Chapter 2. Functions

The 14 AGS functions are divided into airfield and air base support.

AIRFIELD SUPPORT

Airfield support functions are those activities and tasks necessary to establish and operate the flight line at an FOB. The five airfield support functions are—

- Weather services.
- EAF services.
- ARFF.
- Aviation and ground refueling.
- EOD.

The MWSS airfield operations division provides the preponderance of airfield support functions. At established airfields and FOBs, airfield operations division provides the technical expertise, equipment, and personnel necessary to operate the flight line (e.g., emergency response, aircraft arrestment, aviation refueling, EOD response, managing flight line hours, lighting and marking, establishing parking).

Although air traffic control is important to the operation of an airfield, the Marine air traffic control (MATC) detachment does not fall under the airfield operations division. MATC falls directly under the operational control of the tactical air command center (TACC). Figure 2-1 on page 2-2 shows the organization of the airfield operations division.
Photo Services

Although not identified as one of the five airfield support functions, the photo branch within the MWSS is a viable entity of the airfield operations division. The photo branch is primarily used to provide photographic records of incidents occurring at the airfield or FOB. The photo branch also assists the MWSS by providing photographic support for site surveys and construction projects.

Weather Services

The ACE requires current, precise weather information and forecasts over a large area for operational planning, execution, and flight safety. The ACE is concerned with weather conditions at widely dispersed FOBs, weather conditions en route to destinations and targets, and conditions at arrival airfields. Each MWSS possesses two weather support units: the weather services branch and the Marine expeditionary force (MEF) weather support team (MST).

Weather Services Branch

The weather services branch is manned, equipped, and tasked to provide continuous collection, processing, production, and dissemination of weather data, forecasts, and tactical decision aids for ACE operations. It is the primary source for meteorological and oceanographic (METOC) information for the MAGTF. Chief of Naval Operations
Instruction (OPNAVINST) 3710.7, *NATOPS General Flight and Operating Instructions*, provides aviation requirements for flight weather briefings. MCWP 3-35.7, *MAGTF Meteorological and Oceanographic Support*, provides the information needed for the commander to understand, plan, and conduct MAGTF METOC operations.

The weather services branch provides essential data for electronic warfare, aircraft target acquisition, and engagement while simultaneously providing theater and worldwide weather capabilities to the MAGTF. This branch also provides vapor/liquid/solid tracking forecasts to assist in NBC defense preparation and operations. MWSSs equipped with meteorological mobile facility (replacement) (MetMF [R]) will support aviation operations at FOBs. The MetMF (R) communication subsystem has the capability to read the Navy’s fleet multichannel broadcast to receive METOC data. Dissemination of METOC products to the MAGTF requires command, control, communications, computers, and intelligence local area network (LAN), wide area network (WAN), and SECRET internet protocol router network (SIPRNET). The MetMF (R) can operate semi-autonomously or as part of a weather network. Maintenance and supply of the weather equipment are performed by the supporting MALS.

To facilitate the safe operation of aircraft at an FOB, the weather services branch provides—

- A continuous surface weather observation program.
- Upper atmospheric soundings.
- Terminal aerodrome forecasts for the airfield and local area (5 nautical mile radius).
- Local area severe weather warnings and advisories.
- Climatological, astronomical, and tidal data.
- Sea and surf conditions.
Aviation weather briefs required by the current edition of OPNAVINST 3710.7.

Electro-optic tactical decision aids for mission planning and weapons system optimization.

Electromagnetic-effects products (e.g., electro-optical tactical decision aid) for mission planning and optimization of electronic warfare support, electronic attack, and electronic protection.

Target area, ingress/egress, mission, and staff weather briefings.

Pilot-to-meteorological services on authorized radio frequencies.

Staff weather briefings, a vital part of the intelligence preparation of the battlespace, to identify the impact weather will have on planned operations.

The weather services branch provides situational parameters and forecast products for assessing impacts on friendly and enemy capabilities. Littoral operations require continuous assessment of mesoscale features in dynamic land/sea interface. Mission success, in part, depends on the commander’s ability to evaluate METOC impacts on battlefield operations, personnel, power projection, weapons selection, and electromagnetic and electro-optical systems. Diurnal (daily) changes as well as synoptic (overall) weather features affect friendly and enemy maneuver, engagement, and communications.

**Marine Expeditionary Force Weather Support Team**

The MST provides direct, tactical METOC support to MAGTF command elements, other than the ACE.

**Expeditionary Airfield Services**

The EAF is a shore-based aviation support system that permits landing force aircraft to operate from FOBs within effective range of ground forces. EAF is a construction concept used to develop or enhance
FOBs and should not be confused with a concept of employment for Marine aviation. Although an FOB may be a simple grass landing zone (LZ) supporting helicopter operations, the installation and use of one or more EAF subsystems (e.g., fresnel lens, airfield lighting) will add versatility and durability to the site selected.

The EAF goal is to provide the ACE commander with flexible, rapidly deployable, self-sustaining, and survivable forward bases to support the ACE during expeditionary operations. Prior to selecting an FOB site, ACE and AGS planners should consider the availability and use of host nation (HN) airfields, abandoned or captured airfields, highways, and parking lots before constructing an EAF. EAF equipment is designed to provide the MAGTF commander with maximum flexibility and ability to plan, deploy, and operate. Primarily suited for short-term deployments, EAF equipment can be used to support extended operations. The Marine Corps defines expeditionary in terms of mindset, equipment, organization, and employment. The definition of expeditionary airfield includes the use of a variety of semi-prepared runways, with or without the employment of AM-2 matting.

EAF expertise is resident within the MWSG, and the use of aircraft recovery equipment requires extensive formal training. EAF expertise is also essential in supporting EAF installation and operations; EAF-specific survey, liaison, reconnaissance party (SLRP) tasks; survey airfield construction; and air base ground defense. EAF personnel and equipment require Naval Air Systems Command (NAVAIR) compliance, Marine Corps forces certification, naval funding, and naval aviation maintenance program adherence. EAF equipment is certified for operation per Naval Air Systems Command Instruction (NAVAIR-INST) 13800.12B, Certification of Expeditionary Airfield AM-2 Mat Installations, Aircraft Recovery Equipment, Visual/Optical Landing Aids, and Marking/Lighting Systems, and NAVAIRINST 13800.13B, Certification of Shore-Based Aircraft Recovery Equipment and Visual/Optical Landing Aids Systems.
The EAF subsystems include—

1. Airfield surfacing.
2. Aircraft arrestment.
3. Airfield terminal guidance landing.
5. Airfield lighting and marking.

**Airfield Surfacing System**

Airfield surfacing requires formal training and familiarization with equipment characteristics and design requirements (e.g., aircraft spacing, clearances, and fueling; airfield configurations; revetments; and ordnance safety arcs). The airfield surfacing system provides quick, responsive, and direct support to the ACE commander. MWSS’s ability to provide airfield surfacing enhances ACE’s scheme of maneuver. The airfield design and construction must be in accordance with NAVAIR certification requirements. Sixty-five percent of AM-2 matting installations involve planning aircraft parking, thus requiring first-hand knowledge of aviation intricacies (i.e., aircraft mix, characteristics, fueling requirements, and ordnance). See NAVAIR 51-60A-1, *Airfield Mat and Accessories*, and NAVAIR 00-80T-115, *Expeditionary Airfields Forward Operating Bases NATOPS Manual*, for AM-2 matting requirements.

**Aircraft Arrestment System**

The aircraft arrestment system is only found within the table of basic allowance (TBA) for the MWSS (FW). Applicable NAVAIRINSTs and Naval Air Training and Operating Procedures Standardization (NATOPS) dictate arrestment requirements for specific aircraft by type, model, and series after an airfield is established.

The expeditionary arresting gear is essential to the operation of EAF and enables the ACE to operate from host nation or captured airfields
that lack sufficient operating surface. Marine expeditionary aircraft arrestment systems provide high-cycle operations and the capability to recover U.S. tailhook-equipped aircraft. Emergency arrestment of disabled aircraft is critical to the forward basing concept. Use of expeditionary recovery equipment reduces the required minimum operational strip length for aircraft by providing arrestment for tailhook-equipped aircraft. Additionally, expeditionary recovery equipment provides overrun protection for aircraft during aborted takeoffs and during inclement weather or adverse runway surface conditions. Requirements are stated in NAVAIR 51-5EAA-2, M21 Expeditionary Aircraft Recovery System.

**Airfield Terminal Guidance Landing Systems**
The fresnel lens optical landing system (FLOLS) is an aviation-unique system that requires formal training to operate, NAVAIR compliance, and Marine Corps forces certification. This system ensures safe approach and landings, similar to aircraft carrier landing aids, by providing a predetermined glide slope and touchdown point for fixed-wing aircraft during day and night operations. The glide slope information is calibrated for an optimum touchdown point to facilitate safe arresting gear engagement.

Enhancement programs are managed by the Naval Air Warfare Center, Lakehurst, NJ (NAVAIR subsidiary). Aircraft terminal guidance requirements are stated in NAVAIR 51-40ABA-14, Fresnel Lens Optical Landing System (FLOLS) MK 8. Maintenance procedures are regulated by OPNAVINST 4790.2, The Naval Aviation Maintenance Program (NAMP).

**Communications**
The EAF branch should have dedicated access to ultra high frequency (UHF), very high frequency (VHF), and high frequency (HF) radio assets to monitor aircraft activity during routine and emergency operations. In addition, EAF branch communicates with other elements operating aboard an FOB (i.e., airfield operations, fuels, military police, ARFF, medical, and air traffic control). Internal and external communications should be conducted through a single radio system
assigned to individual sections. Sections will be responsible for maintaining and programming their radio system.

The AN/PRC-139 portable hand-held radio system provides EAF services branch with an internal/external, multiprogrammable communication system critical to operating an FOB or conducting expeditionary arresting gear operations. These radios are the primary communication assets used to provide connectivity between various airfield service organizations. Because these radios are TBA items, they are not the direct responsibility of the squadron S-6; however, the S-6 will provide technical advice and account for these assets when planning.

**Airfield Marking and Lighting Systems**

The airfield marking and lighting system consists of three principal components that are phased into the operation. Refer to NAVAIR 51-40ABA-7, *Lighting and Marking Systems for Expeditionary Airfields*, NAVAIR 51-40ABA-18, *Lighting and Marking for EAF Bare-Based Airfields*, NAVAIR 51-40ACB-1, *Airfield Emergency Portable Marker Light Battery Powered Type 1*, and NAVAIR 51-40ACB-2, *Portable Light Set Heliport*, for further information regarding the airfield marking and lighting systems.

**Field Marker Lights.** The field marker lights (FML) provide lighting during the initial phase (0-24 hours) of the airfield lighting operation. FML are man-portable, battery-operated, radio remote-controlled lights that provide airfield marking and lighting at night and during inclement weather. These lights also possess an infrared (IR), night vision device (NVD) compatible capability.

**Minimum Operating Strip Lighting System.** The minimum operating strip lighting system (MOSLS) provides lighting during the intermediate phase (24-72 hours) of the airfield lighting operation. To mark and light FOB runway surfaces, the MOSLS provides night, inclement weather, and IR lighting capability.

**EAF Hardwire Lighting System.** This system provides lighting for the semi-permanent phase (72 hours and beyond) of the airfield lighting
operational categories. Unlike the FML and the MOSLS, the hard wire system only supports airfield marking and illumination at night and during inclement weather. It does not possess an IR capability.

**Tactical Landing Zone**

The EAF services branch possesses the capability to conduct expedient tactical landing zone (TLZ) site surveys, selection, and marking. This capability is critical when conducting FOB operations forward of main operating bases. The TLZ provides flexibility through expandability by allowing the KC-130 to air land resupply and rapid ground refuel forward operating units and provides the ACE with the ability to project aviation power forward and sustain operations. The proper execution of a TLZ site survey provides the commander with critical information regarding the potential TLZ sites (i.e., surface load bearing capabilities, LZ dimensions, safety zone, and expandability).

Although the MATC mobile team (MMT) of the MACG has the capability to conduct expedient TLZ site surveys and selection, only the MWSS possesses the equipment and training necessary within the MAW to conduct soil suitability testing of potential TLZ sites. The MWSS maintains equipment that can determine the shearing strength of soils, asphalt surfaces and sub-grades, as well as soil analysis equipment, which can determine the gradation, compression, and content of the soil.

**Other Equipment**

All-weather, air traffic control services necessary to support air operations are resident within the MACG. Refer to MCWP 3-25.8, *Marine Air Traffic Control Detachment Handbook*, regarding MATC employment at airfields and FOBs.

**Aircraft Rescue and Fire Fighting**

An aviation-unique capability found only in the MAW MWSG, ARFF provides immediate and responsive rescue and fire fighting for airfield
emergencies at an FOB. ARFF is the first response for airfield, aircraft, and medical emergencies.

ARFF personnel are trained and equipped to handle aircraft emergencies. They possess the requisite knowledge of aircraft and safety hazards associated with rescue procedures, and they provide structural fire protection and fire inspector functions for air base facilities. ARFF personnel are trained in the use of extrication equipment for government and civilian vehicle mishaps. ARFF personnel are school-trained, federally certified, emergency-services technicians. They are also trained in emergency first aid procedures, to include hazardous materials emergency response, containment, and cleanup.

Extrication of aircrew involved in an aircraft mishap requires specialized equipment that is maintained by the ARFF branch, whose personnel are fully trained and proficient in its use. Mishaps involving aircraft present unique safety circumstances including flammable liquids, ordnance, and ejection seats. ARFF personnel receive specialized training in structural fire protection and methods of extinguishment as part of their formal schooling. Additionally, they receive quarterly training in the use of extrication equipment (e.g., jaws of life, air bags, rescue saws). ARFF personnel are also capable of conducting crash and salvage operations associated with an aircraft mishap.

Tactical and geographical considerations, dispersal of aircraft, and availability of finite assets within ARFF units are some of the factors that dictate ARFF support capabilities. A thorough review of ARFF requirements should be conducted during the planning phase for any operation, deployment, exercise, or expeditionary type training evolution. The MAGTF commander is responsible for establishing ARFF requirements on a case-by-case basis. Table 2-1 identifies minimum response requirements for active FOBs and air base facilities.

Refer to NAVAIR 00-80R-14, NATOPS U.S. Navy Aircraft Firefighting and Rescue Manual, NAVAIR 00-80R-14-1, NATOPS U.S. Navy

### Aircraft and Ground Refueling

The ACE is responsible for bulk fuel support and daily management of bulk fuel for airfields and FARPs. The MWSS provides bulk fuel support to organizations within the boundary of the airfield, including support to other Services’ aircraft if directed in the theater bulk fuel plan. Each MWSS possesses the personnel and equipment to fulfill this responsibility and maintains the capability to store and distribute large quantities of bulk fuel for the ACE.

The MWSS has the capability to fuel both fixed- and rotary-wing aircraft and to provide ground fueling to other ACE assets (i.e., mobile electric generators, tactical motor transport, field messing facilities, and AGS equipment). MACG, MALS, and Marine unmanned aerial vehicle squadrons possess tactical generators and motor transport assets without refueling capability.

MWSS can deliver fuel to aircraft while engines are not operational (cold refueling) or while they are operational (hot refueling). Naval Warfare Publication (NWP) 55-3-AH1, AH-1 Tactical Manual, Volume 1 (Rev. D) (NAVAIR 01-110HC-IT), and NAVAIR 00-80T-109, Aircraft Refueling NATOPS Manual, cover aviation ground refueling operations. These refueling operations can be conducted at established
airfields or at remote, austere FOB locations such as FARPs. This expeditionary fuel distribution capability provides flexibility to the ACE commander by allowing aircraft to refuel closer to the operational battle area thus increasing aircraft turnaround speed and extending the force’s combat radius. MWSS aviation and ground fueling allows the commander to use speed and information to overcome mass. See chapter 7 and appendix A for details regarding FARP operations. TAFDS, HERS, M970 refueler trailer, and six containers together (SIXCON) modular system are MWSS’s aviation and ground refueling assets.

**The Tactical Airfield Fuel Dispensing Systems**
The TAFDS is an aviation-specific system exclusively designed for aircraft. It consists of six 20,000-gallon collapsible tanks and can store up to 120,000 gallons of fuel. Experienced personnel can establish a TAFDS site within 48 hours.

MWSS (FW) possesses six complete TAFDS and can store the equivalent of 720,000 gallons of fuel at a time, which allows simultaneous refueling of 12 aircraft from 12 refueling points. MWSS (RW) rates 4 TAFDS for a total storage capacity of 480,000 gallons, which allows simultaneous refueling of 12 aircraft from 12 refueling points.

**Helicopter Expedient Refueling System**
The HERS is an aviation-specific system exclusively designed for aircraft refueling. The system carries eighteen 500-gallons pods for a storage capacity of 9,000 gallons. The MWSS (RW) rates seven HERS systems for a total storage capacity of 63,000 gallons, while the MWSS (FW) rates two HERS for a total storage capacity of 18,000 gallons. Experienced personnel can establish a HERS site within 4 hours. Because of its flexibility and mobility, it is ideally suited to support FARP operations.

**M970 Refueler Trailer**
Each MWSS rates 10 M970 refueler trailers for a total mobile storage and distribution capability of 50,000 gallons. The M970 can be used to either fuel or defuel aircraft. The M970 is well suited to support FOB operations over smooth terrain.
Six Containers Together Modular System
SIXCON modules are the principal assets used by the MWSS to meet the ACE’s ground refueling requirements. SIXCON consists of five 900-gallon containers and one pump module per system. Each MWSS rates four SIXCONs to support the ACE ground refueling operations for a total storage capacity of 16,000 gallons. Because SIXCONs can be loaded on either 5-ton trucks or Logistics Vehicle Systems (LVSs), it is well suited for FARP operations over rough terrain.

Explosive Ordnance Disposal
The EOD mission contributes to the mobility of the MAGTF by providing access to terrain, installations, and facilities otherwise denied due to hazards from unexploded ordnance (UXO). EOD units neutralize the hazards associated with UXO that are beyond the capabilities of other specialties. EOD personnel provide ordnance technical intelligence and improvised explosive device (IED) response. The EOD mission is accomplished by detecting, identifying, rendering safe, recovering, evaluating, disassembling, and final disposition of conventional weapons, NBC weapons, and IEDs. EOD units possess the capability to perform their mission in every environment.

Each MWSS EOD section consists of two teams that provide EOD support to the designated MAG and direct support to the FOBs established by their parent command. The mission of MWSS EOD section includes, but is not limited to, five specific areas:

- BRAAT.
- Tactical recovery of aircraft and personnel.
- FARP.
- Aircraft recovery support.
- Force protection.
MWSS EOD teams, located within the airfield operations division, provide the ACE the capability to handle hazards associated with UXO. MWSS EOD task-organizes response detachments, consisting of a minimum of two Marines, to support ACE elements. The MWSS EOD team provides the ACE the capability to respond to hung weapons, stuck ammunition, and munitions jettisoned from an aircraft. At times, armed ordnance may be partially suspended from an aircraft or ammunition may jam within the aircraft’s guns. The MWSS EOD teams also provide the ACE commander with the ability to promptly and safely clear area denial munitions during BRAAT operations.

Though MAW and force service support group (FSSG) EOD units are structured and equipped to perform EOD tasks, the roles in which the teams function are unique to each organization. EOD units in the FSSG focus primarily on ground ordnance and their methods of employment, while the MWSS EOD teams focus on aviation ordnance, explosive hazards, the aircraft associated with them. Because of the small number of specialized EOD personnel within the MAW to support the ACE, the teams may need to be augmented when the scheme of maneuver requires the use of multiple FARPs or during BRAAT operations. Refer to Fleet Marine Force Manual (FMFM) 13-8, MAGTF Explosive Ordnance Disposal, for further information regarding EOD employment and capabilities.

**AIR BASE SUPPORT FUNCTIONS**

Air base support functions are those activities necessary to establish and maintain air base operations, to include base camp operations. The air base support includes:

- Air base commandant functions.
- Internal airfield communications.
- Essential engineer services.
Motor transport.

Field messing facilities.

Routine and emergency sick call and aviation medical functions.

Organic and support unit personnel training.

NBC defense.

Security and law enforcement services.

**Air Base Commandant**

Because the MWSS provides the necessary functions and organization to plan, develop, improve, construct, maintain, and support the daily requirements of an airfield or FOB, the ACE commander normally designates the MWSS commanding officer or appointed representative to perform the role of the air base commandant. The air base commandant reports directly to the ACE commander in matters pertaining to air base planning and daily logistic requirements.

**Planning**

Under the air base commandant, the MWSS staff is responsible for designing the air base master plan (ABMP) for each FOB from which the ACE operates. The air base commandant will plan, develop, establish, and maintain the air base layout, to include the airfield layout and base camp design.

This planning and development requires extensive coordination with units that may be operating from the air base or FOB (e.g., ACE headquarters, squadrons, MACG, Marine wing communications squadron [MWCS], MALS, CSSE, naval construction forces [NCF], base defense operations center [BDOC], and other ABGD organizations).
When developing an ABMP, the air base commandant must consider the following:

- Ammunition supply point (ASP).
- TAFDS.
- Aircraft parking.
- Revetments.
- MATC and associated radar equipment.
- Air operations.
- ARFF.
- M-21 arresting gear.
- TACC.
- Billeting.
- Messing.
- Individual unit command centers.
- Communication facilities and networks.
- Power distribution.
- Water production and storage.
- Runway layout.
- Electrical power requirements.
- Road networks.
- Local airfield security.
In addition to the ABMP, the air base commandant coordinates the planning and development of BRAAT, NBC defense, and ABGD. This planning requires integration with low altitude air defense (LAAD) for air defense around the FOB and tenant aviation units that can provide close air support (CAS) and protective fires.

**Logistic Requirements**
The development and implementation of the ABMP requires the efficient use and application of the 14 AGS functions provided by the MWSS. After the FOB is established, the air base commandant is responsible for the following routine logistic tasks:

- Laundry.
- Showers.
- Trash collection.
- Field messing.
- Water production.
- Latrine servicing.
- Airfield shuttle service.
- Personnel augmentation.

**Internal Airfield Communications**
The dynamic nature of airfield operations necessitates dedicated and readily available communication support. While MACG provides the assets and coordination to support the ACE’s external communications and command, control, and coordination requirements, MWSS provides assets and coordination to support the internal communications requirements at established airfields and FOBs. The communications
assets resident within the MWSS link ACE units and supporting agencies located at the airfield and FOBs.

The MWSS S-6 department has a variety of communications equipment ranging from HF, UHF, and VHF radios to telephone switchboards. MWSG communications responsibilities include:

1. Tactical telephone service in and about the airfield, including tenant ACE units.
2. Intra-airfield radio communications.
3. Airfield security and ground transportation management.
4. Communications between the airfield and its adjacent facilities, such as ASP and petroleum, oils, and lubricants (POL) sites.
5. Wire systems installation, operations, and maintenance.
6. LAN access for tenant ACE units and the resident MWSS sections.

**Tactical Telephone Service**
Operations may allow for the transition from radio to telephone to improve reliability and security; reduce cost; and access commercial and defense service networks. Tactical telephone service gives an ACE the capability to install LAN, WAN, and other data systems critical for sharing information between commands and activities. LAN connectivity is the most efficient method for rapid movement of information and is essential for dissemination of critical operational information.

To provide tactical telephone service outside of the airfield, MACG equipment and personnel are used to maintain a multichannel radio link to higher agencies and adjacent airfield communications elements. Defense Switched Network (DSN), SIPRNET, and NIPRNET access are pre-established through multichannel radio communications.
Airfield Security
Complex airfield defense and security operations require immediate organic radio and wire line communications to link various units and organizations. It is imperative that force protection and air base security communications are established and maintained between the BDOC and air base tenant units.

Activities that provide early warning, traffic control, and access control must be incorporated into the communications architecture of the air base to maintain integration and control of air base defense operations. These organizations may be fixed or mobile, thus requiring both radio and telephone communications. Chapter 4 details the organizations and functions of ABGD operations.

Ground Transportation
Radio communications are necessary to manage ground transportation around the airfield or FOB. The MWSS S-6 department provides the necessary radio and wire line communications for the AGSOC to coordinate transportation movements. This includes, but is not limited to—

- Convoys to and from FOBs sites such as FARPs.
- Ground movement of personnel and equipment in and around the airfield.
- Logistic support of the ACE, including resupply and the movement of ordnance.
- Mobile security patrols in and around the airfield.
- Aircraft mishap recovery.

Airfield and Adjacent Facilities
The MWSS is responsible for establishing and maintaining communications in and around the airfield or FOBs, including ACE units operating adjacent to the airfield or FOB. Because of the large footprint and hazardous nature of unit operations, some ACE units will locate outside
the airfield or air base area. The ACE ASP and the MWSS bulk fuel storage and water production sites are generally located away from the airfield or FOB. Because of this geographic separation, the support squadron should make a special effort to ensure these organizations are integrated into the ACE’s communications architecture.

**Essential Engineer Services**

One of the key elements to ground service support is the engineer services provided by the engineer operations division. The MWSS engineer operations division is organized to provide the full range of general engineering support (less fuel) to designated ACE components. Figure 2-2 shows the engineer operations division's organization. Additional information regarding engineer support can be found in MCWP 3-17, *Engineering Operations*.

![Figure 2-2. Engineer Operations Division.](image)

The three main categories of engineer services provided by the engineer operations division are general engineering services, utilities, and material handling and heavy equipment services.
General Engineering Services
The engineer operations division provides a host of general engineering services necessary to support the ACE during operations. The following list includes tasks that the engineer operations division must provide per their T/O mission:

1. Engineer reconnaissance and survey.
2. Construction and maintenance of mission-essential base camp requirements, to include—
   - Revetments for TAFDS and HERS.
   - Temporary bunkers.
   - Temporary aircraft parking areas.
   - Strong-back framing for work and billeting tentage.
4. Development, improvement, and maintenance of airfield and air base drainage systems.
5. Camouflage expertise, equipment, and assistance to support ACE camouflage requirements.
6. Technical expertise in assessing bomb damage and providing the personnel and equipment necessary to perform RRR.
7. Limited mine detection capability.
8. Limited combat engineer services (e.g., countermobility, obstacles).
9. Construction, improvement, and maintenance of vertical/takeoff and landing (VTOL) and vertical/short takeoff and landing (V/STOL) facilities, not to exceed 900 feet.
Utilities
The MWSS possesses a host of equipment to provide mobile electric power to ACE airfield, base camp, and satellite locations. To increase habitability during sustained operations, the MWSS is equipped to produce and store sufficient quantities of potable water to support the ACE and to provide for personal hygiene (showers and laundry). The engineer operations division also maintains the refrigeration units that can support the messing and medical needs at the air base. Although the T/O allows for separate branches for electrical, refrigeration, and water supply/hygiene, these branches work under and within the utilities branch.

Heavy Equipment and Materials
Handling Equipment Services
The engineer operations division maintains the personnel and equipment necessary to repair, improve, and maintain existing roads within the ACE operating area; construct and maintain expedient roads; and meet the material handling equipment (MHE) needs of the ACE during deployment, buildup, and support operations. The division also has the equipment necessary to support base recovery and RRR. Because the MWSS possesses insufficient earth moving assets to accomplish large-scale runway repair or construction, it will require either reinforcement or augmentation from other engineer units from other MWSSs, the CSSE or the NCF.

When first deploying to an FOB or existing airfield, engineer operations division sends drafting and surveying branch personnel and engineers to the site to properly design and layout the base camp and air base area. Early physical reconnaissance can confirm the utility of landing sites that were proposed prior to the operation, as well as identify future upgrade and repair requirements. The information gathered can then be transposed into graphical representation through the use of computer-aided design (CAD) software. This information includes necessary utilities support, temporary shelters, and limited vertical and horizontal construction previously identified.
The MWSS is tasked mainly with expeditionary construction and is only required to maintain proficiency in constructing, improving, and maintaining V/STOL facilities not to exceed 900 feet. Any deliberate engineering support requirements that exceed the MWSS’s capabilities would be assigned to the engineer element of the CSSE or the NCF supporting MAGTF operations.

These organizations possess the personnel, equipment, and expertise to perform the preponderance of deliberate engineering, which include:

- Planning and constructing base camps.
- Improving unpaved roads.
- Constructing airstrips in excess of 900 feet.
- Repairing and improving existing bare-base airfields.
- Constructing EAF-type facilities.
- Repairing heavy airfield damage.

**Motor Transport**

The MWSS motor transport (MT) operations division provides the ACE with intrabase MT support, while the CSSE provides interbase MT support. Because MAGs and their respective squadrons do not have organic MT assets on their table of equipment (T/E), the MWSS maintains the MT assets necessary to fulfill the MT needs for the supported MAG.

FOB buildup requires rapid planning and the use of MWSS equipment without competing with other MEF requirements for support. Daily movement of ordnance, personnel, supplies, and equipment at an air base is essential to ACE operations. MT operations division provides light-, medium-, and heavy-lift MT tailored to ACE requirements.
Numerous containers and shelters within each MAG and MACG require lift within air base confines and within close proximity of the air base. A large number of shelters exceed the cross-country capacity of a 5-ton truck and require LVS support. This need for organic lift is magnified when required to establish and sustain FARP sites. The ASP requires dedicated daily support to move ammunition from storage sites to where it can be built up and loaded on aircraft. In addition to providing MT vehicle support, the MWSS trains and licenses ACE personnel who use MWSS vehicles to meet their MT requirements.

**Field Messing Facilities**

MWSS possesses the ability to erect and operate a dining facility in a field environment. This ability serves to further enhance an air base’s independence, mobility, and expeditionary nature. The capability to serve hot meals in the field and during irregular airfield working hours enhances the morale and quality of life of ACE personnel.

The MWSS field messing capability allows uninterrupted support of ACE operations. Because of logistical concerns associated with field messing functions, the field mess hall must be integrated with its parent and supporting agency during the deployment planning and preparation phases.

**Medical Services**

Each MWSS possesses an organic medical section to support the ACE. The MWSS medical support section comes equipped with sufficient medical equipment and supplies to establish a flight line aid station to provide medical care to one FOB and its tenant units. In addition to routine sick call, flight line aid stations provide aviation medicine, preventative medicine, laboratory, X-ray, and pharmacy services support.
Organic and Support Unit Personnel Training

The MWSS will normally be assigned the responsibilities for air base operations, air base commandant, ABGD, and BRAAT. The MWSS does not possess the personnel to perform these tasks. Each is manpower intensive and requires augmentation, cooperation, and participation from the entire ACE and other air base tenant units. Personnel assigned to the MWSS possess the technical knowledge and skills to perform and train augment personnel to accomplish required tasks. In addition to providing training to support critical activities, MWSS also trains and licenses ACE personnel in the operation of motor vehicles.

Nuclear, Biological, and Chemical Defense

The MWSS possesses an organic NBC defense capability as well as the preponderance of the equipment necessary to support and conduct NBC defense and decontamination operations for the ACE. Because NBC defense is a subfunction of BRAAT and a responsibility of the MWSS, the ACE will normally consolidate its NBC defense personnel and operations under the MWSS for management and execution. The senior ranking NBC technician, normally from the MAG, will supervise and coordinate NBC defense activities through the MWSS AGSOC. The MWSS must coordinate NBC defense activities with the other MWSS-supervised activities (i.e., BRAAT, RRR, airfield operations, air base operations, and air base defense operations).

A thorough and effective NBC defense plan requires extensive coordination and participation by ACE units. Marines must continuously train for NBC operations because of the severe environmental limitations. The ACE should schedule rehearsals and implement NBC defense into daily operations to accomplish the mission without creating additional casualties. Rapid and proper reaction to an NBC attack is critical for the ACE to remain effective. The MWSS NBC branch can assist in the coordination of the following ACE NBC defense activities.
Detailed Troop Decontamination
The detailed troop decontamination (DTD) team is formed from ACE squadron augments. DTD team members and MWSS NBC personnel must have a close relationship to ensure that proper training, supervision, and confidence are maintained. Personnel decontamination is the responsibility of the contaminated unit.

Detailed Equipment Decontamination
The detailed equipment decontamination (DED) team is formed from squadron members and MWSS NBC personnel. Team members must have a close relationship to ensure that proper training, supervision, and confidence are maintained. Equipment decontamination is the responsibility of the contaminated unit. Equipment, including aircraft, vehicles, weapons, and 782 gear, must be decontaminated properly to use it again.

Monitor/Survey
Essential to NBC defense, monitor/survey (M/S) teams maintain continuous monitoring of the area of operations (AO) for NBC attack. If contamination is a factor, team members reconnoiter alternate routes and potential areas to set up DTD and DED sites. M/S teams identify contaminated areas, calculate downwind hazards, alert and advise affected units, and compile and send the NBC 4 Report to the area control center team. Refer to chapter 6 for additional information on the M/S teams’ role during RRR.

Security and Law Enforcement Services
The MWSS military police (MP) department provides security and law enforcement services to the ACE. The primary mission of the MWSS military police at the FOB is to provide flight line security and security to critical ACE activities. Additionally, the MP department will provide criminal investigation, traffic control, mobile security patrols, crowd control, and enemy prisoner of war handling. Representing the core of the ACE’s ABGD, the MP department includes standing, mobile, and reaction forces. Because of their unique capabilities and
training, military police are ideally suited to train ABGD augments in the use of deadly force, small arms, and small unit defensive tactics.

The defense of an airfield includes both active and passive measures, as well as three-dimensional defense of aircraft ingress/egress routes and FARPs. Defensive measures require security force discipline to avoid collateral aircraft damage resulting from target engagement on the flight line.

A trained core unit of military police and thorough understanding of airfield defense are required to execute ABGD. Refer to chapter 4 for the role of the MP department during ABGD operations.

Flight Line and Critical Airfield Security Services
The MWSS MP department provides security for the flight line and other critical ACE facilities. MWSS MP members organize and train guard force, ABGD force, and rear area security platoon personnel from the MWSS and supported units in force protection, ground defense procedures, and weaponry. Because aircraft are considered high-value targets by the enemy, the flight line requires controlled access and heightened security.

Traffic Control/Enforcement, Convoy Escort, and Accident Investigation
The MWSS MP department is responsible for the control and enforcement of established traffic regulations in and around the airfield. The MP department is equipped with hard backed, high mobility multi-wheeled vehicles (i.e., M-1043 HMMWV) and automatic and crew-serve weapons to assist them in their security mission. Training, equipment, and experience enable the MWSS military police to provide security for ACE logistic convoys and FARP operations and to conduct ground accident investigations.

Straggler and Refugee Control
MWSS military police can erect and control temporary holding facilities for stragglers and refugees. However, prolonged commitment to straggler and refugee control degrades the military police’s ability to
provide security for aviation units. Because of the high manpower requirements and increased security risks, stragglers and refugees should be quickly relocated to off-base collection points or other appropriate facilities.

**Criminal Investigations, Physical Security Surveys, and Related Activities**

MWSS MP criminal investigators provide timely response to reported crimes. Physical security surveys are essential in determining the security needed at operational aviation facilities. Since security and defense are continuous throughout an operation, the need for upgrading security measures by identifying vulnerabilities is dependent upon timely and continuous surveys performed by trained personnel. Upgrading security measures will ensure the commander has a strong security posture.

**Base Camp Fire Protection and Prevention**

At FOBs, the MWSS ARFF branch is normally responsible for minimum response requirements (i.e., ARFF and structural fire protection) for the ACE base camp, ASP, and other facilities within proximity of the main base or air facility, unless adequate HN capability is available. If HN firefighting support is used, the HN training, tactics, organization, and equipment must be thoroughly reviewed.

In addition to minimum response requirements to support aviation operations, one crash structural vehicle should be maintained in a fully manned condition to permit ready response to ACE base camp fire emergencies. Additional equipment above the minimum response should be planned for and provided to support the broad range of fire protection required at FOBs. An example of a fire protection plan is provided in appendix B.