to their mission, they possess greater combat capability than the civil-engineering base units. RED HORSE was formed specifically to meet wartime needs. Its composition is based on wartime requirements; it is not assigned to an air base to perform peacetime operations and maintenance tasking. Its primary mission in peacetime is to train for wartime, and its squadrons represent the strongest combat engineer capability in the Air Force. As the lead joint engineer resource in any force-projection situation it is the most capable Air Force engineering unit when it comes to the initial wartime requirements affecting the launch, recovery and operation of Air Force combat aircraft. It is the engineer unit used by the theater or

JTF commander when incoming force flow is disrupted, resupply is interrupted, or launch and recovery activities at critical locations are stopped due to major airfield damage. RED HORSE squadrons are packaged to be available early in the time-phased deployment data flow, and they are dedicated to up-front engineer missions. They are assigned to employment locations that are critical to the success of the air war. Dividing responsibilities between Air Force engineering assets (RED HORSE, Prime BEEF, and Prime RIBS) is not attempted. RED HORSE units can perform all the engineering missions of the civil-engineering units with the exception of crash rescue and major fire suppression. The presence of Prime BEEF forces at an employment location does not exclude the employment of RED HORSE units.

RED HORSE units are theater Air Force assets with a regional responsibility. They report through theater or regional command channels, C2 of these units remains within numbered Air Force channels or a higher level if a numbered Air Force is not present (such as under the Air Force forces (AFFOR) commander of a JTF). A joint contingency wartime construction-management organization can also task RED HORSE units through the numbered Air Force for construction support. If two or more RED HORSE squadrons are in a region, an Air Force civil-engineering group will be formed with the numbered Air Force staff engineer serving as the group commander. Vehicles, heavy equipment and RRR sets capable of supporting full RED HORSE squadrons are pre-positioned in projected TOs to mitigate any delays in receiving strategic heavy lift. In addition to theater pre-positioned sets, RED HORSE squadrons maintain home mobility sets of similar equipment that are easily deployed and maintained. They form three types of RED HORSE (RH) deployment echelons with vehicle and equipment sets at strategic locations. They are maintained in a ready-to-go condition.

RH-1 Echelon

Critical to RED HORSE employment is the advance deployment of the RH-1 echelon. This element, tied to the appropriate theater air component commander, would deploy with the headquarters, prepare for the reception of follow-on RED HORSE elements, and prepare the advance plans for project execution. This echelon consists of a 16-person team that is deployable within 12 hours on a C-141. The team performs advanced airfield surveys, including evaluation of airfield pavements, the water supply utility systems, and existing facilities. It prepares a bed-down plan for the orderly establishment of an operator base at a force-projection location. The team also compiles facility and material requirements necessary to accomplish the force bed-down plan and accomplishes the site layout for later RH-2 force bed down.

RH-2 Echelon

The RH-2 echelon is a 93-person team with heavy equipment capable of deploying within 48 hours. The team performs land clearing, site stabilization, area drainage earthwork, and erection of relocatable structures essential for force bed down at an undeveloped location. The echelon performs RRR using organic equipment and repair materials (AM-2 mat, crushed stone, and so forth) that are pre-positioned or supplied by the support headquarters. The team also repairs bomb-damaged facilities and systems; installs, expands, and repairs essential utility systems; and provides initial civil-engineering support, including drilling and developing water wells for deploying forces.

RH-3 Echelon

The RH-3 echelon is a 295-person squadron with heavy equipment capable of deploying within 6 days. The squadron accomplishes heavy repair of bomb-damaged facilities and utility systems. The echelon erects temporary relocatable facility substitutes and installs or

expands essential utility systems, including airfield lighting, to support force bed down. The squadron operates mineral product plants (batch plants, crusher, and block plant), if required, when plant equipment is supplied from contingency or host stocks. The echelon performs explosive demolition operations as required and performs RRR using echelon-organic equipment. The squadron is able to repair two large and three small bomb craters in a 4-hour period. Standard engineering capabilities provided by RED HORSE squadrons include--

- Airfield lighting,
- Concrete operations,
- Ž Explosive demolition operations.
- Aircraft arresting systems,
- Ž Material testing.
- Ž Quarry operations.
- Ž RRR.
- Revetment construction.
- Ž Water well drilling.
- Mobile facility asset siting, erection, and installation.
- Ž Fuel systems.
- Ž Facility hardening.
- Expedient pavement expansion.
- Utility-system repair.
- Ž Force bed down.
- Heavy earthwork.
- Road construction.

- Power generation.
- Restoring chemically protected facilities.
- Engineering design.
- Base denial operations using fire, explosives, component removal, equipment sabotage, and mechanical destruction.
- Disaster relief and preparedness.

Ž Defensive operations.

Ž C2 over the following:

- Full-squadron deployment to one location.
- Full-squadron deployment with phased arrival to one location.
- Squadron deployment to multiple locations (split unit).
- In-transit operations during deployment.
- Work party and convoy operations.

RED HORSE squadrons accomplish major airfield construction and repair work in forward locations requiring an organic logistics capability, including vehicle maintenance, food service, supply, and logistics plans. A 60-day war readiness spares kit (WRSK) keeps these units operational until normal supply channels open.

PRIME BEEF UNITS

All Prime BEEF forces are CS forces that are generally configured as squadrons and teams. Their mission is to provide CS to the air combat forces which are, or may become, a part of a theater, command, or task force formed for combat operations. These civil-engineering base units are organic at essentially all major

CONUS and overseas Air Force bases in order to provide peacetime real-property maintenance capability. This capability is totally integrated into the peacetime force structure and provides the operational commander with the flexibility of employing weapons systems without depending on others. A similar organic civil-engineering capability in the form of Prime BEEF CS forces will accompany deploying flying squadrons when they go to war. These deploying flying units will have the organic Prime BEEF CS engineering support capable of performing those engineering wartime tasks necessary for sortie generation. Specific Prime BEEF CS units will be linked to specific flying units. Prime BEEF CS units concentrate primarily in supporting aircraft weapons systems and combat operations. There are two basic Prime BEEF mobile force classifications: large CS squadrons and small specialty CS teams. Prime BEEF CS units have no organic heavy equipment--only toolboxes and small team kits (such as power tools). They require base operating support and most deploy in 50- or 100-person team increments.

Large-Scale Prime BEEF CS squadrons

The large CS squadrons provide basic skills to establish base civil engineer (BCE) operations or in accomplish the most critical wartime tasks at locations where additional assistance is required or where none exists. Eight types of large-scale CS squadrons are available in four separate and distinct sizes (200-, 150-100-, and 50-person). These types of squadrons are active duty, Air National Guard (ANG), or Air Force Reserve. They are capable of deploying on a 22- to 28-hour notice to support aircraft operations at main operating bases (MOBs), collocated operating bases (COBs), standby bases (SBs), forward operating locations (FOLs), aerial ports of debarkation (APODs), and bare bases (BBs). These squadrons can fully support AM-2 matting, fiberglass matting and concrete slab RRR methods. These squadrons can support a bed-down population of 2,200 to 2,500 personnel. Combi-

nations of the eight types of CS squadrons are used to support theater requirements.

Small Specialty Prime BEEF CS Teams

Small specialty CS teams are comprised of certain skills and numbers, such as fire fighters, construction management, and staff augmentation necessary to fill known requirements. Nine types of teams are available, ranging in size from 3 to 48 persons from all components. The size and composition of all Prime BEEF mobile teams is based on METT-T.

PRIME RIBS UNITS

Prime RIBS units are worldwide combat morale, welfare, recreation, and services (MWRS) forces organized and trained for wartime support. The Prime RIBS program organizes forces capable of deploying on a 22- to 28-hour notice to support global or major regional conflict operations on MOBS, COBS, FOLs, APODs, aerial ports of embarkation (APOEs), and BBs or to support essential MWRS missions at critical CONUS bases. Each Prime RIBS element is capable of providing initial food service, billeting, recreation programs, and mortuary-operations support for a population of up to 1,200 people. It can also support an independent or dependent combat aviation squadron of 16 to 24 fighter aircraft or a significant aviation deployment less than squadron size in a major deterrent force posture. With additional augmentation, Prime RIBS units can support organizational field laundry operations, personnel fitness programs, and tactical field exchange resale operations.

ENGINEERING AND SERVICES FORCE MODULE

An E&S force module is married to deploying aircraft to the greatest extent possible. The overall objective is to have Prime BEEF CS and Prime RIBS squadrons and teams inextricably bonded to a deploying flying squadron. When a specific Prime BEEF or Prime RIBS CS squadron or team is tied to the home sta-

tion or other deploying aircraft, that CS squadron or team will be tasked to accompany its flying squadron to the wartime location--regardless of the degree of wartime host-nation support in theater. If a CS squadron or team is not tied to the home station or other deploying aircraft and assured host-nation support is available, the CS squadron or team may be reapportioned to some other wartime location. The basic E&S module consists of 282 people from a 200-person Prime BEEF CS engineering force package, a 48-person Prime BEEF CS fire-fighter force package, and a 34-person Prime RIBS CS force package.

ARMY-AIR FORCE JOINT ENGINEER CONSIDERATIONS

During force-projection operations, the initial US Air Force engineering capability available in theater will most probably be Air Force RED HORSE elements establishing APODs. Prime BEEF and Prime RIBS units will also be quickly deployed to force-projection theater locations to operate at major air bases. The corps engineer and his staff should consider the following when coordinating joint engineer plans and operations with the Air Force:

- Ž Request the latest engineer intelligence data from deployed or deploying RED HORSE elements to assist in identifying force-projection TA engineer requirements (including soils data, availability of construction materials, and host-nation construction support) and enemy engineer capabilities.
- Ž Establish engineer staff links between the AFFOR and ARFOR engineer staff sections through the JTF or theater engineer staff and headquarters.
 - Provide necessary Army engineer LO support.
- Ž Develop the joint task-organization relationships that enhance RED HORSE and Prime BEEF capabilities following

deployment of Army corps engineer units.

- Assess the need for RED HORSE airfield maintenance and repair support following arrival of Army construction units in theater.

Ž Determine if Prime BEEF units need augmentation from Army construction units, especially in the area of RRR.

US NAVY ENGINEER SUPPORT

The Naval Construction Force (NCF) is a generic term applied to that group of deployable naval units that has the capability to construct maintain, and/or operate shore, inshore, and deep-ocean facilities in support of US Navy and Marine Corps and, when directed, other agencies of the US government, including the US Army and unified commanders. The NCF is frequently referred to as the *Seabees*. It is composed of both active and reserve component units.

Air-transportable, task-organized NCF units are available for deployment upon 48-hours notice. Priority construction projects can be initiated days prior to the arrival of maritime prepositioning force (MPF) shipping. Additionally local contractual acquisition of heavy engineer equipment can augment air-transported NCF assets in a secure environment The NCF provides-

- Ž Responsive military advanced base-construction support, including operational, logistics, underwater, ship-to-shore, shore, and deep-ocean facilities construction, maintenance, and operation.
- Military construction support of Marine Air-Ground Task Force (MAGTF) operations.
- Defensive and limited offensive operations against overt or clandestine enemy attacks directed toward unit personnel, convoys, camps, and facilities under construction.

- Amphibious assault and ship-to-shore construction support operations.

- Battle-damage repair operations.

Ž Disaster control and recovery operations.

- Civic-action employment.

NAVAL BASE CONSTRUCTION

The construction of naval bases maybe considered as falling into two areas: those within the country of conflict and those off the shores of the country in which combat is underway In-country bases include logistics terminal facilities; coastal, inshore, and riverine warfare operating bases; communications facilities; ashore fleet air units; and other fleet support facilities in the immediate conflict area. Naval air units ashore, such as search-and-rescue, antisubmarine warfare, carrier on-board delivery, electronic countermeasures, coastal and riverine patrol, communication, and tactical squadrons have significant construction implications. Naval offshore bases are required to support antisubmarine warfare, mine warfare, reconnaissance, communications, underway replenishment, and logistics support to forward-deployed Naval and Marine forces.

SUPPORT TO THE US MARINE CORPS

The MAGTF is the major combat organization supported by the NCF. It normally consists of a MAGTF command element, a ground combat element, an aviation combat element, and a

CSS element. OPCON is the only command or support relationship appropriate and authorized when employing NCF units within the MAGTF. The MAGTF commander may place NCF units under the OPCON of a subordinate element commander (such as a ground combat element) for missions such as RRR or civil-action team support required to assist stability operations. NCF units employed under the OPCON of the MAGTF element commander will be tasked according to MAGTF construction priorities.

The normal MAGTF/NCF associations established to support MAGTF operations are general guidelines; the actual NCF organizational relationship with the MAGTF is METT-T dependent. These associations are-

- Ž A marine expeditionary force (MEF) with a naval construction regiment (NCR) within 30 days.
- A marine expeditionary brigade (MEB) with an NMCB within 6 days.
- Ž A marine expeditionary unit (MEU) with an NMCB detachment (air detachment, civic-action teams, and other details and detachments as directed by the fleet CINC) within 48 hours.

The MAGTF's general engineering requirements will normally determine the scope of NCF employment during any operation. NCF units focus on general engineering tasks and are limited by training and equipment in combat and CS capabilities. Prior to assigning a mission to an NCF unit a thorough analysis should be conducted to determine if all aspects of the assignment fall within the NCF's capabilities. NCF units should receive specific tasks or types of tasks on an area or GS basis. The NCF is a construction organization. It has organic defensive capability, but does not possess the offensive combat capability of Marine Corps engineer units. The construction capabilities provided to the MAGTF by NCF units are extensive. They include the following:

- Constructing of ASPs, expeditionary bulk-liquid storage facilities, battle-damage repair (including RRR), expeditionary shelters for operations, communications, maintenance, warehousing, and personnel support structures.
- Erecting of combat-zone hospitals.
- Improving or constructing ports.
- Ž Security fencing.
- Ž Well drilling.
- Ž Expanding and upgrading unimproved roadway systems.
- Ž Developing aviation support facilities and other forward operating bases in support of Marine aviation employment through extensive use of expeditionary airfield matting, pre-engineered and expeditionary shelters, and other semipermanent and permanent construction support.
- Ž Hardening POL and ammunition storage facilities against natural and enemy threats.
- Installing permanent (nonstandard) bridges in relief of tactical, fixed-panel bridging assets.

In executing assigned projects, NCF units maintain a significant self-defense capability for their construction sites and can be employed as part of a perimeter defense force. All Seabee units are equipped with small arms, and the larger units (NMCBs) have organic indirect-fire weapons systems (60-millimeter mortars). Their weapons are identical to those in the Marine Corps inventory. A Marine advisor is resident to the NMCB staff and NMCB personnel receive semiannual training on military skills and tactics.

AMPHIBIOUS OPERATIONS

All component NCF organizations may be employed during amphibious operations. NCF forces are normally placed OPCON to the Commander, Amphibious Task Force (CATF). They perform construction tasks that assist in the ship-in-shore movement of personnel, equipment and supplies. NCF units OPCON to the MAGTF commander may be located in both the assault echelon (AE) and the assault follow-on echelon (AFOE). The priority given to construction tasks assigned to NCF units will determine the echelon in which the NCF will be employed. Additional NCF units may be assigned to the CATF and employed within the amphibious objective area (AOA) in a fleet support or other role. Examples of tasks requiring immediate priority include well drilling and establishing or upgrading forward operating bases for fixed-wing aircraft.

SUPPORT TO THE MARITIME PRE-POSITIONING FORCE

The MPF is a task organization of units under one commander formed for the purpose of introducing an MEB and its associated equipment and supplies into a secure area. The MPF is composed of a command element, a maritime pre-positioning ships squadron, an MEB, and a naval support element (NSE). As part of their primary mission, NCF units construct and repair MPF logistics terminal facilities. Specific areas of emphasis include beaches, ports, the arrival airfield, and railheads.

Beaches

Unlike amphibious operations, logistics considerations drive beach selection for MPF operations. NCF units can rapidly perform the following tasks:

- Ž Upgrade beach egress and road networks to staging and marshaling areas and other inland destinations.

- Construct expedient survivability structures (earthen berms) for bulk liquids and Class V ammunition storage.

Ports

NCF units can evaluate port capabilities (surface and subsurface) and upgrade facilities to support the MPF operation.

Arrival Airfield

NCF enhancements include—

- Ž Analyzing soil and construction materials, to include evaluating the load-bearing capability of select fill material.
- Constructing and upgrading airfields to ensure their capability for tactical or strategic lift (C-130/C-141/B-747/C-17/C-5) aircraft.
- Increasing aircraft staging areas (maximum on ground (MOG)) sufficient for tactical and strategic aircraft requirements.
- Ž Upgrading roadway systems.
- Ž Constructing expedient survivability structures (such as earthen berms and revetments) for aircraft, bulk liquids, and Class V ammunition storage and hardening existing facilities.
- Ž Arresting gear site preoperation/installation.
- Ž Constructing and improving airfield utilities.

Rail heads

NCF tasks include—

- Damage control and repair.
- Railhead operations.

NAVAL BASE MAINTENANCE

The tasks of the NCF in support of naval base maintenance include the operation and maintenance of public works and public utilities such as water purification and distribution, power generation and distribution, and sewage collection and treatment. Once the base has been substantially constructed, the NCF provides maintenance and repair of structures, minor construction for alterations and improvements, and maintenance and upgrade of LOC.

DISASTER RELIEF

NCF forces maintain the capability to provide disaster relief in the event of a natural disaster or hostile military action. Each NCF unit is responsible for disaster control measures to protect its own personnel equipment life-support areas, and work sites. They may be assigned responsibility for participation in the defense of other activities. The NCF unit makes this an effective disaster control and recovery unit (DCRU), ready to give direct assistance to any military or civilian installation or community during an emergency.

CIVIC ACTION

Civic-action projects in support of the local populace may be undertaken by NCF units as part of their normal operations.

NAVAL CONSTRUCTION FORCES

NCF units are commanded by officers of the Navy Civil Engineer Corps. Enlisted personnel are primarily from the naval occupational field 13 (construction). Occupational field 13 has builders, construction electricians, construction mechanics, engineering aids, equipment operators, steelworkers, and utility workers.

Commander, Naval Construction Battalions

The commander, Naval Construction Battalions, US Pacific Fleet (COMCBPAC) and the

Commander, Naval Construction Battalions, US Atlantic Fleet (COMCBLANT) exercise operational and administrative control of assigned NCF components. They provide policy guidance concerning leadership and discipline; administration; force-projection planning; readiness; military and technical training, unit employment deployment and scheduling; doctrine, tactics, and procedures; equipment management and logistics support.

Naval Construction Brigade

A naval construction brigade (NCB) exercises administrative and operational control of two or more NCRs operating in a specific geographic area or in support of a specific military operation. The NCB provides an initial review of plans, programs, and construction capabilities; assigns priorities and deadlines; and directs distribution of units or materials and equipment

Naval Construction Regiment

An NCR exercises administrative and operational control of two or more NMCBs operating in a specific geographic area or in support of a specific military operation. The NCR may be OPCON to an MEF. The NCR develops construction execution plans; assigns construction projects to NCR units; monitors progress; performs quality control; directs redistribution of units, equipment and materials; and reviews plans and operations reports. The NCR also maintains a greater planning, estimating, and engineering capability than the battalions.

Naval Construction Force Support Unit

A naval construction force support unit (NCFSU) provides operational construction logistics support to the deployment area for an NCR of up to four NMCBs. The NCFSU controls the requisition, expedition, receipt, control, issue, and delivery of construction (Class IV) materials. It also provides maintenance support for NCF auxiliary construction and transportation equipment and performs over-

haul and specialized repair of equipment components. When required, the NCFSU provides the operation and maintenance capability for rock crushers, asphalt and concrete plants, large paving machines, and long-haul transportation.

Naval Mobile Construction Battalion

A NMCB provides responsive military construction support to Naval, Marine Corps, and other military forces, conducts battle-damage repair operations (including RRR), constructs base facilities, and conducts defensive operations as required by METT-T. The NMCBs also conduct disaster-relief operations and civic-action projects as required. The most common tasks of the NMCB are to—

- Construct, repair, improve, and maintain LOC (including bridges, road, and rail systems).
- Construct, repair, improve, and maintain fixed- and rotary-wing airfields, landing sites, airdrop sites, and airfield support structures/facilities.
- Upgrade, repair, and replace POL and bulk-liquid systems.
- Construct ASPS, water storage and distribution facilities, cantonments, defensive structures, throughput systems (air, rail, road, and water terminals), and other support facilities.

The NMCB can function as an integral unit of the NCR or it can operate independently. It provides specialized, task-organized detachments up to one-half its organizational size to address specific support requirements. Eighty-five percent of each NMCB can deploy as an air echelon via aircraft (approximately 87 C-141 equivalents), with the remaining fifteen percent following via surface transportation.

NMCB Air Detachment

An air detachment (AIR DET) is a task-organized advanced element of an NMCB. It is composed of 91 personnel and 38 items of civil-engineer support equipment and limited to 250-300 STONs (14 C-141 equivalents) of air shipment. The AIR DET is used to repair immediate war damage and construct urgent projects required by major operational plans.

NMCB Civic-Action Team (Seabee Team)

The civic-action Seabee team is a small, highly-mobile construction unit, task-organized from NMCB assets. The civic-action team provides socioeconomic community development disaster relief, and technical assistance. The team supervises nation-assistance construction projects and conducts on-the-job training and classroom instruction in third-world nations.

Amphibious Construction Battalion

An amphibious construction battalion (PHIBCB) provides engineering support to the naval beach group (NBG) during the initial assault-and-landing phase of amphibious operations. The PHIBCB provides designated elements to the CATF, supports the NBG, and assists the landing-force support party (LFSP) or NSE in operations that do not interfere with the primary mission. There are two PHIBCBs, one each under the OPCON of the Commander in Chief, Pacific Fleet (CINCPACFLT) and Commander in Chief, Atlantic Fleet (CINCLANTFLT). They are readily organized to support specific tasks. When employed in support of amphibious operations, they become essential elements of the NBG, the naval component of the LFSP. A PHIBCB supports a MAGTF landing over two beaches during the amphibious assault. PHIBCBs maintain organizational command integrity.

Construction Battalion Maintenance Unit

A construction battalion maintenance unit (CBMU) maintains, operates, and repairs public works, utilities, and other facilities at an

established advance base after the departure of the NMCB units that started the construction. The unit may be attached to the NMCB to assist in completing the facilities that the CBMU will subsequently operate and maintain. When employed, CBMUs carry out their assigned functions under the command of the advanced base commander or naval component commander. Typical CBMU functions include—

- Ž Designated public works responsibilities at a naval or marine base or other installations.
- Maintenance, repair, and minor construction for structures and grounds, including waterfront facilities, runways, taxiways, parking aprons, and helicopter pads (including matting surfaces).
- Ž Operation and maintenance of base utilities systems, except expeditionary systems such as the Amphibious Assault Fuel System (AAFS), Tactical Airfield Fuel Distribution System (TAFDS), and water-supply support system equipment.
- Engineering services for the base as requested.

Underwater Construction Team

An underwater construction team (UCT) constructs, inspects, maintains, and repairs underwater facilities. Generally, all underwater engineering, construction and repair falls under the purview of an UCT. Each UCT is organized and equipped to be self-sufficient in underwater construction capability for the various tasks anticipated. Their outfitting includes construction and underwater weight-handling equipment underwater and terrestrial construction tools, diving equipment, safety equipment and a standard allowance of infantry gear. The UCT can deploy as an integral unit or as individual construction detach-

ments in support of other NCF, MPF, MAGTF, or naval units. Tasks include support of underwater surveillance systems and waterfront facilities inspections.

Construction Battalion Unit

A construction battalion unit (CBU) provides engineering support of a nature that does not lend itself to accomplishment by other NCF units. The CBUs are also used to provide manpower pools in support of NMCBs and naval fleet hospitals.

ARMY-NAVY JOINT ENGINEER CONSIDERATIONS

During force-projection operations, the initial naval engineering capability available in theater will most probably be NMCB AIR DETs, and MAGTF amphibious forces. NMCBs will also be quickly deployed to force-projection theater locations to construct necessary naval facilities. The corps engineer and his staff should consider the following when coordinating joint engineer plans and operations with the Navy:

- Ž Request the latest engineer intelligence data from deployed or deploying NMCB AIR DET elements to assist in identifying force-projection TA engineer requirements (including soils data, availability of construction materials, and host-nation construction support) and enemy engineer capabilities.
- Establish engineer staff links between the Navy forces (NAVFOR) and ARFOR engineer staff sections through the JTF or theater engineer staff and headquarters.
- Ž Provide necessary Army engineer LO support.
- Develop the joint task-organization relationships that enhance NCR capabilities following deployment of Army corps engineer units.

- Assess the need for NMCB support following the arrival of Army construction units in theater.
 - Develop procedures for Army engineer units to be able to acquire additional Class IV construction materials from NCFSUs.
- Ž Determine if NMCB units need augmentation from Army construction units.

US MARINE CORPS ENGINEER SUPPORT

The Marine Corps is organized into regiments, each of which contains a division, an aircraft wing, and a force service support group (FSSG). These, in turn, each contain organic engineer support. The Marine Corps component of the theater command or JTF is normally controlled by a commander of Marine Corps Forces (MARFOR). The regiment forms MAGTFs to meet force-projection operations. Components of a MAGTF may include an MEF, an MEB, and an MEU.

MARINE AIR-GROUND TASK FORCE

The Marine regiment may form a MAGTF that is a task organization of Marine forces (division, aircraft wing, and service-support groups) under a single command and structured to accomplish a specific mission. NCF units may be placed under OPCON to the MAGTF commander, who may place NCF units under the OPCON of a subordinate element commander (such as a ground combat element) for missions such as RRR or civil-action team support required to assist stability operations. NCF units employed under the OPCON of the MAGTF element commander will be tasked according to MAGTF construction priorities. The MAGTF normally consists of command, aviation combat ground combat and CSS elements.

Command Element

The command element is the MAGTF headquarters. It is a permanent organization composed of the commander; general or executive and special staff sections; headquarters section; and requisite command, control, and coordination staff essential for effective planning and execution of operations by the other three elements of the MAGTF.

Aviation Combat Element

The aviation combat element is task-organized to provide all or a portion of the functions of Marine Corps aviation in varying degrees, based on the tactical situation and the MAGTF mission, and size. These functions are air reconnaissance, anti-air warfare, and control of aircraft and missiles. The aviation combat element is organized around an aviation headquarters and varies in size from a reinforced helicopter squadron to one or more Marine aircraft wings. It includes those aviation command (including air-control agencies), combat, CS, and CSS units required by the situation. Normally there is only one aviation combat element in a MAGTF.

Ground Combat Element

The ground combat element is task-organized to conduct ground operations. It is constructed around an infantry unit and varies in size from a reinforced infantry battalion to one or more reinforced Marine divisions. It also includes appropriate CS and CSS units. Normally, there is only one ground combat element in a MAGTF.

CSS Element

The CSS element is task-organized to provide the full range of CSS necessary to accomplish the MAGTF mission. This element can provide supply, maintenance, transportation, deliberate engineer, health, postal, disbursing EPW,

automated information systems, exchange, utilities, legal, and mortuary services. The CSS element varies in size from an MEU service-support group to an FSSG. Normally there is only one CSS element in the MAGTF.

MARINE EXPEDITIONARY FORCE

An MEF is the largest of the MAGTFs, normally built around a division or wing team, but it can include several divisions and aircraft wings, together with appropriate CSS organizations. The MEF is capable of conducting a wide RANGE of amphibious assault operations and sustained operations ashore. It can be tailored for a wide variety of combat missions in any geographic environment.

MARINE EXPEDITIONARY BRIGADE

An MEB is a task-organized organization normally built around a Marine regimental landing team, a provisional Marine aircraft group, and a logistics support group. It is capable of conducting amphibious assault operations of a limited scope. During potential crisis situations, an MEB may be forward-deployed afloat for an extended period in order to provide an immediate combat response.

MARINE EXPEDITIONARY UNIT

An MEU is a task organization normally built around a battalion landing team, a reinforced helicopter squadron, and a logistics-support unit. The MEU fulfills routine afloat-deployment requirements, provides an immediate reaction capability for crisis situations, and is capable of relatively limited combat.

MARINE COMBAT ENGINEER BATTALION

Each Marine division is supported by one CEB that will provide close CS and limited general engineering support for the division through task-organized combat engineer elements for ground combat operations. Each Marine infantry regiment (three per division) is supported by a combat engineer company. The CEB enhances the mobility counter-mobility,

and survivability of the Marine division through close combat engineer support and provides limited general engineering support required for the functioning of the Marine division. The CEB has the following capabilities:

Ž Mobility tasks.

- Conducts engineer reconnaissance and supports intelligence collection within the division zone.
- Plans, organizes, and coordinates the assault breaching of explosive and nonexplosive obstacles from the high-water mark inland.
- Employs assault bridge systems. When augmented, employs other standard bridge systems.
- Provides expedient repair and reinforcement of existing bridges.
- Constructs expedient, short-span bridges from local materials in support of ground combat operations.
- Provides temporary repair of existing roads and limited new construction of combat roads and trails.

Ž Countermobility tasks.

- Plans, organizes, and coordinates the construction of simple and compound explosive and nonexplosive obstacle systems.
- Plans and constructs obstacles requiring special engineer equipment or technical skills.
- Performs specialized demolition missions beyond the capability of other division units.
- Survivability tasks. Provides technical assistance and necessary equipment for

the development of temporary protective positions for personnel and equipment.

- General engineering support tasks.
 - Provides essential construction support that is temporary in nature and designed to meet minimum combat requirements.
 - Provides utility support including mobile electric power equipment and potable water for essential troop consumption, bath services, and equipment operation and maintenance requirements.
 - Constructs and improves expedient vertical takeoff and landing (VTOL) sites to support division operations.

The CEB consists of a Headquarters and Service (H&S) company, an engineer support company (ESC), and four combat engineer companies (CECs). The CEC provides close combat support of an engineering nature, as necessary, to meet the essential requirements of an infantry regiment and other division elements in combat operations. It contains a company headquarters and three combat engineer platoons. The ESC provides personnel, equipment, and appropriate task units to the CECs in support of operational requirements. It provides minimum potable water for the Marine division and electrical power for designated elements of the Marine division. The ESC is organized into a company headquarters section, an equipment platoon, a motor transport platoon, and a utilities platoon. The Marine engineer forces are currently undergoing some organizational changes. The CEB will lose its support company and one CEC to the ESB in the FSSG.

MARINE ENGINEER OPERATIONS DIVISION

Each Marine aviation wing contains a wing support group, which in turn contains wing support squadrons for both fixed- and rotary-wing aircraft. These squadrons each contain an engineer operations division which provides organic engineer support to the wing only and deploys with the wing. The division will not normally assist in other engineer operations. It provides all essential aviation ground support requirements and have the capability to perform—

- Engineer reconnaissance and survey.
- Repair, improvement, and maintenance of existing road nets.
- Ž Construction and maintenance of expedient roads and drainage systems.
- Ž Construction and maintenance of VTOL facilities.
- Ž Construction and maintenance of mission-essential base-camp requirements.
- Ž Technical and equipment assistance for erection of shelters.
- Ž Utilities support, to include essential mobile electric power, water, and hygiene support.
- Equipment and personnel required for RRR.
- Ž Material handling equipment (including 16 cranes and 31 forklifts) to support base operations.
- Limited mine-detection capability and combat engineering services.

An engineer operations division is task-organized into seven separate branches: draft/survey, heavy equipment/material handling, utilities, electrical, reference, water-support hygiene, and construction.

MARINE ENGINEER SUPPORT BATTALION

Each FSSG has an organic ESB. The ESB is organized to plan, coordinate, and supervise the battalion's general-engineering and supply-support functions. It is structured to facilitate task organization for operations conducted by the battalion. The ESB provides GS to the MEF (to include survivability countermobility, and mobility enhancements, and EOD) and GS to the handling, storage, and distribution of bulk Class I (water) and bulk Class III supplies. The ESB is capable of—

- Conducting engineer reconnaissance.
- Ž Constructing, improving, and maintaining airfields, encampments, and other support facilities.
- Ž Conducting mobility enhancement operations, iton include the construction, improvement, and maintenance of LOC and MSRs.
- Providing bulk Class III fuel support, to include receipt, storage, and distribution of bulk fuel products.
- Ž Providing utilities support, to include mobile electric power beyond supported units' capabilities and electrical power distribution within camps and support areas.
- Providing water purification and bulk Class I (water) storage and distribution.
- Ž Providing survivability enhancements, to include construction of protective structures.
- Installing or supervising the installation of standard and nonstandard fixed-panel and floating bridging, to include planning and controlling bridging operations.

- Ž Providing bath and laundry services.
- Ž Providing EOD support.
- Ž Constructing field-expedient deception devices.
- Ž Conducting countermobility operations through the installation of obstacles, to include minefield and nonexplosive obstacles.
- Ž Conducting mobility operations, to include breaching, reducing, and removing explosive or nonexplosive obstacles.
- Ž Providing specialized demolition operations.

The ESB is structured into seven separate companies to facilitate task organization an H&S company a bridge company an ESC, a bulk fuel company and three engineer companies, The H&S company provides C2, administrative, and CS functions for the rest of the battalion. This company also provides extensive EOD support to the MEF with a separate EOD platoon. The ESC provides DS maintenance for specified equipment organic to the battalion; DS transportation and services to the battalion; and GS or reinforcing augmentation, as required, to the engineer companies of the battalion. This is a large company organized into five separate platoons: utilities, maintenance, motor transport, engineer equipment, and water supply The bridge company provides technical assistance and supervision for the construction of find-panel and floating bridge equipment, Organic equipment includes nine bridge erection boats, three M4T6 sets, six floating foot bridges, and six MGB sets. The bulk fuel company provides general Class III supply support to the MEF. The engineer companies provide general engineering support of a deliberate NATURE to the MEF. It is organized into a headquarters section, an equipment platoon, and two engineer platoons.

ARMY-MARINE CORPS JOINT ENGINEER CONSIDERATIONS

During force-projection operations, the initial US Marine Corps engineering capability available in theater will most probably be Marine Division CEBs as part of MAGTF operations. ESBs will also be quickly deployed to force-projection theater locations to construct necessary Marine facilities. The corps engineer and his staff should consider the following when coordinating joint engineer plans and operations with the Marine Corps:

- Ž Request the latest engineer intelligence data from deployed or deploying Marine CEB and ESB elements to assist in the identification of force-projection TA engineer requirements, including threat engineer capability, mine and obstacle data, soils data, and availability of construction materials and host-nation construction support.
- Establish engineer staff links between the MAGTF, MARFOR, and ARFOR engineer staff sections through the JTF or

the theater engineer staff and headquarters.

- Ž Provide necessary Army engineer LO support.
 - Develop the joint task-organization relationships that enhance Marine engineer capabilities following deployment of Army corps engineer units.
 - Assess the need for CEB and ESB support following the arrival of Army corps combat engineer and construction units in theater.
 - Determine if ESB units need augmentation from Army construction units.
- Ž Develop procedures for Army engineer units to be able acquire additional Class IV construction materials from ESBs.
 - Coordinate requirements and support as the situation dictates (such as when Army units supporting a JTF with a large Marine contingent, including a Marine topographic platoon, are present).