ARMY, MARINE CORPS, NAVY, AIR FORCE

AIRFIELD OPENING

MULTI-SERVICE TACTICS, TECHNIQUES, AND PROCEDURES FOR AIRFIELD OPENING

ATP 3-17.2
MCRP 3-20B.1 [3-21.1B]
NTTP 3-02.18
AFTTP 3-2.68

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MULTI-SERVICE TACTICS, TECHNIQUES, AND PROCEDURES

FOREWORD

This multi-Service tactics, techniques, and procedures (MTTP) publication is a project of the Air Land Sea Application (ALSA) Center in accordance with the memorandum of agreement between the Headquarters of the Army, Marine Corps, Navy, and Air Force doctrine commanders directing ALSA to develop MTTP publications to meet the immediate needs of the warfighter.

This MTTP publication has been prepared by ALSA under our direction for implementation by our respective commands and for use by other commands as appropriate.

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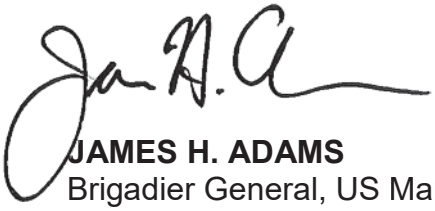

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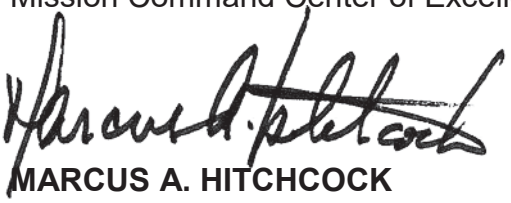

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PREFACE

1. Purpose

This multi-Service tactics, techniques, and procedures (MTTP) publication for Airfield Opening is a single source, descriptive reference guide for opening and transferring an airfield.

Note: For the Army, the term “command and control” was replaced with “mission command.” Mission command now encompasses the Army’s philosophy of command (still known as mission command) as well as the exercise of authority and direction to accomplish missions (formerly known as command and control). This publication will use the term command and control (C2) exclusively.

2. Scope

This MTTP publication supports operational commanders and staffs by establishing tactics, techniques, and procedures (TTP) for airfield opening. This publication provides guidance for operational commanders and staffs on opening and transferring an airfield. It contains information on Service capabilities, planning considerations, airfield assessment and surveys, opening the airfield, and transitioning the airfield in all operational environments.

3. Applicability

This MTTP publication applies to all commanders, senior airfield authorities, planning staffs, airfield opening forces, air traffic controllers, and support agencies.

4. Implementation Plan

Participating Service command offices of primary responsibility will review this publication; validate the information; and, where appropriate, reference and incorporate it in Service manuals, regulations, and curricula as follows:

Army. Upon approval and authentication, this publication incorporates the TTP contained herein into the United States (US) Army Doctrine and Training Literature Program as directed by the Commander, US Army Training and Doctrine Command (TRADOC). Distribution is in accordance with applicable directives listed on the authentication page.

Marine Corps.[1] The Marine Corps will incorporate the procedures in this publication in US Marine Corps doctrine publications as directed by the Deputy Commandant, Combat Development and Integration (DC, CD&I). Distribution is in accordance with the Marine Corps Publication Distribution System.

Navy. The Navy will incorporate these procedures in US Navy training and doctrine publications as directed by the Commander, Navy Warfare Development Command (NWDC) [N5]. Distribution is in accordance with *MILSTRIP/MILSTRAP Desk Guide,* Naval Supply Systems Command Publication 409.

[1] Marine Corps PCN: 144 000217 00

Air Force. The Air Force will incorporate the procedures in this publication in accordance with applicable governing directives. Distribution is in accordance with Air Force Instruction 33-360, *Publications and Forms Management*.

5. User Information

a. US Army Combined Arms Center; HQMC, DC, CD&I; NWDC; Curtis E. LeMay Center for Doctrine Development and Education (LeMay Center); and Air Land Sea Application (ALSA) Center developed this publication with the joint participation of the approving Service commands. ALSA will review and update this publication as necessary.

b. This publication reflects current joint and Service doctrine, command and control organizations, facilities, personnel, responsibilities, and procedures. Changes in Service protocol, appropriately reflected in joint and Service publications, will be incorporated in revisions to this document.

c. We encourage recommended changes for improving this publication. Key your comments to the specific page and paragraph and provide a rationale for each recommendation. Send comments and recommendations directly to:

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SUMMARY OF CHANGES

ATP 3-17.2/MCRP 3-20B.1/NTTP 3-02.18/AFTTP 3-2.68, *Multi-Service Tactics, Techniques, and Procedures for Airfield Opening*.

This revision:

Updates:

- The structure of this multi-Service tactics, techniques, and procedures publication for functionality and alignment with Air Force tactics, techniques, and procedures 3-4.4, *Contingency Airfield Operations,* phasing.
- Service capabilities.
- Joint task force-port opening capabilities and references.
- Lessons learned.
- Checklists to align with current Service doctrine.

Removes:

- The lessons learned appendix.
- Redundant or outdated information.

Adds:

- Expeditionary and contingency airfield planning considerations.
- Air traffic control and air traffic control ratings.
- A discussion of transition operations.
- Checklists for planning, assessments, airfield opening, and transition.
- Planning factors for key personnel.
- Functions of airfield operations.

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AIRFIELD OPENING

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EXECUTIVE SUMMARY

AIRFIELD OPENING

This multi-Service tactics, techniques, and procedures publication for Airfield Opening is a single source, descriptive reference guide for opening and transferring an airfield.

Chapter I Expeditionary Airfield Planning

Chapter I provides commanders and staffs tactics, techniques, and procedures to use in planning an expeditionary or contingency airfield. This chapter includes discussion on the operational environment, mission analysis, integration of the United States Transportation Command joint task force-port opening, and air traffic control planning considerations.

Chapter II Airfield Assessment and Surveys

Chapter II examines airfield assessment capabilities including assessment team options, assessment considerations, provides an overview of surveys, and examines how to publish survey and assessment data.

Chapter III Opening an Airfield

Chapter III provides guidance on opening an airfield, including planning factors, command relationships, functions of an airfield, available forces, and how to perform initial operations.

Chapter IV Airfield Transition Operations

Chapter IV provides an overview of airfield transition operations. This chapter discusses preparation, transition to follow-on forces or the host nation, enabling civil authority, and closing an airfield.

Appendix A Airfield Planning Checklist

Appendix A provides users a planning checklist to prepare prior to conducting contingency airfield operations.

Appendix B Airfield Assessment and Survey Checklist

Appendix B provides users with an assessment and survey checklist to build off the Air Mobility Command Form 174, *Airfield Survey*.

Appendix C Airfield Opening Checklist

Appendix C provides users a comprehensive checklist to open and run a contingency airfield.

Appendix D Air Traffic Control and Airfield Transition Checklist

Appendix D provides users a checklist to transition air traffic control and the airfield to follow-on forces, the host nation, or a civil authority.

Appendix E United States Army Capabilities

Appendix E examines Army airfield opening capabilities, organizations, and available forces.

Appendix F United States Marine Corps Capabilities

Appendix F examines Marine Corps airfield opening capabilities, organizations, and available forces.

Appendix G United States Air Force Capabilities

Appendix G examines Air Force airfield opening capabilities, organizations, and available forces.

Appendix H United States Engineer Capabilities

Appendix H examines Army, Marine Corps, Airforce, and Navy engineering capabilities, organizations, and available forces as they relate to airfield operations.

Appendix I United States Transportation Command Joint Task Force-Port Opening (JTF-PO) Capabilities

Appendix H examines JTF-PO Capabilities and organization.

Appendix J Service Air Traffic Control Ratings and Credentials

Appendix J examines Service air traffic control ratings, credentials, and how Services certify air traffic controllers.

Appendix K Airfield Layout and Characteristics

Appendix K examines the key features of an airfield and layout considerations.

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Chapter I
Expeditionary Airfield Planning Considerations

1. Overview

a. The purpose of this chapter is to frame the establishment of an aerial lodgment, and to identify key planning considerations. This will assist planners in identifying the five “Ws” (who, what, where, when, and why) on force projection in the initial stages of planning.

b. Identifying the combatant commander’s (CCDR’s) intent early in the operational planning process is important for influencing the Service’s port opening capabilities as a tool to project airpower. This force is considered a “supported” ground force maneuver element which ensures adequate force protection measures and resource allocation are included for potential follow-on missions.

2. Operational Environment

a. Establishing and maintaining aerial lodgments that enable aviation asset positioning within the range of supported forces supplement aviation employment. These tasks become more complicated when airbases are hosts to a variety of military, nongovernmental organizations (NGOs), other governmental organizations, and commercial air activities.

b. The Army and Air Force hold joint responsibility for selecting landing zones (LZs), with the objective of deploying and sustaining the air-landed or airborne force. The Army coordinates the LZ site selection with the Air Force before making the final decision. Information gathered from a landing area study that highlights options ranging from existing large, modern facilities to more austere and underdeveloped areas suitable only for short takeoffs and landings provides the basis for this decision. Planners should include a weather technician in LZ studies and selection to obtain pertinent climatology and predominant wind direction. Planners evaluate potential sites based on suitability by type, quantity and sortie rate of aircraft; and the capacity of available airfield support facilities or services. Planners will identify infrastructure requirements (in terms of repair or improvement) and provide a prioritized listing of recommended projects to the commander who will approve and assign construction tasks (mission) to an engineer force.

c. The Marine Corps is responsible for selecting landing areas to deploy and sustain Marine forces ashore. Where time allows, qualified Marine airfield assessors should forward Air Force (AF) Form 3822, *Landing Zone Survey* (or other airfield assessment information) to the combined air operations center (CAOC), via the operational chain of command, so the information is available to the joint force. This provides follow-on forces useable information on the airfield status at the time of information collection. In some instances, it may be the only information available for a particular location.

d. Desirable characteristics of LZs are ease of identification from the air; a straight, unobstructed, secure approach for aircraft, proximity to ground objectives and units,

and suitable weather conditions. Some necessary characteristics of LZs identified for development into theater aerial ports with sophisticated facilities are the following.

(1) An area of sufficient size to accommodate the number and type of aircraft introduced.

(2) Areas for parking and dispersal to accommodate the planned capacity of the facility.

(3) An internal road network, capable of supporting use by ground vehicles that directly support airfield operations.

(4) Minimum construction and maintenance requirements.

(5) Areas and facilities for air terminal operations.

(6) Facilities for holding personnel awaiting evacuation (e.g., medical or noncombatant persons).

(7) Sufficient aerial port capacity to handle incoming personnel, equipment, and supplies.

(8) Facilities to support aircraft rescue and firefighting vehicles and equipment.

e. Well-established and maintained aerial ports are essential to successful aviation combat and sustainment operations. These operations include air movement and aerial sustainment of special operations, light, airborne, air assault, and heavy forces. Aviation sustainment operations also support high-priority resupply and air movement throughout the theater of operations.

f. Airfield service elements must maintain the capability of 24/7 operations and an ability to launch and recover aircraft safely in all weather conditions. This requires:

(1) Experienced and adequately trained airfield management, air traffic controllers, and airfield systems personnel.

(2) Adequate personnel and resources maintained through appropriate battle rhythm management.

(3) Operational, sustainable, and certified navigational aids (NAVAIDS) and approved terminal instrument procedures (TERPS).

(4) Adequate airfield lighting and required airfield markings.

(5) Advanced, digitized communications systems providing increased situational awareness.

(6) Adequate weather equipment and trained weather personnel.

g. Types of aircraft using the airfield and the assigned tasks associated with the airfield's mission dictate airfield planning principles and services. Consider the mission, enemy, terrain and weather, troops, time available, and civil considerations when evaluating airfield requirements.

h. The combination of the enemy threat, high-density air traffic, lack of established procedures outside airport traffic areas, and tactical unmanned aircraft system

(UAS) operations create the potential for midair collisions in a low-altitude environment.

i. The most critical components of a successful airfield opening are the senior airfield authority (SAA) and base operating support-integrator (BOS-I) and their interactions. The commander should designate the personnel to fill these responsibilities early to facilitate transition from expedient to sustained operations.

j. The SAA is appointed by the Service component commander who is responsible for airfield operations at the direction of the joint force commander (JFC). The SAA controls, operates and maintains the airfield. This includes the Deployable Air Traffic Control and Landing System (DATCALS); runways; taxiways and parking ramps; and air, land, safety surfaces and facilities the proximity of which affects airfield operations. The SAA coordinates all component or joint task force (JTF) aircraft and airfield facilities. The SAA controls airfield access and is responsible for safe operations in the airport traffic area, controlled movement areas, and on all airfield surfaces. Airfield operations personnel are the on-site focal points of operations and have primary responsibility for operating the airfield, enforcing airfield operating procedures, and coordinating airfield requirements on behalf of the SAA. Due to the rapid and evolving nature of an airfield opening, the SAA may not be designated or available at the commencement of operations. Under these circumstances, the initial airfield opening forces commander (e.g., special tactics mission commander, contingency response force (CRF) commander, or senior officer on the ground) will serve as the acting SAA until the designated SAA arrives. (See Joint Publication (JP) 3-17, *Air Mobility Operations,* or Air Force tactics, techniques, and procedures (AFTTP) 3-4.4, *Contingency Airfield Operations*).

(1) The JP 3-17 definition of SAA does not assign authority and is often open to interpretation, particularly with respect to “land and facilities whose proximity affects airfield operations”. It is important that a command relationship is determined among SAA, BOS-I, and tenant units using the airfield to streamline funding and logistics support channels and ensure the airfield operating surfaces are deconflicted from the life-support area. The SAA controls airfield access and coordinates for airfield security with the base commander, base cluster commander, or joint security coordinator for the area (if a base commander has not been designated).

(2) To enhance combat effectiveness and operational efficiency, SAA staff planners should define expectations of the supporting units and for the supported units. Other details should be discussed; including administrative and operational responsibilities for supported and supporting units, identification of resource requirements, and allocation of available resources.

(3) During the planning process, the SAA and staff will ensure the proper personnel, equipment, and support are coordinated to execute the mission. Whether conducting deliberate or crisis action planning, the SAA will assign operational planning team (OPT) members to higher headquarters (HHQ) OPTs. These OPTs also may convene their own OPTs to plan personnel, equipment,

and supplies deployment, build up the site capacity, and conduct sustained airfield operations.

(4) Sites established on a host nation (HN) air base or airport will require detailed coordination with the HN air base commander, or site commander, or civil authority. The SAA will coordinate airfield support, real estate management, and other air base support with the authority who is responsible for the air base. The SAA will evaluate the level of support and services provided by the HN air base commander and identify shortfalls or deficiencies to HHQ.

Note: The USMC uses the term site commander in lieu of base commander (per Marine Corps reference publication (MCRP) 3-20F.3, *MAGTF Aviation Site Command Handbook*). This publication will use base commander exclusively with the understanding the USMC uses site commander for an air facility.

(5) Upon arrival, the SAA begins to assume the position's responsibilities from the airfield seizure force commander, but must coordinate with the airfield seizure force commander during planning and establishment of airfield operations. SAA transition is particularly challenging if not preplanned or executed early in base build-up. Coordination of expeditionary airbase build up between key personnel of the airfield seizure force, SAA organization, and tenant commands at the airfield will improve the pace of the build up and the safety and efficiency of airfield operations.

k. The BOS-I is a CCDR-designated representative who acts as the joint base operating support (BOS) or base operating support service provider. The Service component with the preponderance of forces at a base should provide the BOS-I. A CCDR may designate an individual within a Service component or JTF as the BOS-I at each operating location. The BOS-I coordinates using mission support resources efficiently. Where shortfalls or opportunities for efficiencies exist, the CCDR may task JTF components to provide or coordinate specific capabilities (e.g., infrastructure or installation security communications). The BOS-I conducts master planning for facilities and real estate. BOS-I responsibilities may include collecting and prioritizing construction requirements, seeking funding support, environmental management, emergency management, force protection, facility use, and hazardous waste management. See AFTTP 3-4.4 for more information.

l. The communications integrator, a sub-function of communications management performed by the component or agency, is responsible for coordinating and integrating all communication services and capabilities at a designated airbase or airfield.

m. The BOS-I and SAA have an important interaction. In many cases the CCDR will designate a BOS-I and SAA from different Services at the same location (e.g., a common practice is to designate BOS-I responsibilities to the Army component while designating SAA responsibilities to the Air Force component). The BOS-I is the joint BOS provider for the operating location or base and the SAA is responsible for airfield control, operation, and maintenance including runways, associated taxiways and parking ramps, and land and facilities affecting airfield operations. As such, the SAA will perform many BOS functions on the facilities immediately surrounding the

airfield. The BOS-I and SAA should closely coordinate along this seam during operations planning and execution. A common solution is to form an agreed-upon boundary line around the airfield and designate the SAA responsibility for the area inside the line and the BOS-I responsibility for the area outside the line. Refer to table 1 for an overview of airfield responsibilities.

Table 1. Airfield Responsibility Planning Matrix

Base Operating Support-Integrator	Senior Airfield Authority	Communications Integrator
• Contracting • Feeding • Water • Environmental • Field engineering • Material handling equipment • Explosive ordnance disposal • Medical • Chemical, biological, radiological, nuclear, and explosive • Industrial • Rail or road • Storage • Utilities • Training • Lodging • Sanitation/laundry/bath • Force protection	• Aerial port • Refueling • Crash fire rescue • Air traffic control • Weather • Lighting • Fleet service • Material handling equipment	• Frequency management • Communications security • Cybersecurity • Transmission • Technical control facility • Base command, control, communications, computers and intelligence infrastructure

3. Mission Analysis

a. Operations that require airfield openings can range from combat operations in a hostile environment to emergency, humanitarian assistance (HA), and disaster relief (DR) missions conducted in a permissive environment. An airfield opening can be nested as part of a larger mission or as a staging point for follow-on operations. Opening an airfield supports the JFC's broad mission. An understanding of how the airfield opening process will align within the larger mission for the joint force is critical for mission planners. When conducting HA/DR missions, contact the US Defense Attaché liaison officer of the supported country to gain situational awareness early in the planning process.

b. Planners, at all levels, contribute to mission analysis. It is imperative that all required functional leads are involved in mission planning from the outset, including the Army rapid port opening element (RPOE) unit, Air Force contingency response group (CRG), Air Force Special Operations Command special tactics squadron (STS), Marine air-ground task force planners, HA rapid response team, supported

combatant command planners, and the Air Force forces staff. Sharing critical information will help clarify implied tasks, assess mission risks, and develop alternative courses of action.

c. During a mission analysis, planners examine the mission, available assets, facts, and assumptions to determine the specified and implied tasks. Airfield openings are a component of larger missions or major operations. Therefore, planning for an airfield opening should be integrated with planning the larger mission or major operation. This can be accomplished by providing liaison officers to the headquarters that is planning the major operation or using electronic collaborative planning tools and systems to connect that organization. Including airfield planners early in the process provides sufficient time to perform surveys of the existing airfield and identify resources (e.g., real estate, materials, equipment, personnel, funding, time) required to construct an airfield expediently. In addition, it will ensure planners identify appropriate airfield capabilities to meet the JFC's requirements for deploying forces and providing combat support and sustainment.

d. Integrating airfield operation planners from the commencement of planning helps the JFC and staff identify requirements associated with establishing and operating an airfield while sufficient time remains to coordinate resources to match identified requirements. These include the following.

(1) Developing a task-organized force deployment package for an airfield opening.

(2) Developing estimates of airfield capabilities and requirements to provide requisite support to tenants and designated forces.

(a) Identify maximum (aircraft) on ground (MOG).

(b) Identify the aircraft parking plan and movement area.

(c) Identify the cargo throughput capacity (e.g., consider size, locations, storage area security, and material handling equipment available or required).

(d) Consider forward arming and refueling point (FARP) site location and assessment.

(3) Providing equipment and manning required for airfield operation.

(4) Coordinating inter-Service and interagency communication.

(5) Establishing priorities of work for airfield opening.

(6) Identifying activities that can be conducted with airfield seizure and airfield opening.

e. There are four primary phases of airfield opening. They are:

(1) Phase I, Seize the Airfield. The US Army, USMC, and special operations forces (SOF) may conduct an airfield seizure by a ground, air-land, or airdrop method of maneuver.

(2) Phase II, Open the Runway. The runway is open when the runway, taxiway, and ramp approved for use with clearance for the first aircraft to land. Additionally, the airfield is secure and capable of supporting operations.

(3) Phase III, Open the Airfield. The airfield is open when sufficient ramps, taxiways, and facilities can support the intended airflow and sortie rate.

(4) Phase IV, Open the Airbase. An airbase is open when sufficient space exists to allow combat and combat support forces to bed down. The task is complete once forces are in place to extend, and subsequently replace, the initial open–the-airbase force capability. A checklist with factors to consider during mission planning is included in appendix A.

4. JTF-PO

a. Although all Services have the organic capability to execute theater-opening functions, traditional service port opening and operating forces may not be sufficient in situations that require rapid response or joint integration. The USTRANSCOM JTF-PO aerial port of debarkation (APOD) provides the supported geographic combatant commander (GCC) with a rapid assessment of potential aerial ports and their distribution infrastructures. It also provides a port opening capability to facilitate crisis response in established or austere environments. The JTF-PO's mission is to be in place in advance of a force deployment or arrival of sustainment, humanitarian, or relief supplies.

b. JTF-PO is a scalable joint expeditionary capability that enables USTRANSCOM to rapidly establish, operate, and clear a port of debarkation (POD). Additionally, JTF-PO forces can conduct cargo-handling operations to a forward distribution node and facilitate port throughput in support of a GCC-executed contingency.

c. Defense Logistics Agency (DLA) can deploy a rapid-deployment team (RDT) with JTF-PO forces, if necessary, to support the JFC with expeditionary contracting capability and expertise. DLA can leverage existing strategic-level contracts within the theater, to support the JFC or help establish provisional contracts to support mission requirements. DLA's primary mission is to assist in establishing theater openings and facilitate distribution operations beyond the forward node.

d. The Commander, USTRANSCOM has the authority to deploy a JTF-PO in direct support of the supported GCC (as authorized in the Unified Command Plan and Secretary of Defense standing execute order). For more information on JTF-PO, see appendix I.

5. ATC Considerations

a. Commanders, across the Services, should determine the ATC capabilities and required forces, arrival sequence, and HN and adjacent nation restrictions to plan ATC operations. The aircraft control authority will need expertise from Service ATC representatives and HN liaison elements for coordination with all relevant agencies. Consider the following critical factors during the planning phase to enable effective ATC services.

(1) Plan for the full range of ATC operations to support deliberate and crisis action planning for deploying, employing, sustaining, and redeploying forces. Specifically, consider the following.

(a) Length of the operation.

(b) Size of the air base (e.g., forward operating base, main air base, air facility, air site, and air point).

(c) Complexity of the area (e.g., the mixture and volume of existing civilian structures, services, NAVAIDS, and runways' condition).

(d) Type and density of traffic (e.g., rotary wing (RW), fixed wing (FW) unmanned aircraft operations).

(e) Primary users (e.g., SOF, fighters, cargo transporters, other governmental agencies, coalition forces, or humanitarians).

(f) Type of service.

- Instrument flight rules (IFR) and visual flight rules (VFR).
- Radar or non-radar.
- Terminal.
- Single or multiple precision or nonprecision approaches.
- En route control.

(g) Personnel requirements (e.g., qualifications, liaisons, and translators).

(h) Equipment reliability, back-up capability, and connectivity.

(i) Disposition of base (e.g., a base that transitions to different use with different Service and equipment requirements).

(j) Environment (e.g., permissive, nonpermissive, terrain, climatology, visual or instrument meteorological conditions, winds, temperature, or density altitude).

(k) Threats and force protection.

(l) Interface between terminal and en route ATC systems.

(m) Base operations support (e.g., power, supply, maintenance, billeting, medical, and provisions).

(n) Aircraft operation restrictions near munitions storage.

(o) Frequency requirements for radio, radar, and NAVAIDS.

(p) Airfield lighting requirements.

(q) Ensuring the initial plan considers transition procedures that will be required to transition the ATC back to the HN or another agency.

(2) Coordinate HN integration of the civil ATC system, including agreements for national and international air traffic coordination and negotiation of international-level agreements.

(3) Coordinate with adjacent command and control (C2) agencies to establish procedures for control hand-offs, reference points, and ATC sharing. Use letters of agreement or memoranda of understanding to record airspace management and control decisions.

(4) Collaborate with the joint air operations center or CAOC combat plans division to integrate airspace design into the development of the ATC plan.

(5) Coordinate TERPS reviews for theater airfields. Review preexisting HN or commercial instrument procedures for Department of Defense (DOD) approval.

(6) Coordinate flight inspections, as required. If instrument NAVAIDS and IFR procedures are necessary to meet mission objectives, the following two areas are required:

(a) TERPS specialists (Marine, Army, and Air Force) participate, when warranted or requested, in initial NAVAID site surveys. TERPS specialists provide recommendations regarding siting deployable NAVAIDS used in developing instrument procedures and can forward site survey data to the appropriate higher headquarters' TERPS office that is responsible for the operational area. Authorization to use the procedures remains with the appropriate flying operations authority and the commander exercising operational control (OPCON) of the aircraft. If possible, a flight inspection should be scheduled. Flight inspections specify required obstruction clearances and verify the performance of air navigation services and ensures their instrument flight procedures conform to prescribed standards documented in the Federal Aviation Administration (FAA), DOD, and Annex 10 of the Convention on International Civil Aviation Organization (ICAO) directives. In accordance with Service regulations, flight inspections must be performed during daylight hours and require visual, meteorological conditions weather. Inspecting a single NAVAID takes half a day and as few as one sortie to complete.

(b) Flight inspection methods incur varying risks for the commander. The following four options are available to the joint force air component commander (JFACC) listed from high to low risk.

- Option 1, Approval without FAA Flight Inspection. Theater commanders have the final authority and responsibility for accomplishing their mission. If the military situation dictates and a Service allows using an installed NAVAID and approach without a flight inspection, this authorization is restricted to aircraft under the individual Service approval authority's OPCON will be annotated with specific flying units use only (e.g., "For Use By [specific unit] Aircraft Only").

- Option 2, Military Contingency Flight Inspection. The appropriate flying operations authority and theater commander exercising OPCON of the

aircraft may approve an abbreviated flight inspection for radar approaches and certain new instrument procedures in accordance with chapter 24 of FAA Order 8200.1C, *United States Standard Flight Inspection Manual* (also identified as technical manual (TM) 95-225, Naval Air Systems Command (NAVAIR) 16-1-520, and Air Force manual (AFMAN) 11-225). This inspection allows a theater commander to have temporary IFR capability for aircraft under the direction of the JFC.

- Option 3, Restricted Facility Commissioning. This inspection certifies the NAVAID and instrument approach using normal procedures to support a minimal number of IFR approach procedures in accordance with FAA Order 8200.1C/TM 95-225/NAVAIR 16-1-520/AFMAN 11-225. The restricted facility commissioning inspection permits use by any aircraft. Areas evaluated as acceptable are certified for use, and the remaining areas and procedures are restricted. The local (deployed) airspace officer or ATC manager will publish the restrictions in a Notice to Airmen.

- Option 4, Normal Commissioning. This is the full certification of all procedures (i.e., arrival, approach, and departure) and areas of NAVAID coverage in accordance with FAA Order 8200.1C/TM 95-225/NAVAIR 16-1-520/AFMAN 11-225. Each Service will submit all instrument procedure certifications through the appropriate chain of command. Once complete, the procedures and airspace are certified to support all aircraft (i.e., DOD, civil, HN, coalition forces, etc.) including aircraft transiting through en route airspace.

(7) For a detailed planning checklist, refer to Appendix A, Airfield Planning Checklist.

Chapter II
AIRFIELD ASSESSMENT AND SURVEYS

Ecuador Humanitarian Assistance/Disaster Relief

"In Ecuador, the host nation advocated for the mobile tower to be placed at a location specifically decided upon for convenience. The airfield systems' maintainers emphasized the potential limitations of the equipment in that location, but were outranked in the decision. The convenient location did not allow for suitable communication with the inbound aircraft and ultimately was relocated to the maintainers' originally advised location."

SOURCE: Technical Sergeant Nicholas Lossett, United States Air Force, Airfield Systems Technician, April 2016

1. Overview

When tasked by USTRANSCOM or the supported GCC, assessors perform airfield assessments prior to an airfield opening. They may perform additional assessments for unfamiliar airfields, damaged airfields, or any time a large contingent of follow-on forces is expected. Planners have many tools available to conduct an airfield assessment remotely; but, usually, an in-person assessment is necessary. Although similar, airfield assessments and nongeodetic surveys occur at separate times and serve separate purposes. The terms airfield survey and assessment are sometimes used interchangeably. Surveys and assessments support two distinctly separate missions. The following paragraphs describe the different actions that support assessments versus surveys.

a. An airfield assessment focuses on identifying and overcoming the impediments to the mission. An airfield assessment may occur in permissive or uncertain environments. Timing for an assessment is immediately following an unopposed entry (permissive) or after an airfield seizure by the joint force (uncertain).

(1) An assessment should validate or determine the suitability of a designated airfield for a pending air mission, in support of an actual contingency, or for other airfield assessment requirements designated by the tasking authority. Critical assessment aspects include airfield capabilities, limitations, air movement facilities available, and obstruction clearance in the departure and arrival areas. Planners will need to consider runway characteristics and taxiway, parking, ramp, and cargo handling areas for operational suitability, and determine MOG limitations. See JP 3-17 for more information.

(2) The airfield assessment should be done as early as possible to verify information and to identify additional requirements. Report results back through secure, dependable, long-range communications, as directed, through command channels. It will provide a recommendation on the suitability of future airfield operations to decision makers.

b. A nongeodetic airfield survey provides data for the Global Decision Support System (GDSS) airfield database. See paragraph 7d for more information on GDSS access. This survey is conducted in a permissive environment. This survey is a

physical investigation of a location, conducted for gathering data to support planned or possible contingency operations. The historical data provides the foundation for future assessment team airfield evaluations conducted in response to an actual contingency. Site surveys:

(1) Determine the feasibility of a location for planned operations.

(2) Validate information about equipment, terrain, HN resources, and infrastructure (such as serviceability, availability, and compatibility).

(3) Gather critical information and facilitate planning for future operations.

2. Airfield Assessment and Survey Teams

Airfield assessment teams, specifically trained to conduct a rapid airfield evaluation, execute airfield assessments enabling commanders to make airfield suitability decisions. The assessment team may be composed of coalition, single-Service, or multi-Service personnel; intergovernmental or nongovernmental organizations; or civilian representatives. The following are some of the most common assessment teams.

a. SOF. The composition varies, but it often consists of Air Force combat controllers assigned to a special tactics team (STT). Combat controllers survey and establish airfields in austere or hostile areas while providing ATC to land aircraft during combat and humanitarian missions. (ALSB 2016-2, p. 18) STTs can conduct LZ and drop zone (DZ) surveys and complete an Air Mobility Command (AMC) Form 174, *Airfield Survey*.

b. Marine Expeditionary Forces. Marine Expeditionary Forces can conduct LZ and pavement surveys or assessments. A survey team is task organized to meet the mission requirement. Marine airfield survey teams are trained and equipped to assess the capabilities of an airfield and its supporting facilities. They relay that information to authorities who deploy any needed augmentation or engineer forces. A team usually consists of three to five personnel trained to conduct LZ and airfield assessments. Marines who have received an airfield pavement evaluation training course certification also can conduct pavement surveys. Teams typically consist of air traffic controllers, expeditionary airfield Marines, and engineers. The Marine Expeditionary Forces' airfield survey team can produce an expedient pavement evaluation and a formal assessment report within 24 hours, to assist in command-level go/no-go decisions.

c. The USAF 7E1AM. This team can produce an expedient pavement evaluation and a formal assessment report within 24 hours to assist in command-level go/no-go decisions.

(1) Personnel. This team is composed of eight Air Force CRG personnel, including a rated officer, airfield operations officer or airfield manager, civil engineers, a communications noncommissioned officer (NCO), a security forces NCO, and a mission-dependent specialty.

(2) Equipment. The team's equipment includes two high mobility multipurpose wheeled vehicles, two all-terrain vehicles, very high frequency and ultrahigh

frequency capable radios, and satellite communications equipment capable of supporting the team for 72 hours.

(3) Deployment Methods. The team delivery may occur by FW, RW, or convoy insertion methods.

d. The USAF 7E1AK. This is an airborne assessment team consisting of 12 Air Force CRG personnel capable of FW or RW air-land infiltration and airdrop or overland employment into a bare-base location. The 7E1AK includes a 7E1AM team, ATC, medical, and logistics readiness personnel.

e. The USAF 7E1AP. This airfield assessment team conducts worldwide airfield and site assessments to evaluate airfield capabilities in support of air mobility operations.

(1) Personnel. This team is composed of eight Air Force CRG personnel, including civil engineers, airfield management, fuels, materiel management, contracting, and a security forces NCO.

(2) Equipment. The team's equipment includes hand-carried items specific to the team's functional areas used during the survey.

(3) Deployment Methods. The team delivery may occur by FW, RW, sealift, or convoy insertion methods.

Operation DAMAYAN, Philippines 2013

Within the first 24 hours, members of the CRG assessment team linked with their Philippine counterparts to build partnerships in improving several operational areas including crowd control, air traffic control, and ramp control. Additionally, the CRG commander met up with elements of United States Marine Corps (USMC) Combat Logistics Regiment 4. CRG and USMC cross-Services efficiencies were immediately identified to facilitate operating in and around Tacloban. It was quickly determined that CRG's focus would be airfield operations, and CLR-4 elements' focus would be establishment of operational water purification units, the distribution of relief supplies beyond the confines of the airport, and oversight of bed down locations for follow-on forces. Moreover, the USMC G-4 at Tacloban conveyed that they would coordinate all resupply requirements for CRG and USMC through the chain of command.

Operation DAMAYAN, Support to the Republic of the Philippines after Typhoon Haiyan, USMC Center for Lessons Learned, 7 July 2014

f. The Air Force Civil Engineer Center (AFCEC) Airfield Pavement Evaluation (APE) Team (4F9AD). This APE team conducts worldwide contingency, sustainment, and permanent level APEs. The team uses destructive and nondestructive techniques to evaluate or assess pavement weight bearing capacity and surface conditions. Additionally, the team can proof load high-capacity aircraft anchoring systems, determine runway surface friction characteristics, and provide technical expertise and guidance to design, repair, and construct airfield pavements in support of regional conflict operations. Taskings support contingency operating locations, aerial ports, en route bases, or critical stateside bases including humanitarian relief

operations. This team also conducts the Contingency Airfield Pavement Evaluation Training Course and certifies DOD evaluators.

(1) Personnel. This team is composed of four Air Force civil engineering personnel assigned to the AFCEC.

(2) Equipment. The team's equipment includes specialized rolling stock (i.e., heavy weight deflectors, automated dynamic cone penetrometers, continuous friction measurement equipment, and anchor testing kit components).

(3) Deployment Methods. The team's equipment is C-130/C-17 air transportable or delivery may occur via sealift or convoy insertion methods.

g. JTF-PO Assessments.

(1) The joint assessment team's (JAT's) mission is to evaluate all aspects of opening deployment and distribution networks. Its two-fold purpose is to gather information to determine if the airfield and distribution infrastructure are capable of supporting the mission, and determine the availability of resources to accomplish JTF-PO assigned tasks. See appendix B for an example of the airfield assessment and survey checklists.

(2) Mission analysis for the JAT requires coordination between the air element and surface element, with the HN or seizure forces prior to JAT arrival. At a minimum, JAT planners should know the expected airflow, type of cargo, delivery mode to the forward node (FN), and operational environment.

(3) The JAT assessment should emphasize specific areas, including joint aerial port or marshalling area operations; logistics, work and living spaces, ramp and transportation route security; and access to, and capabilities of, forward distribution areas.

(4) The JAT consists of eight Air Force personnel (i.e., seven core members from 7E1AM and one augmentee), and four Army personnel (i.e., three core members from RPOE and one augmentee). Members from DLA's assessment team may accompany the JAT, as the mission dictates. See appendix I for additional JTF-PO JAT capabilities.

(5) The go/no-go recommendation by the JAT is a leadership decision made after the initial assessment, to determine:

(a) If the APOD can handle the distribution mission.

(b) If augmentation is required before operations can commence (i.e., additional security, runway repair, etc.).

(c) If additional time is needed before a decision can be made. The JAT must provide Commander, USTRANSCOM, through the deployment and distribution operations center, the go/no-go decision within 4 hours.

3. Assessment Considerations

a. Upon arrival, assessment team personnel should meet with representatives of the airfield seizure forces (if applicable), HN personnel, or designated

representatives to discuss local operating conditions, area security, and the likelihood of the airfield supporting the intended mission. In a permissive environment, the assessment activity coordination should occur through the defense attaché officer at the appropriate US Embassy or NGO representatives.

b. Appendix B depicts sample checklist items for airfield assessments. Teams should consider each listed item to assess airfield suitability. In addition to checklist items, teams also should consider assessing operations in support of the following:

(1) Medical Evacuation. Emphasis includes space available for medical treatment facilities, patient staging areas, and FW or RW patient loading areas.

(2) HA/DR. Emphasis areas include personnel staging areas, cargo hold areas, and interagency coordination.

(3) Helicopter Operations. Emphasis areas include designated clear zones, FARP placement, and helicopter LZ placement.

(4) UAS. Emphasis areas include potential UAS LZs, user requirements, and ATC deconfliction plan.

(5) Fire Missions. Emphasis areas include potential launch sites, user requirements, and ATC deconfliction procedures. Fire missions includes artillery, rockets, mortars, etc.

c. The go/no-go priorities of the assessment team depend on mission objectives and the condition of the airfield. The primary mission of the assessment team is to conduct airfield site assessments of austere or established airfields for imminent air operations. However, the assessment team also may evaluate and report the status of organic communications, facilities, fuels, pavement, force protection (FP), ATC, and overall airfield condition or suitability while establishing a minimum operating strip. If intended for use by air refueling tanker aircraft, the assessment team should factor in the ability to provide large volumes of fuel required for that operation.

d. The following are some airfield assessment priorities.

(1) Complete the assessment within 4 hours and provide a go/no-go recommendation and provide a detailed survey within 24 hours.

(2) Capture airfield capabilities and assist in collecting and validating information, including airfield suitability.

(3) Evaluate the airfield’s pavement.

(4) Establish a minimum operating strip.

(5) Assume SAA. Complete the “runway open” phase of the initial air base opening operations.

(6) Determine the capability and suitability of a forward operating location to support airfield operations and combat airpower sustainment.

(7) Make an overall force bed down assessment, including real estate available.

(8) Establish site bed down for airfield opening personnel, receive each personnel chalk, and provide an initial briefing to arriving personnel.

(9) Make a full-spectrum threat assessment, including airfield and airbase security, enemy activity or intelligence threats, terrorist threats, unexploded explosive ordnance (UXO) hazards, health threats, and environmental threats.

(10) Once completed, report assessment team findings through secure, long-range communications as directed through appropriate command channels.

(11) Provide a recommendation to appropriate decision makers on the suitability for intended airfield operations as soon as possible.

4. Surveys

a. There are many types of surveys. Table 2 depicts survey organizations and the types of surveys they conduct.

Table 2. Survey Organizations and Types of Surveys

Survey Type	STT	CRF	CC	ANG ATCS	Rotational	Marines
Landing Zone or Drop Zone	X	X[1]				X
Airfield Survey (AMC Form 174)	X[2]	X		X		X[2]
Airfield Geodetic Survey					X	
DATCALS		X	X	X		X
ESSP		X				X

Notes:
1. Limited to personnel having documented differences training.
2. Limited to combat controllers and Marines who hold an Air Force Civil Engineer Center Contingency Airfield Pavement Evaluation Training Course certification.

Legend:
ANG—Air National Guard
ATCS—Air Traffic Control Squadron
CC—combat communications
CRF—contingency response force
DATCALS—deployable air traffic control and landing system
ESSP—expeditionary site survey process
STT—special tactics team

b. Surveys are completed and reported to the tasking agency within 5 days of the survey completion date. However, it is important to note pavement evaluations conducted by CR personnel require functional review and approval from the HHQ pavement engineer. Table 3 provides a description of each type of survey introduced in table 2.

Table 3. Descriptions of Airfield Operations Surveys	
Type of Survey	**Description**
Landing Zone (LZ)	Air Force Special Operations Command special tactics teams accomplish this type of survey to support austere, unimproved landing strips, and may include an entire airfield that has unique issues. These issues can include missing navigation aids, insufficient lighting, or obstacles, that prevent it from operating as an LZ. Air mobility division tactics is the office of primary responsibility for LZ suitability issues. See Air Mobility Command (AMC) zone availability report (ZAR) or Talon Point for LZ/DZ information.
Drop Zone (DZ)	A DZ-certified person performs a comprehensive site survey to certify a location to support DZ operations. See AMC ZAR or Talon Point for LZ/DZ information.
Airfield Survey (AMC Form 174)	An AMC airfield survey is a two-part document that recommends suitability of an airfield for operations of AMC aircraft. Part 1, Airfield Suitability, provides specific information on the physical capability of the airfield to handle air mobility aircraft. Part II of the survey is a checklist designed to provide information to determine if the airfield has the facilities to support air mobility operations.
Deployable Air Traffic Control and Landing System (DATCALS)	A DATCALS survey is a siting (placement and setup) function. It involves selecting the appropriate location for the DATCALS and gathering foundational data required to support terminal instrument procedures (TERPS) design and flight inspections.
Expeditionary Site Survey Process	This is predominately a United States Air Force base operating support-integrator (BOS-I) survey process used for expeditionary site planning. It is an installation survey that looks at all facets of an installation, to including: supply, logistics, maintenance, operations, infrastructure, etc. The survey is published in a multiple chapter document which resides within the base support and expeditionary (BaS&E) database, and is supposed to be updated any time its content is changed through any survey process. Refer to Air Force instruction (AFI) 10-404, *Base Support and Expeditionary Site Planning,* for more details.

Table 3. Description of Airfield Operations Surveys (Cont'd)	
Airfield Geodetic Survey	The primary source for the Department of Defense airfield survey is the National Geospatial-Intelligence Agency Office of Geomatics. This office is responsible for gathering aeronautical data through various means including conducting geodetic airfield surveys and managing the terminal aeronautical global navigation satellite system (GNSS) Geodetic Survey (TAGGS) Program. This program provides ground truth surveyed coordinates and elevations for the aerodrome, including the runways, navigation aids, vertical obstructions, and ground-control points. This information provides highly accurate, geodetic coordinates, and elevations critical to flight safety. It also ensures a common geodetic frame of reference (i.e., WGS-84) for all air operations on an international scale. The aeronautical data collected during this geodetic survey is used for publishing airfield diagrams, developing terminal instrument procedures, and evaluating the airport imaginary surfaces for possible navigational hazards.
Airfield Pavement Evaluation (APE) Report	The Air Force Civil Engineer Center APE team personnel complete this report to support paved airfields and LZs. Refer to AFI 32-1041, *Pavement Evaluation Program,* and Engineer Technical Letter (ETL) 02-19, *Airfield Pavement Evaluation Standards and Procedures,* for more details.

5. Supporting Airfield Products

TERPS and airfield obstruction charts are two products that support airfield operations. Both rely on accurate geodetic survey data for their design.

a. Terminal Instrument Procedures. TERPS-specific data and tasking information is provided via specific Service publications. For more information see the References section.

b. Airfield Obstruction Charts. These are physical or digital analyses of obstacles on or near runways to determine if those obstructions pose a hazard to air navigation. They support waiver package development and validation. Find the published results on the applicable civil engineer map, if available or published.

6. Publishing Airfield Data

a. Multiple databases containing key airfield information currently exist. The airfield assessment or survey tasking authority must ensure an appropriate C2 entity is designated for collecting and disseminating airfield data. Additionally, identification of a primary database is essential to preclude data conflicts.

b. Review, update, and validate contingency airfield data weekly.

7. Airfield Assessments for Mobility Aircraft

a. The SAA must ensure prompt transmission of airfield assessment information to the Director of Mobility Forces and Headquarters AMC. AMC, on behalf of USTRANSCOM, maintains a continuously updated global database of airfield information. This global airfield database is contained in AMC's mission management and planning system, the GDSS.

b. AMC accomplishes destination airport suitability analysis to build and maintain the GDSS airfield database used by all Services. AMC airfield suitability assessments, also called "Giant Reports", are maintained in the GDSS airfield database. USAF major command TERPS reviews are included in AMC Giant Reports, as appropriate. AMC planners and crews review and adhere to guidance outlined in the Giant Report when doing feasibility studies and mission planning.

c. The airfield assessment team must ensure prompt transmission of airfield infrastructure information to AMC Airfield Suitability (AMC/A3AS) after arrival if mobility aircraft operations are required. Refer to the GDSS airfield database to determine suitability for mobility aircraft (i.e., C-5, C-17, C-20, C-21, C-32, C-710 37, C-40, C-130, KC-10, KC-46, and KC-135). Contact AMC/A3AS to provide data or request an airfield evaluation addition to the GDSS airfield database. Write to: Airfield.Helpdesk@us.af.mil, or call Defense Switched Network (DSN) 312-779-3112. See Air Mobility Command instruction (AMCI) 11-211, *Destination Airfield Suitability Analysis*; Air Force Pamphlet 10-1403, *Air Mobility Planning Factors*; and the AMC Airfield Suitability and Restrictions Report (accessed through the GDSS).

d. GDSS limits access to DOD (.mil) domains and requires login permissions. Register for an account by submitting a DD Form 2875, *System Authorization Access Request*. The GDSS helpdesk stateside (at DSN 312-576-4949) can assist with registration.

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Chapter III
OPENING AN AIRFIELD

Joint Task Force-Port Opening (JTF-PO) Operations in Haiti (2010)

A couple of hours after the joint assessment team (JAT) landed in Haiti in support of hurricane relief, the JTF-PO commander and main body arrived on five C-17s. The team immediately began coordinating bed down and operations efforts with the JAT, special operations forces (SOF), controllers, special tactics teams, and Soldiers from the 688th rapid port opening element. On the periphery of the busy airfield, the 26-man security force (SF) team set up a layered defense of the damaged perimeter. Due to the size of the airfield and number of people living in close proximity to the airfield, it became apparent that more SF assistance was needed. On 24 January, a squadron of SF Airmen from the 820th Base Defense Group arrived and began working alongside the JTF-PO defenders to secure the airfield.

The JTF-PO brought order to the parking area by controlling the flow of aircraft. A contingency response group maintenance crew chief was assigned to the SOF special tactics teams and directed aircraft ground and air traffic. Within a day, this logistical solution doubled the number of aircraft transiting the airfield. Due to the myriad of aircraft supporting the relief effort and a lack of compatible ground handling equipment, foreign aircraft were often unloaded by hand.

SOURCE: MAJ Armando Velasquez
690th RPOE Commander, 2010

1. Overview

Integrate subject matter expert (SME) planners into the process as early as possible when developing and rehearsing operations that may include an airfield opening. The planning process must incorporate planners versed in the mission and aircraft expected to operate out of the opened airfield. Planning for an airfield opening begins at the strategic level of force assignment. The plan should address options for one of the three operational environments: permissive, uncertain, or nonpermissive. Upon force assignment, detailed planning must occur coordinated with initial entry forces. CCDRs identify airfields for use and direct their staffs and subordinate commands to generate plans, based on whether the airfield is in a permissive, uncertain, or nonpermissive environment. Once the plan has been finalized the airbase will be seized or secured initiating the airfield opening process.

2. Planning Factors

a. Tailor airfield opening activities to the mission of the airfield and operations that the airfield is supporting. Commanders must get a clear statement of priorities and future intent, from combatant and subordinate commands, to ensure they shape the airbase to those roles.

b. Airbase opening activities take place in three general phases. The phases are: Runway Open, Airfield Open, and Airbase Open. The duration of airbase operations is critical in determining the level of development required for the facilities and

capabilities. Operations lasting a few hours do not require the same activities that an enduring airfield will require. Tailor the plans to the duration of the mission. See figure 1 for the phases of airbase opening.

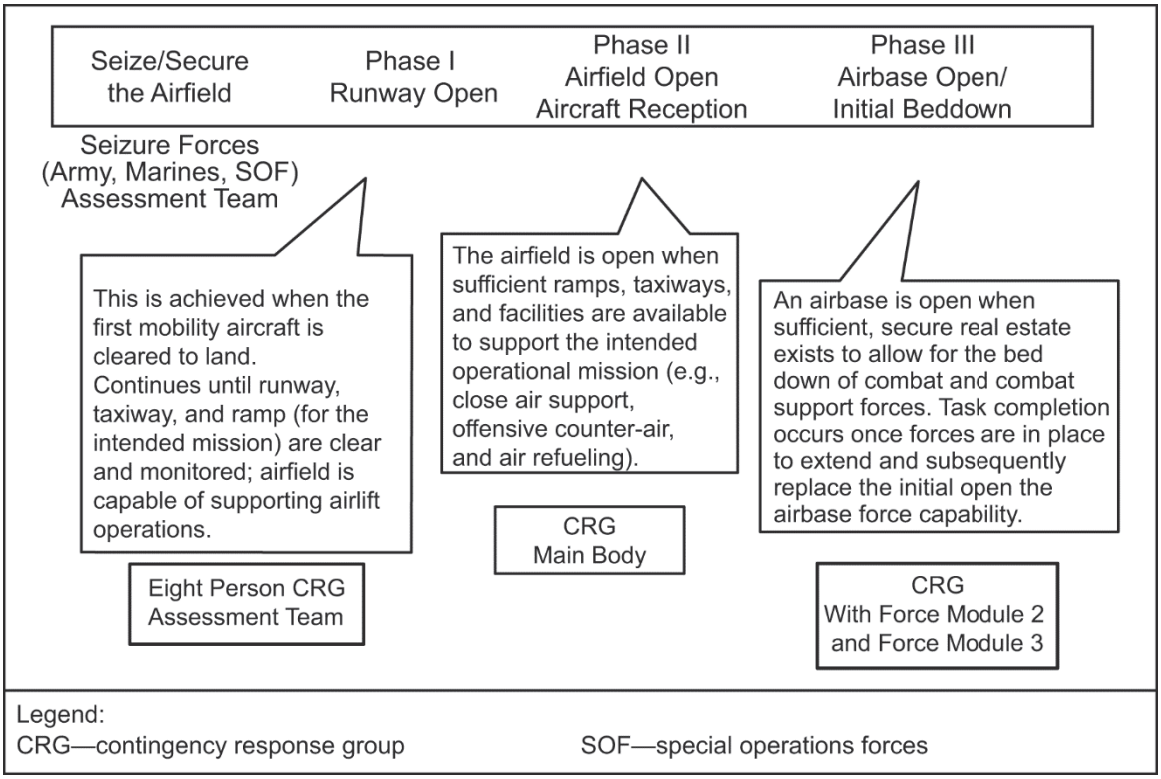

Figure 1. Phases for Opening an Airfield

c. Different organizations will provide different capabilities. Each Service's capabilities are broken down in appendices E-H. Command of an airfield and command relationships will change based on the Services chosen to open an airfield and the unique capabilities and cultures each uses to accomplish this mission. Each Service has unique organizations and systems for opening an airfield, but the required tasks are fundamentally the same.

d. Airfield opening tasks can be broken into three general categories, airfield operations, airfield support, and airfield sustainment. The responsibility of these tasks will be divided between SAA and the BOS-I.

e. Airbase opening operations must consider the physical, human, political, cultural, and threat geography of where those opening the airfield will be working. An initial transfer could span between a friendly governmental or HN agency and a seizure force.

f. In a permissive environment, forces may take responsibility for, or assume control of, the airfield (or portions of the airfield) as arranged with the HN or governmental agency. Coordination with the US Embassy, HN, and local authorities is critical for mission success in this environment.

g. Some environments may require area or site seizure. Such operations may include airborne, amphibious, or air assault forces that should remain in place until

relieved by airbase opening forces. Planners must ensure the airspace is managed and aircraft are controlled after landing (e.g., parking locations and taxiing control). This helps Services accomplish their tasks. Tailor requests for forces to the capabilities of these units as outlined in Service appendices. Special forces, pathfinders, and some others can be inserted ahead of the force as part of a joint airborne advance party; they can jump with the airborne assault or land with the first assault aircraft. Others will flow in behind the seizure force and replace or expand seizure force capabilities.

h. SAA transfer to the oncoming force occurs after the oncoming force is capable of maintaining airfield security. Airfield opening planners should be involved with seizure planning to expedite this transfer.

i. After assuming control, the SAA is responsible for all airfield operations and coordinates area security requirements with the appropriate authorities. The SAA is responsible for assessing and validating the airfield and airfield-opening plan.

3. Command Relationships

a. Building Command Relationships. Military command relationships can be complex. For example, OPCON of continental United States (CONUS)-based CRGs remains with USTRANSCOM even when supporting another CCDR. Coordination with the geographic CCDR or HN also may be required to establish support and define mission needs. Liaisons can help maintain communication.

b. Airfield Command and Sustainment. Command of airfield opening forces will vary based on mission, forces, and time. The mission of the airbase will drive who retains OPCON and tactical control (TACON). Short duration missions, with organic support, will not drive the same command relationship as a JTF-PO shaping an airbase for an enduring mission. The command relationships will change over time as the mission matures. Key organizations include the combatant commands and JTFs. Solidify command relationships early in the planning process and ensure they are clearly defined in operational orders. Commanders must understand, they will have to negotiate among all mission owners to develop a command relationship that works for a specific mission. A thorough understanding of joint and Service doctrines, use of liaisons, and regular joint training are valuable in developing a command relationship in a compressed timeline.

(1) OPCON. Operational control of forces will vary by mission duration and unit ownership. For example, for a FARP or raid mission, the unit's commander may maintain OPCON. This holds true for missions lasting between 1–14 days. For missions lasting 14–60 days, the OPCON may transfer to a JTF or similar authority. Missions lasting more than 60 days, or missions originally planned to establish an enduring airbase, would fall under the JFACC for OPCON of the airfield opening forces. It is critical that the execute order (EXORD) clearly define supported and supporting commands. Verbal orders also should include these authorities.

(2) TACON. TACON delegation will occur per joint and Service doctrine. Critical to TACON considerations will be HN abilities and authorities. The authorities on

airfield operations that the HN maintains may restrain the SAA's authorities considerably.

(3) Sustainment. Sustainment is primarily the responsibility of the supported GCC and subordinate Service component commander in close cooperation with Service, combat support agencies, and supporting commands (JP 4-0, *Joint Logistics*). In situations where a GCC does not have administrative control (ADCON), OPCON, or TACON of a force, the parent command should create an agreement with the GCC for force sustainment, either through a memorandum or in the EXORD. The on-scene commander will have to develop a positive working relationship with the geographic combatant command's logistics leadership and the forces driving them. Relationships are critical to overcoming unforeseen circumstances and dealing with high-visibility problems, like casualty reporting, where multiple commands will want to be informed and may have a specific process for an event's resolution.

c. SAA. The exact delegation and sharing of authorities will depend on the situation and forces available. Plan the mission with a good breakout of authorities; but consider, the SAA may have to negotiate with interested parties once on the ground and gaining situational awareness of the ground truths. In situations where US forces are not the overarching authorities for airfield operations (e.g., the HN maintains airfield control, or it is an operational civil airfield), the SAA maintains oversight for all US or coalition airfield operations and, is the primary negotiator with the airfield officials for any support required. (See JP 3-17.)

(1) The SAA is responsible for all aspects of airfield operations and should be allocated resources and personnel to conduct operations. Cooperative efforts of HN and coalition and joint forces may meet some or all of these needs. Request force augmentation or additional support, as required, to support air operations (i.e., ATC, civil engineer, BOS-I, etc.). The SAA should maintain TACON of any units conducting airfield operations, including STTs, Marine air traffic control mobile team (MMTs), Army tactical aviation control team (TACT), and Navy tactical air control squadron units while they operate on the SAA's airfield. Due to the specialized nature of some of these units' missions and the complexities of conventional forces having TACON of SOF forces, the SAA is encouraged to communicate command relationship needs to the GCC.

(2) If dual-hatted as the base commander, the SAA has control and direction over base defense activities within the base boundary through the C2 mechanism of the base defense operations center (BDOC). (See JP 3-10*, Joint Security Operations in Theater.*) The base commander, through the BDOC, addresses threats with attached forces within the designated base boundary, coordinates with the designated area commander(s) for additional support or forces, and (if required) requests joint fires within the base boundary. Within this context, clear lines of authority are required to ensure personnel and resource protection from ground-based and standoff attacks commensurate with the commander's integrated base defense plan. (See JP 3-17.)

(3) The SAA and BOS-I Relationship. The working relationship between SAA and BOS-I is critical to determining the success of an airbase opening. The BOS-I and SAA should meet regularly to coordinate their activities. These meetings should be daily at the beginning of a mission and can be weekly as each gains an appreciation of the other's mission and priorities. Whenever there is a change of SAA or BOS-I, execute daily meetings to establish a good relationship between the new leaders. Any parties with interests that effect SAA and BOS-I should attend these meetings (e.g., engineering, security, ATC, or logistics).

d. Transition and Establish Authority. Ensure a positive transition of authority from seizure forces or integration with HN or existing authorities. Transferring responsibility should happen when the incoming force can meet or exceed the existing force's capability. The SAA must establish a position in the local command structure.

e. Build HN Relationships. Navigating these relationships can be challenging and impact operations if not clearly understood. Build relationships with the local embassy, diplomats, or other HN officials to facilitate coordination on concerns, such as overflight and access agreements or arrangements that suit the foreseeable period of operations.

f. HN and SAA. In situations where the HN retains control of the airfield, it still may be desirable to appoint an SAA. The SAA must have a good working relationship with HN airfield managers that is built on trust and expertise. The SAA is responsible for coordinating all US military flight operations and movement procedures, and becomes the single clearinghouse between the HN airfield managers and any US military airfield users. All US military operations on the airfield and any improvements or changes to the airfield should be coordinated through the SAA and transmitted to the HN airfield manager to ensure HN buy in and approval.

"When I stepped off the aircraft at Port-au-Prince [Haiti] there was no one there who knew we were coming. I immediately asked for directions to the office of the airport manager and then began introducing myself as the JTF-PO [joint task force-port opening] airfield management and ATC [air traffic control] expert at every office I walked past until I was taken to the Chief of Airfield Operations' office. Once there, we sat down and started talking about how we should work together. From then on, I informed him and his offices everything that was happening on the airfield."

— Capt Andrew T. Schnell, United States Air Force, Airfield Manager for Joint Task Force-Port Opening MATTHEW

g. Partner Service Mobility Liaisons.

(1) Air mobility liaison officers (AMLOs) are rated USAF mobility air forces officers selected, trained, and equipped to assess, train, advise, and assist mobility air forces and ground force integration for air movement and sustainment. They integrate with supported joint force component staff functions at the echelons that make decisions for air movement and sustainment planning, validation, prioritization, preparation, and execution. AMLOs are organized to advise ground force commanders on air mobility issues and are granted

coordinating and direct liaison authority to provide essential coordination and enhance the interoperability between the global mobility enterprise, supported combatant commands, joint force partners, and other authorized mobility users in garrison and forward deployed. AMC's AMLOs are forces assigned to USTRANSCOM. The Air Force transportation component retains OPCON, and the contingency response wing has ADCON responsibility.

(2) Ground liaison officers (GLOs) are US Army liaison representatives assigned to contingency response organizations in support of air mobility operations. GLOs provide Army expertise to Air Force organizations by analyzing and briefing the ground tactical situation to contingency response personnel before and during operations.

4. Functions

a. Airfield Operations. Airfield operation forces, during expeditionary military operations, require tactical-level procedures to provide a unity of effort supporting the JFC. Integrate air assets from across the Services to achieve operational success. The following paragraphs serve as guides to execute airfield operations. See appendix C for an airfield operations checklist.

(1) Airfield Systems. Responsibilities include NAVAIDS, arresting gear, and lighting.

(2) Airfield Management. Airfield managers survey or assess airfield conditions to determine suitability for future aircraft operations. Managers develop aircraft parking plans and determine parking MOGs. For detailed information refer to appendix K or the Unified Facilities Criteria (UFC) 3-260-01, *Airfield and Heliport Planning and Design*. The following are airfield layout considerations.

(a) Runways.

- Consider the type of runway surface available for the required mission, such as unprepared or semi-prepared surfaces (e.g., grass, dirt, and matting) or prepared surfaces (e.g., asphalt or concrete).
- Assess the weight-bearing capacity and surface conditions required on a continual basis. These should be based on the type of required aircraft.
- Periodically, engineers should assess the runway to determine its capacity and feasibility for sustained operations.
- Conduct runway inspections daily to ensure a safe airfield environment.

(b) Taxiways. Ensure proper control procedures exist for ground aircraft movement and deconfliction. Update procedures if the taxiways are opened or become available.

(c) Ramp Parking. Consider the size of the parking area in relation to the number of required aircraft. Coordinate, establish, and publish an aircraft parking plan.

- MOG. See JP 4-01.5, *Joint Terminal Operations*.

- Working MOG. Determine how many aircraft can be loaded, receive maintenance, or refueled simultaneously.
- Parking MOG. Determine how much physical space is available by size and type of aircraft.

(d) Hazard Area. Identify and mark hazards.

(e) Crossing Areas. Coordinate with the airfield manager and ATC to establish crossing procedures for runway and perimeter roads.

(f) Frangibility and Clear Zones or Areas. Review and establish criteria based on mission requirements.

(g) Lighting or Approach Systems. Establish runway, taxiway, ramp lighting, marking, NAVAIDS, and approach systems based on mission requirements.

(h) Emergency Landing Surface Operations. Airfield operations may experience loss of the primary landing surface due to an unplanned event (e.g., dual barrier engagement or enemy action). Develop emergency landing surface procedures to ensure there are continuous airfield operations supporting the joint force.

(i) Considerations for using a taxiway as an alternate runway.

- Obtain the appropriate command approval.
- Coordinate with airfield management and the tower supervisor.
- Move all arming and de-arming areas at least 100 feet from the alternate runway.
- Have ground control direct taxiing aircraft to clear the taxiway and hold all others in parking areas.
- Visually, ensure the taxiway is clear.
- This is only for daylight operations or time-critical missions.
- The taxiway is only for straight-in approaches.
- There may be a displaced threshold.
- There may be obstructions near the taxiway.
- A taxiway is narrower than a runway.
- There is a rapid deterioration of the taxiway's surface.
- Taxiway lighting and markings are different than for a runway.

(3) ATC. ATC units must remain operationally creative, within regulatory guidelines, to ensure the full range of capability is available to support the JFC.

(a) UAS Operations. ATC should prepare to modify deconfliction procedures used within the national airspace system. Procedural deconfliction will transition to real-time deconfliction within the assigned airspace due to expeditionary UAS operations.

(b) Counter-rocket, Artillery, Mortar (C-RAM) Operations. These operations likely share the operational environment with ATC units. The C-RAM is designed to integrate a variety of capabilities and assets to defeat indirect fire efforts. Rapid action to defeat indirect fire may limit ATC units' reaction time and their operations. It is critical that ATC units maintain situational awareness on operations to deconflict fire with flying activities and ensure ATC operations do not inadvertently preclude or block C-RAM efforts. Close coordination with the BDOC will allow ATC units to integrate with the appropriate C2 feed and receive the quickest possible warning prior to interception. See figure 2 for the C-RAM operational tenets.

(c) Deconfliction of Surface-to-Surface Fires. Coordination with ground forces to deconflict surface-to-surface fires must be accomplished to ensure safe, orderly, and expeditious air traffic flow and timely fires clearance.

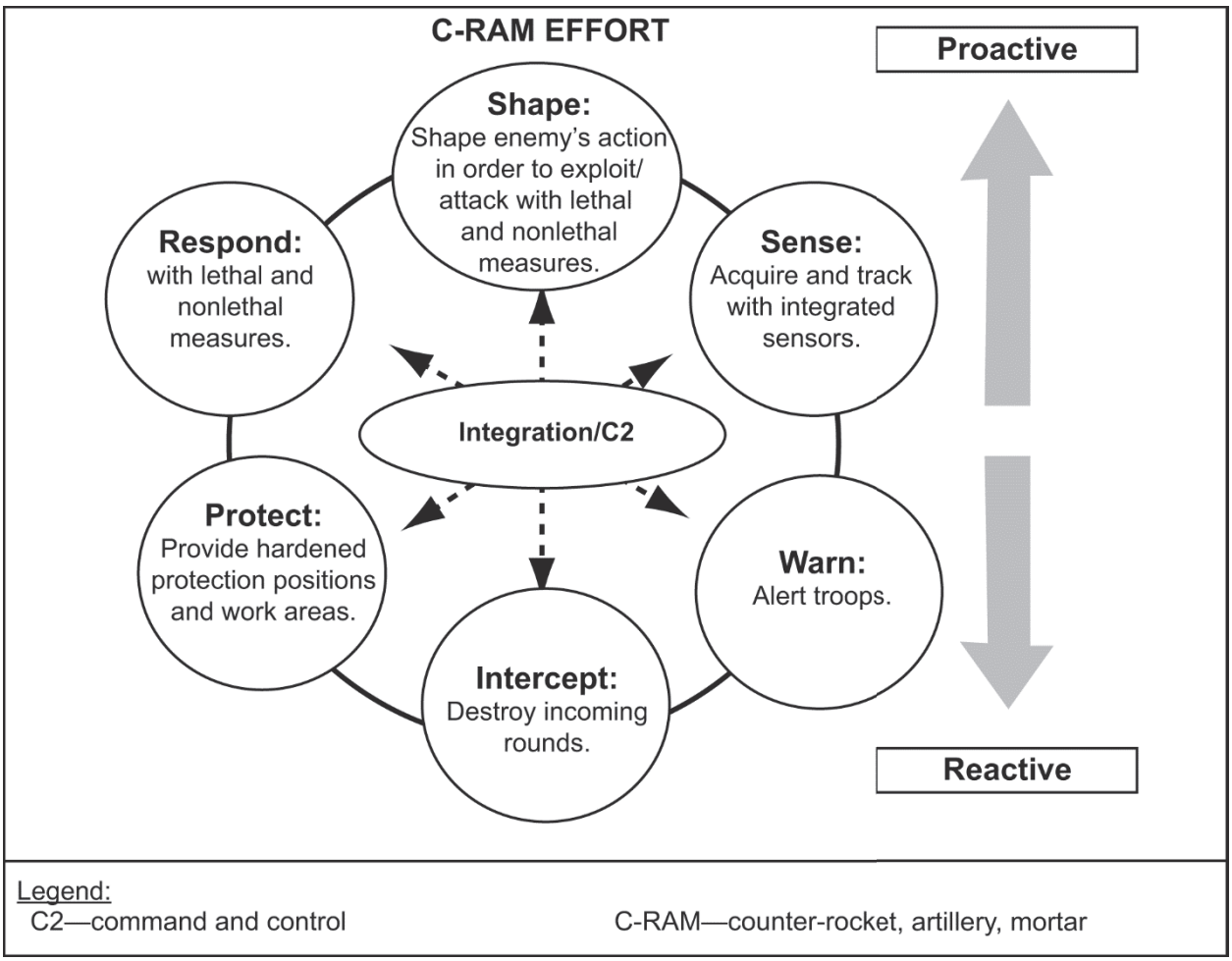

Figure 2. C-RAM Operational Tenets

(d) Communications Out/Emission Control (EMCON) ATC Operations. During these procedures, aircraft operations may require alternative communication procedures between the aircraft and airfield ATC. In most instances, these prebriefed procedures use light signals for communication between the control tower and aircraft. An alternative uses airport vehicles

vice lights. The tower communicates with a vehicle using low powered, handheld radios, and the vehicle blocks or gives way to the aircraft based on permission to restrict taxi or allow takeoff. The vehicle method allows more positive control on high-tempo airfield traffic. These procedures require close coordination between the tower and aircrew for mission accomplishment. Table 4 is an example of communications out/EMCON procedures.

Table 4. An Example of Communications Out/EMCON Procedures

If back taxi is required or safety is in doubt, cancel communications out/emission control (EMCON), and crews should resume normal communication procedures. Request a restart of these procedures at any time by making a request with the ground/tower (i.e., "Midas 20, resume communications out/EMCON").

Once airborne, resume communication with air traffic control.

1. Provide the following information to airfield operations no later than two hours prior to takeoff:
- Call sign, number, and type of aircraft (i.e., Midas 20, four F-15Es).
- Tail numbers.
- Start, taxi, and takeoff times.
- Runway line-up procedures.

2. Make start, taxi, and takeoff times on time or up to five minutes late. After engine start, request time changes with operations (refer to the original time).

3. Flight leads will accomplish a radio check with operations using the tail number; and obtain routing clearance by telephone prior to step, secure, or in the clear with ground using the tail number.

4. All flight members will monitor ground, tower, and departure frequencies.

5. During a large force employment, a representative from air traffic control will attend the mass brief.

6. When the communications out/EMCON launch light signals, display a steady taxi or landing light at the tower when the aircraft is ready for takeoff.
- Steady Red: Stop.
- Flashing Red: Taxi clear of active runway.
- Steady Green: Cleared for takeoff.
- Flashing Green: Cleared to taxi.

(e) Reduced Same Runway Separation. The sequential nature of military operations, coupled with the limited number of airfields, highlights the need to achieve and maintain a peak level of operation into a busy airfield or airspace. Using reduced runway separation (i.e., allowing aircraft to land in proximity to other aircraft) increases overall traffic flow into a congested airfield. See FAA Order JO 7110.65, *Air Traffic Control* for additional information.

(f) Randomized Arrival or Departure Procedures. Terminal ATC procedures in a high-threat situation can enhance aircraft survivability. A sector, or wagon wheel, overlay divides the airspace into eight 45-degree sectors starting at 5

nautical miles (nm) and continuing in 5 nm increments, out to 15 nm, or whatever number of sectors and mileage is deemed appropriate (figure 3). Designate sectors using an alpha-numeric system that is changed regularly and published within the special instructions (SPINS) of the current air tasking order or airspace control order cycle. The frequency of changes is based upon the threat activity level. The sectors are aligned with existing runways or helipads on the airfield and allow aircraft freedom to maneuver below the established coordinating altitude. Sectors and control become more restrictive the closer aircraft are to the airfield. Using sectors and landing pads eliminates the need for traffic or holding patterns. Aircraft report crossing each phase line (5 nm increments) of the sector until aircraft are cleared to land. Position calls enable traffic advisories and procedural separation by controllers and eliminates the need for runway use by RW traffic in situations where a large volume of FW air traffic exists.

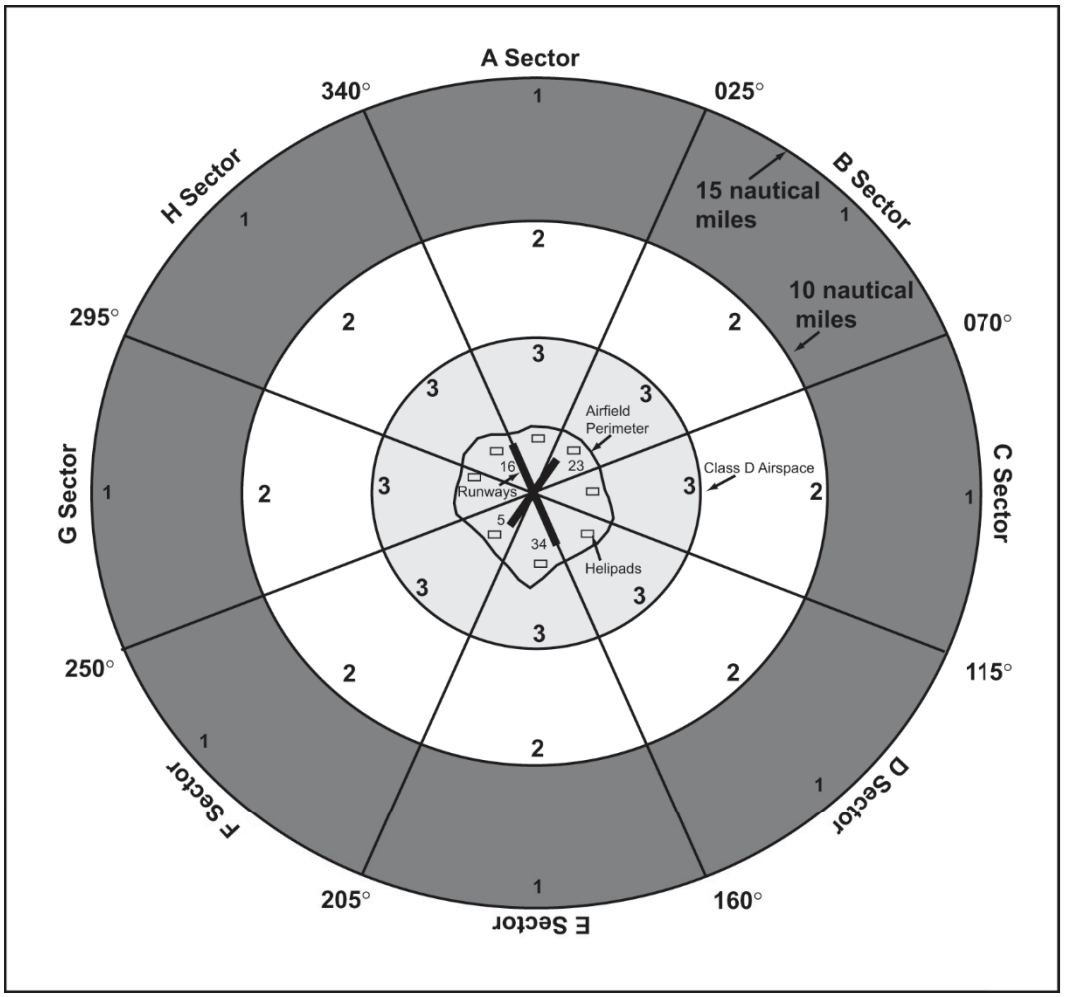

Figure 3. Depiction of Randomized Arrival/Departure Procedures

(g) Aircraft Traffic Patterns During Tactical Operations. Increase aircraft survivability in the terminal phase of flight operations by modifying and randomizing aircraft traffic patterns. For more information, see FAA Order JO 7400.2, *Procedures for Handling Airspace Matters*.

b. Other Airfield Support. The following list shows support required for executing additional airfield operations. See appendix C for more information.

(1) Cargo or Passenger Handling.

(2) Aircraft Maintenance and Ground Equipment. Plan for initially austere, limited capabilities, to full maintenance support after arrival of sustainment forces.

(3) Safety. Provides ground, flight and weapons safety oversight.

(4) Aircraft Rescue and Firefighting (ARFF). ARFF depends on vehicles, an agent, and personnel available to conduct operations.

(5) Munitions and Ordnance.

(6) Weather Support. The initial deployed weather capability provides basic airfield-focused weather services consisting of weather observations, warnings, and advisories. A theater weather support unit provides theater-focused weather forecast products; weather watches, warnings, and advisories; and other services.

(7) Airfield Engineer Forces. Engineer units should accompany the assault force. Their task is to clear runways of obstacles. The type and quantity of obstacles on a runway demand special consideration. These obstacles have a major impact on engineer assets required by the task force, the time for clearance, and the planned time of arrival of air-land sorties. The initial assault may include airdrop bulldozers and handheld mine detectors to assist engineers. Assault forces should consider training select personnel to hot wire indigenous vehicles and airfield support vehicles required to assist an offload. Once the assault echelon has seized initial objectives, runway clearance teams (i.e., engineers, explosive ordnance disposal (EOD), and other designated personnel) begin clearing or repairing the runway(s). See appendix H for unique engineer capabilities.

(8) Support Functions. The following are recommended airbase support functions for integrated operations.

(a) Contracting. Provides oversight, execution, and closeout of any contracts with HN, nongovernment agencies, and joint Services. They should be a first in and last out capability. They must have ability to terminate or transfer contracts prior to retrograde or redeployment

(b) Finance. Provides financial expertise, funding oversight and Service member financial support.

(c) Medical Services. Provides medical care for tenant units. Aviation and flight medicine staff are necessary for aviators and aircrew personnel. Refer to JP 4-02, *Health Service Support,* for more information.

(d) Supply. Provides oversight and management of supply classes.

(e) Communications. Provides internal and external communication support and oversight for the communications working group to integrate or deconflict as required.

(f) Fuel Services. Provides aviation and ground fleet petroleum, oil, lubricants; other specialized equipment fuel needs; fuel testing; and defueling services.

(g) Morale, Welfare and Recreation Services. Provides morale, welfare and quality of life resources.

(h) Personnel. Provides personnel accountability, casualty reporting, and personnel control operations.

(i) Religious Support. Provides direct religious support and advisement for command and staff on the impact of religion, ethics, morals, and morality.

(j) Vehicle Fleet Management and Maintenance. Provides oversight, accountability and maintenance of nontactical and tactical vehicle fleets.

(k) Intelligence. Provides geospatial planning and support; intelligence analysis; and intelligence, surveillance, and reconnaissance operations.

(l) Legal. Provides legal advice, to the commander, on rules of engagement and the Uniform Code of Military Justice.

(m) Public Affairs. Provides public communications, command information, audiovisual documentation, and community and key-leader engagement support to the airfield commander.

(n) Force Protection. Provides oversight of defense forces, conducts liaison with HN and coalition partners, prepares and coordinates base defense plans with the SAA and support agencies, and implements physical security measures, coordinating deviations from standards with HHQ FP directorate.

(9) Establishing Airfield Security. Airfield opening forces can have some organic security for airfield access control and limited self-defense. However, expansion of FP services for the airfield, base perimeter, base security zone (BSZ), suppression of enemy air defense and patrols for indirect fire standoff often depend on additional forces.

(10) Security Measures.

(a) Airfield physical security is integral to protect forces and equipment. Physical security measures are designed to deter, detect, delay, defend, and defeat threats from terrorists, criminals, and unconventional forces. These measures include:

- Fencing and perimeter standoff space.
- Lighting and sensors.
- Vehicle barriers.
- Blast protection.
- Intrusion-detection systems and electronic surveillance.
- Camouflage, concealment, and deception.

(b) Procedural measures protect US personnel and equipment regardless of mission or geographical location. Procedural measures include:

- Security checks.
- Training and awareness.
- Property accountability and inventory requirements.
- Physical security inspections of mission essential or vulnerable areas.
- Physical security surveys of installations.

(11) Airfield Defense.

(a) Airfield defense requires a dedicated security force coordinated with a BDOC. The airfield may house a base-cluster commander, or it may be a cluster itself. A dedicated security force is responsible for the airfield's base BSZ, suppression of enemy air defense and patrols for indirect fire standoff. Its internal defense is primarily the responsibility of the quick reaction force (QRF) and Security Forces assigned to the airfield. The QRF provides in-depth defense for weapons, weapons systems, command centers, personnel, and other priority resources established by the base commander.

(b) When the threat exceeds the capability of the assigned airfield security force and QRF, the base commander requests FP assistance through the base cluster operations cell. The base cluster operations cell is the Army maneuver enhancement brigade responsible for or the joint security areas' joint security coordination center. (See JP 3-10).

(12) Base Defense Plan.

(a) The SAA provides assistance in developing and implementing comprehensive defense plans to protect the airfields. The defense plan includes measures to deter, detect, delay, and defeat Level I and Level II threats.

- Level I Threat. A small enemy force that can be defeated by those units normally operating in the echelon support area or by the perimeter defenses established by friendly bases and base clusters. Level I threats include enemy agents and terrorists whose primary missions include espionage, sabotage, assassination, and subversion. These include a potential for insider attacks by elements or individuals of HN partners and security forces, often characterized as green-on-blue.

- Level II Threat. An enemy force or activities that can be defeated by a base or base cluster's defensive capabilities when augmented by a response force. Level II threats include small-scale forces conducting irregular warfare that can pose serious threats to military forces and civilians. Attacks by Level II threats can cause significant disruptions to military operations and the orderly conduct of local government and services. Forces constituting Level II threats are capable of conducting well-coordinated, but small-scale, hit-and-run attacks; improvised

weapons attacks with roadside or vehicle-borne improvised explosive devices; raids; and ambushes. These forces may employ significant standoff weapons threats, such as mortars, rockets, rocket-propelled grenades, and man-portable air-defense systems.

Note: See Army techniques publication (ATP) 3-91, *Division Operations,* for more information on threat levels.

(b) To maximize mutual support and prevent fratricide, the SAA or base commander will assist in deconflicting defense plans with adjacent base and base clusters, and joint, multinational, and HN forces. The base commander must ensure proper integration of defense plans into the overall base and joint forces' security plans. SAA airfield defense responsibilities include:

- Developing and monitoring unit training as it relates to the base defense plan.
- Participating in base defense planning.
- Providing, staffing, and operating base defense facilities per base defense plans.
- Conducting individual and unit training to ensure force readiness in defense of the base.
- Providing appropriate personnel to the BDOC.
- Providing liaison personnel to advise the base commander on matters unique to the airfield.
- Providing communications systems, including common-user communications, within the command.

c. Establish the Airfield Layout. (See appendix K for more information.)

(1) General. When arriving at an airfield, the SAA, airfield assessment team, and airfield management personnel should consider the operational needs of current and future aviation units, the tactical requirements for the mission, and any hazards and risks associated with contingency airfield operations. Upon identification of risks, the base commander begins the process of mitigation to ensure the airfield expansion can occur safely and meet the needs of the using force. Certain regulations will dictate the criteria used for airfield opening and follow-on operations. This may require formal safety waivers and risk mitigation at varying leadership levels, depending on the size of the force and the nature of the tactical mission.

(2) SAA Requirements. The SAA must proactively seek an airfield manager or operations officer with airfield management and opening experience to ensure safety requirement implementation.

(a) Preserve Usable Pavement. Airfield pavements (e.g., runways, taxiways, aprons, etc.) capable of supporting aircraft movement and parking are scarce and finite resources. As such, the use of airfield pavements for non-aircraft

related activities (i.e., cargo storage, maintenance and support facilities, etc.) should be limited to the maximum extent possible.

(b) Prioritize Flight Line Functions and Placement. Certain functions need immediate flight line access for mission accomplishment, while some can support operations further away from the flight line or from the base-support layer. Depending on the mission, some critical functions can provide support, fully, from just off the flight line (e.g., life support, EOD, maintenance, flight operations, etc.). Some other functions, such as ARFF, require immediate access to the airfield. In some cases, physically splitting a function may be the best solution. For example, locate aeromedical evacuation adjacent to the ramp and in the main medical center support section.

(c) Place Support Facilities. Determine the placement of critical airfield support facilities. FARP, arm/de-arm pads, and munitions storage areas are hazardous and should not be located in the approach or departure areas of the runway or helipad, or near high-population areas and facilities. In addition, arm/de-arm headings should be positioned in a safe direction.

(d) Plan Explosive Routes. Coordinate explosive delivery routes to limit entry control points and minimize personnel and aircraft exposure.

(e) Plan Ammunition Storage. Ammunition storage requires a minimum safe distance from facilities and other munitions depending on the net explosive weight and type of munition. In addition, there are rules concerning hazards of electromagnetic radiation to ordnance which must be followed per MIL-HDBK-240, *Hazards of Electromagnetic Radiation to Ordnance Test Guide,* and DOD 6055.09-STD, *DOD Ammunitions and Explosive Safety Standards*.

(f) Know Airfield Criteria. Establish and enforce airfield criteria. All airfield construction and airfield support sighting should be coordinated with the SAA to ensure they do not encroach on runway, taxiway, or apron clear zones. The airfield manager can determine the airfield planning and design criteria to apply to the airfield (UFC 3-260-01). See UFC 3-535-01, *Visual Air Navigation Facilities*, and ETL 09-6, *C-130 and C-17 Landing Zone (LZ) Dimensional, Marking, and Lighting Criteria,* for additional airfield technical requirements.

(g) Manage Expansion. The SAA should develop an airfield master plan that captures requirements for planned airfield expansion and potential additional bed down. Installing airfield matting (i.e., airfield matting second-generation (AM2)) may enable temporary taxiways, runways, and parking area expansion.

(h) Determine Dispersal Distances. UFC 3-260-01 is the source document for joint airfield criteria. Civil engineers and airfield managers plan airfield and camp layouts taking into account all factors and Service guidance (such as Air Force Pamphlet 10-219v5, *Bare Base Conceptual Planning*).

(3) Required Assessments Implementation. Continually assess the airfield's weight-bearing capacity and surface condition based on the aircraft type required

for mission accomplishment. Periodically, engineers should assess the runway to determine its capacity, and feasibility for sustained operations.

(4) Austere or Expeditionary Condition Preparations. Preparation of temporary airfield surfaces provides the SAA with immediate runway and parking solutions for supported aircraft (manned or unmanned). Soil and ground preparation analyses are critical to install and certify AM2 matting, expeditionary lighting, and arresting equipment.

(a) The Marine Corps uses AM2 matting to construct runways, taxiways, parking areas, vertical short takeoff and landing expanses, and vertical takeoff and landing pads. AM2 matting is suitable for all FW, RW, and tilt-rotor aircraft in the USMC inventory. AM2 is also suitable for C-17 operations. All AM2 matting will be installed and certified in accordance with NAVAIR Instruction 13800.12 Series, *Certification of Expeditionary Airfield AM2 Mat Installations, Aircraft Recovery Equipment, Visual or Optical Landing Aids, and Marking or Lighting Systems*; NAVAIR 51-60A-1, *USMC EAF Surfacing Systems and Accessories*. Assembling AM2 to accommodate these applications requires a number of special pieces (e.g., connectors, key locks, spacer mats, and adapters) not used for an AM2 patch. Many applications require anchoring or staking to stop vertical and horizontal movement. Install and test anchors and stakes in accordance with NAVAIR 51-60A-1.

"…The few minor airfield operating considerations that we had during predeployment training were with nacelles and being non-compatible with some of the surfaces that we have in some of our zones. You can't go into helo matting, it can't go into mobi-matting but it can land, obviously, on AM2 (airfield mat 2nd generation) matting. Those were all addressed prior to the unit arriving. There are no concerns that haven't been looked at, scrutinized, and thoroughly addressed during the deployment or post deployment stage."

— LtCol Kurt Diehl, Assistant G3, 2nd Marine Aviation Wing

(b) USAF. The extruded aluminum alloy matting, designated as AM2, has been in the Air Force inventory for almost 40 years. Once the mainstay of rapid runway crater repair, it is now mostly relegated to a secondary use for taxiway repairs and parking apron expansion. However, it represents a viable option for runway repairs if other methods are not possible. AM2 mat repair must meet the repair quality criteria for its location on the runway. The following limitations apply.

- AM2 mat repair kits are acceptable for fighter aircraft and C-130s, but are inadequate for jet cargo aircraft landing strips. This limitation is due to the inadequate anchoring system, narrow patch width (16.5 meters wide by 23.6 meters long (54 feet wide by 77.5 feet long)), and susceptibility to jet blast from outboard engines.
- AM2 mats may be used to repair taxiways and aprons if braking and tight turns are limited on the mat. Adequate drainage of the base and subbase layers is important. Excess moisture in these layers will cause a

reduction in the load-bearing capacity of the subsurface material and, subsequently, mat failure.

(c) Adjacent Parking. Expand parking areas adjacent to existing aircraft pavements using expedient techniques, such as graded and compacted earth, compacted crushed stone, or AM2 matting over a compacted subbase. Once used primarily for rapid runway crater repairs, AM2 matting is now used to repair or expand aircraft parking areas. Refer to UFC 3-270-07, *Airfield Damage Repair*, for more information on AM2 matting assembly and installation.

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Chapter IV
AIRFIELD TRANSITION OPERATIONS

1. Overview

a. The transition to follow-on forces and subsequent drawdown have a significant impact on an airfield opening. Planners must consider the long-term use of the airfield in the planning phase, because the transition phase brings airfield operations from the capabilities established in airfield opening to the desired operational capability determined in planning. Planners also must consider, and provide resources for, transitioning the airfield to follow-on forces or the HN, in a deliberate manner.

b. Specialized military forces providing expeditionary capabilities at locations where operational support is insufficient or nonexistent conduct airfield opening operations. As units accomplish airfield-opening objectives, the goal is to create smooth transitions between the various phases of operations and transfers of authority to follow-on forces. When available, liaison personnel can be instrumental in ensuring seamless transitions.

c. Transition to sustained operations can occur through multiple venues: continuous military rotation, contracted service support, or returning services to the HN's responsibility. Of note, returning services to the HN's responsibility still may require oversight, assistance, or support. Establishing sustainable airfield operations capability requires significant planning to ensure appropriate resources are available to meet the JFC's requirements. Sustainment of airfield operations requires long-term ATC support.

d. Although the mission circumstances can vary greatly, transferring airfield responsibility requires detailed and deliberate planning. Functional transitions occur over time as follow-on capabilities match or exceed existing capabilities. Ideally, transitioning organizations (i.e., Services, agencies, or nations) use standardized checklists. Appendix D is an example of a joint capability-based transition checklist to guide transition operations.

2. Preparation

a. Establish a Timeline. Timelines provide a template and an execution order to facilitate an orderly transition of equipment and airbase operations from airfield opening forces to follow-on forces. Timelines will focus on sustaining capabilities throughout the transition.

b. Organize Equipment Transitions. Equipment availability and support requirements are key planning factors in determining the airfield operations requirements. Reconstitute equipment used in support of airfield opening during turnover with follow-on forces to make the equipment available for future tasking. Functional SMEs determine the order of equipment teardown for their individual area of operations to ensure mission continuation. Transferring equipment to follow-on forces should be reserved for extreme circumstances to preserve a rapid-response airfield opening capability.

c. Synchronize. The infrastructure necessary to support follow-on equipment must be in place prior to transition. Replacement parts and trained maintenance technicians are Service specific and, often, equipment specific. Sustainable operations require in-place base support (e.g., power, supply, communications, and force protection personnel). For ATC, setup times may vary from hours to days, depending on the weather, equipment deployed, and availability of flight check aircraft. Increasing capabilities may require changes to assigned airspace, and must be coordinated with the aircraft control agency and the HN.

d. Ensure Interoperability. Current DATCALS of one Service may not be fully compatible with those of other Services, coalition partners or HN. Consider the equipage of all aircraft operating from the airfield in determining required capabilities and services.

e. Facilitate Point of Contact (POC) Transition. Liaisons are instrumental in ensuring a smooth transition. The transition POC is a person from the deployed unit who possesses experience in, and a broad understanding of, the mission.

f. Coordinate Personnel Transition. SMEs should link up with their follow-on counterpart to pass airfield or airbase operations information.

g. Assign Functional Area POCs. Functional transitions occur as follow-on forces arrive on station. Functional area POCs and SMEs help facilitate a detailed and deliberate airfield and airbase responsibility transfer. Some liaison considerations are listed in table 5.

Table 5. Airfield Transition Liaison Considerations

Item
Aerial Port - Air terminal operations center - Passenger processing - Cargo handling
Airfield Operations - Airfield management - Air traffic control - Weather support personnel and equipment
Command and control
Communications
Logistics
Intelligence
Medical
Contracting
Civil engineering
Maintenance

3. Transition to Follow-on Forces, HN, or Governmental Agency Control

a. Functional airfield capabilities and responsibilities will transition from airfield opening when similar forces are in place to extend or expand airfield operations.

b. As soon as possible, establish specific priorities, timelines, and common checklists for integration and transition. When planning for a transition, allocate sufficient time to hand off and transfer contractual obligations and supply accounts, and foster follow-on force or HN relationships.

c. Once the transition is complete, the airfield opening force can redeploy or move forward, as required. Required airfield functions do not change after the transition. The transition is merely a change in organizations from airfield opening forces to organizations that are responsible for providing long-term airfield operations.

d. Joint Service Capabilities. Services can provide VFR and IFR service to all aircraft through mobile control towers, radar systems, and communications connectivity. Air Force and Marine ATC sustainment equipment provides complete ATC service to support a theater airbase mission but requires extensive airlift to deploy. Navy shipboard systems, with their inherent resupply and embarked maintenance, are limited by the ship's ability to remain on station and maintain the operational health of its systems. The Army provides complete service, except approach control. See appendices E–H for Service specifics.

e. Continued Responsibility. Sustained operations may not end when airfield operations' personnel and equipment completely redeploy. With HN or contracted services, the joint force still may have responsibility for oversight, quality assurance evaluation, procedures review, and HN agreements. The sustained operations phase ends when the JFC determines the mission is complete and transfers responsibility.

4. Enabling Civil Authority

a. General. During the enabling civil authority phase of military operations, place emphasis on restoring HN jurisdiction and airspace control following the operation. This phase also reestablishes the HN infrastructure and prepares forces for redeployment, while progressively transferring airfield and airspace control to HN authority. Service ATC units continue to provide airspace information and terminal services to aid the safe, orderly, and expeditious flow of air traffic until the HN can assume all ATC responsibilities. However, some airfields may require complete termination of operations due to nature of the airfield, or HN inability or desire to assume ATC responsibilities.

b. Planning Considerations. Planning for the transition back to civil ATC services or military ATC operation cessation should begin early and be continually updated. As early as possible, coordinate with HN, NGO, and JFC planners to restore or contract ATC services to relieve military ATC units. The transitioning forces should determine if improvements are needed for airfield and ATC facility infrastructure to meet ICAO standards and recommended practices.

c. Transferring Airspace Control. When an ATC agency receives a request to transfer control of airspace, the agency should consider the following:

(1) Receiving Agency. Consider the personnel and equipment to be transferred or loaned to the HN or Service during the transfer period, and associated costs.

(2) Consultation with Affected Agencies. Agencies and organizations with established procedures require notification of an impending transfer. Examples of agencies requiring notification are aviation units, fire support elements, air defense agencies, intelligence organizations, and multinational forces.

(3) Identification of the Date of Transfer. Knowing the expected date and time of transfer is critical to executing a workable plan to accomplish the transfer. Identifying the key elements of the transfer plan and liaisons with the transfer authority will minimize delays and expedite the handover.

5. Close the Airfield

a. Closure Planning. Closure planning requires a coordinated interagency effort that addresses all joint, US Government, and HN issues and concerns. In a joint operations area, the joint staff in the area of responsibility should provide overarching closure policies and procedures for all Services. The CCDR's staff will lead in negotiating HN agreements. The termination of military operations ends with a transition to civilian control. The result will be a timely, efficient, and effective closure that leaves a positive message with the HN and properly marshals US forces and equipment for future employment.

b. Drawdown. The drawdown of operations may require reversing the buildup process, including a second deployment of initial entry ATC assets who are able to operate without base support (e.g., Marine MMT, Army TACT, or Air Force STT) to allow for joint force withdrawal. End of operations will require a handover or phase-out of ATC services. Then, units may deploy ATC equipment to another location or the home station, or transfer it to the HN, as determined by higher authority.

c. Phasing and Considerations.

(1) Phases.

(a) Phase 1, Assessment and Plan Development. Inventory and determine equipment and personnel to redeploy, transfer to the HN, or remain in place. Assess actions, forces, and equipment required to accomplish the closure or transition. Produce a time-phased plan that encompasses all closing activities, while sustaining required airfield operations capabilities. Communicate the plan to all organizations involved.

- The plan should be site specific, but reflect lessons learned from previous airfield closures.
- BOS-I and SAA require consideration because different Services may be responsible for one or both.
- FP and accountability must continue until all personnel have departed.

(b) Phase 2, Execution of the Closure Plan. Redeploy non-closure related personnel and equipment. Manage infrastructure disposition.

- Direct and frequent communication will significantly benefit closure operations.
- There may be closure forces assigned from two or more branches of the US military, US Government agencies, or partner nations.
- Detailed sequencing is the key to effectively executing the closure plan.

(c) Phase 3, Final Closure Actions. Relinquish control of the airfield and complete personnel and equipment redeployment.

- Security is most vulnerable during this phase.
- Personnel accountability is vital.

(2) Risks.

(a) There may be an increased ground threat due to localized or standoff attack, sabotage, and civil unrest.

(b) Operational requirements may change during closure.

(c) There may be an accelerated timeline to close.

(d) There may be a contractor or contract default due to closure.

(3) Closing Limitations. Airfield closure requires integrating in-place forces and may include a minimal amount of closure-specific forces and equipment to execute closure processes. Closing installations must develop comprehensive local plans and dedicate sufficient personnel and transportation assets for closure functions. Most military equipment will redeploy with units or be retrograded to support reset programs. In some cases, the closing authority may only return a portion of a location to the HN authority. In these instances, the closing authority would consider the location “partially returned,” and it will remain usable as an operational platform. This may involve turning over responsibility to the HN authority for base operating support, in accordance with proper international agreements.

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Appendix A
AIRFIELD PLANNING CHECKLIST

This appendix provides a planning checklist to ensure the joint force has thought through all the required detail described in chapter 1. Table 6 is the planning checklist.

Table 6. Airfield Planning Checklist
Planning Factors
Mission purpose.
Nature of air mission.
Intended airfield usage (e.g., mobility, fighter, bomber, remote piloted aircraft, rotary wing aircraft).
Airfield layout or site planning.
Projected number or nature of supported personnel at the airfield.
Tenant unit requirements.
Is a user liaison officer required?
Forces available for a mission.
Projected mission length.
Organizations or agencies involved.
Coalition forces.
Other government agencies.
Nongovernmental organizations.
Current airfield data.
Global Decision Support System information pull.
Is a survey or assessment required?
Threat Environment Force Protection
Threat to airfield or base.
Force protection.
Unique security needs.
Quick reaction force (QRF).
QRF communications plan.
Fire support.
Unexploded ordnance threat evaluation.

Table 6. Airfield Planning Checklist (Cont'd)
Medical
Essential care for airfield opening team.
Bioenvironmental.
Public health.
Environmental health site assessment.
Environmental
Emergency management.
Chemical, biological, radiological, nuclear, and high-yield explosives threat.
Local weather (predominant and climatology).
Weather observation, forecasting, and dissemination capabilities or requirements needed.
Host nation weather observing capabilities.
Communications
Requirements.
Communications security required.
Joint keys.
Classification level.
Compatibility.
Frequency requirements and deconfliction.
Host nation spectrum management.
Coalition joint spectrum management.
Navigation aids (NAVAIDS) or radar frequencies.
Intelligence
Enemy situation.
Friendly forces.
Local national threat.
Key terrain.
Surface-to-air missile, small arms fire, and indirect fires threat areas.
Lines of communication.
Enemy order of battle.
Host Nation Considerations
Host nation force size and composition (airfield security forces).
Cultural sensitivities or sensitive areas.
International agreements.
Aircraft positional diplomatic clearance requirements.
Arms control agreements.
Existing host nation agreements.
Airfield Infrastructure
The ability to support a planned mission.

Table 6. Airfield Planning Checklist (Cont'd)
Airfield data and surveys.
The availability of engineering materials.
The condition of utilities on the airfield.
Air Traffic Control (ATC) or deployable air traffic control and landing system available.
Lighting, NAVAID, and marking condition.
Arresting systems.
Environmental baseline survey.
Contracting or financial management.
Airspace
Airspace control plan.
Airflow requirements.
Fires integration and deconfliction.
Air defense integration.
ATC
Visual flight rules or instrument flight rules services.
Radar or non-radar.
Terminal.
En route.
Approaches required.
Terminal instrument procedures review.
Flight inspection.
Personnel required.
Qualifications.
Liaisons.
Translators.
Duty-day considerations.
Airfield Support and Services
Material handling equipment available.
Air-ground equipment available.
Hazardous materials requirements.
Aircraft rescue and firefighting requirements (e.g., fire suppression or crash rescue services).
Aircraft armament.
Explosive ordnance disposal.
Airfield management.
Weather personnel and equipment.
Established equipment available.
Portable equipment required.

Table 6. Airfield Planning Checklist (Cont'd)
Manpower requirements for operations.
Safety.
Availability of supplies.
Local economy.
Military supply system.
Cargo staging.
Storage size and capacity.
Road network availability and capability.
Airfield Transition (See the Transfer of Authority checklist in Appendix D.)
Security transition.
Condition of facilities.
Environmental risk mitigation.
Explosive ordnance disposal.
Inventories.
Supplies and equipment transfer.
ATC or airspace plan.
Anticipated future use.
Department of State integration.
Tactical airspace transition.

Appendix B
AIRFIELD ASSESSMENT AND SURVEY CHECKLIST

1. Overview

a. A single standard for airfield assessment data does not exist. The Air Mobility Command (AMC) Form 174, *Airfield Survey*, is one product that can be used as an airfield assessment or survey. The form can be downloaded from http://static.e-publishing.af.mil/production/1/amc/form/amc174/amc174.pdf.

b. Additionally, the joint task force-port opening joint assessment team (JAT) assessment report format is in United States Transportation Command (USTRANSCOM) Instruction 10-27, Vol 2, Attachment 2, *Joint Task Force–Port Opening*. Table 7 is a sample of an assessment checklist.

2. Timeline for the Initial Assessment

a. Four Hours. When the JAT leader or commander arrives at the point of debarkation (POD) the "go/no-go" is provided by leadership, after the initial assessment, to determine:

(1) If the POD can handle the stated mission.

(2) If augmentation is required before operations can commence (i.e. additional security, runway repair, etc.).

(3) If additional time is needed before the decision can be made.

b. Twenty-four Hours. This is after JAT personnel arrive at the POD to submit a JAT report (including the POD, distribution network, and forward node assessment) to USTRANSCOM and the geographic combatant commander.

Table 7. Airfield Assessment Checklist

Airfield Layout Checklist
Airfield name.
Runway data and condition.
- Useable or unusable.
- Damaged.
- Unexploded ordnance (UXO) present.
- Drainage problem.
- Rutting.
- Length.
- Width.
- Surface.
- Weight-bearing capacity.
- Slope and gradient.
- Longitudinal and lateral transverse gradient.
Glide-slope.

Table 7. Airfield Assessment Checklist (Cont'd)
Runway markings.
- Centerline.
- Runway edge.
- Distance.
Lighting.
- Edge.
- Approach.
- Threshold.
Visual approach slope indicator and precision approach path indicator.
Shoulder width.
Overrun data.
- Length.
- Surface type.
- Condition.
- Slope.
Arresting system.
- Type.
- Location.
Obstruction.
Approach illusions.
- Visual terrain.
- Zero city lights.
Engine blast information.
Obstacles on airfield (height, location).
Graded area zone (width, slope, obstacles).
Elevation.
Clear zone (obstacles, glide slope).
Approach zone (obstacles, clearance slope).
Hazards to flight.
Capability to support airlift operations.
- Maximum (aircraft) on ground (MOG) by type of aircraft.
Air Traffic Assessment Checklist
Field elevation.
Terminal area airspace (Airspace class and dimensions).
Traffic patterns.
Altitudes.
Type.
Prevailing wind.
Departure procedures.
- Radar handoff (Call sign, fix, altitude, frequency, location).
- Non-radar handoff (Call sign, fix, altitude, frequency, location).
- Heading.
Reporting points, visual flight rules, or instrument flight rules.

Table 7. Airfield Assessment Checklist (Cont'd)
- Location.
- Altitude.
- Pattern.
- Minimum safe altitude.
Missed approach instructions.
Jettison, bailout, and fuel dump areas.
- Location.
- Altitude.
Terminal approach procedures.
Notice to airmen .
Alternate airfields.
Navigational aids.
- Location.
- Type.
- Identifier.
- Frequency.
Obstacles in class D airspace or tower controlled airspace.
Arrival procedures.
Taxiway Assessment Checklist
Taxiway status.
- Unusable.
- Damaged.
- Checked for UXO.
Width.
Surface type.
Weight-bearing capability.
Markings.
Lighting.
Runway hold lights.
Shoulders stabilized.
Obstructions.
Serves as an emergency landing zone (LZ).
Environmental considerations.
Aircraft (fixed- or rotary-wing) movement on the ground.
- Identify any area not accessible to aircraft.
- Identify any specific taxi routes for aircraft.
Helipad Assessment Checklist
Dimensions.
Surface type.
LZ locations.
Forward arming and refueling point locations.
Existing approach plan.
Existing departure plan.

Table 7. Airfield Assessment Checklist (Cont'd)
Existing emergency egress plan.
Hazards to flight.
Environmental considerations.
Parking Assessment Checklist
MOG.
Designation.
Dimensions.
Surface type.
Weight-bearing capacity.
Tie-down rings.
Ground points.
Lighting.
Obstructions.
Special parking spots.
- Hot pads.
- Explosive and hazardous materials (HAZMAT) storage.
- Engine run clearance area.
- Hot refuel.
- Arm/de-arm.
Slope of ramp.
- Breakaway.
- Taxi power requirements.
Taxiway area for parking.
Factors that may affect aircraft operations.
Environmental considerations.
Lighting Assessment Checklist
Significant local lighting.
Surrounding area lighting.
Location of airport lighting controls.
Point of contact for turning lights on or off (phone number).
Pavement Analysis Assessment Checklist
Pavement type.
Pavement condition index.
Soil structure.
Load classification number.
Aircraft classification number.
Pavement classification number.
Airfield Support Assessment Checklist
Control tower facility.
- Operational.
- Unrestricted vision of all approaches, departures, runways, and taxiways.
- Electrical power available.
- Radio blind spots.

Table 7. Airfield Assessment Checklist (Cont'd)
Airfield management operations.
- Facilities.
- Bird aircraft strike hazard level history (BASH).
- BASH or bird avoidance model program.
- Bird hazard reporting signals or system.
- Braking action reporting capability.
- Airfield photos and maps.
Operations facilities.
- Room or building available.
- Space available for operations tents.
- Sanitation accommodations.
- Trash disposal.
Portable airfield lighting and marking.
- Airfield marking pattern 1, 2, or 3.
Weather.
- Equipment.
- Observation capability.
- Forecast capability.
- Conditions reporting capability.
Airfield communications.
- Ultrahigh frequency.
- Very-high frequency.
- High frequency.
- Frequency modulation.
- Satellite communications.
- Internet capability.
Telephones.
- Commercial.
- Defense Switched Network.
- Friendly forces communication list.
Manhole or cable ducting system.
Aircraft rescue and firefighting.
- Equipment.
- Capacity.
- Water and foam rates.
Environmental considerations.
Transportation and Logistics Assessment Checklist
Aerial port facility requirements.
- Covered spaces available.
- Dimensions.
- Outside storage space available.
- Location.
- Dimensions.

Table 7. Airfield Assessment Checklist (Cont'd)
- Fencing.
- Lights.
- Hazardous cargo buildup areas.
- Passenger service area.
Aircraft support.
- Fire bottles.
- Power units.
- Light carts.
- Aerospace ground equipment.
- Maintenance stands.
- Maintenance hangars available.
Revetments available.
Munitions storage area.
Electrical power (volt and hertz) availability with hangar space.
Fuels.
- Jet fuel storage capabilities.
- Jet fuel dispensing capabilities.
- Refueling vehicles.
- Supported aircraft type.
- Liquid oxygen.
- Gaseous oxygen.
- Gaseous nitrogen.
- Ground fuel storage and distribution.
- Determine Resupply nodes.
- Oil and lubricants.
Transportation.
- Material handling equipment and vehicles available.
- Host nation (HN) support.
- Contract transportation assets.
- Assets available from support agencies.
- Location of the movement control center.
- Availability of local road maps.
- Identified arrival/departure airfield control group procedures.
- Identified seaport of debarkation.
- Location.
- Route.
- Procedures.
- Environmental considerations.
Base Support Assessment Checklist
Base facilities.
- Billeting area.
- Messing facilities.

Table 7. Airfield Assessment Checklist (Cont'd)
- Open and covered storage areas for base operations support materials and, if necessary, for vehicles and equipment.
Hospitals and medical support.
- Location of medical facilities.
- Capabilities.
- Location of area support medical company.
- Emergency evacuation procedures.
- Location of civilian medical facilities.
- Capabilities.
- Availability of emergency medical transportation.
- Hours medical service is available.
- Mortuary collection point.
Water.
- Suitability of local water sources.
- Sources of the local drinking water.
- Location of potable water points.
- Location of non-potable water points.
Bulk fuels.
- Location of the nearest seaport capable of handling bulk fuel delivery by ocean tanker.
- Delivery means to the airfield.
Firefighting support.
- Manpower.
- Facilities.
- Equipment.
- Location and response time.
- HN firefighting support.
- Procedures to request firefighting.
- Can support what MOG quantity? For what time duration?
- Fire/rescue point of contact.
Field Sanitation.
- Field latrines.
- Locations.
- Servicing.
- Status.
- Service agreements in place.
- Theater-specific health concerns.
- Preventative measures identified.
- Trash collection procedures.
- Burn procedures.
Power generation.
- Status of commercial power.
- Augmentation of commercial power to tactical power.

Table 7. Airfield Assessment Checklist (Cont'd)
- Structure of power limitations.
- Environmental considerations.
Security and Disaster Preparation Assessment Checklist
Note: This portion of the checklist is classified once security information is filled in.
Airfield security force.
- Nationality.
- Strength.
- Point of contact information.
Configuration of security personnel.
- Communication procedures.
- Inner and outer perimeters.
Airfield physical defenses.
- Entry control points.
- Observation points.
- Remote sensors or cameras.
Man-portable air defense system threat.
- Vulnerabilities.
- Mitigation measures.
Small arms threat.
- Vulnerabilities.
- Mitigation measures.
Mortar threats.
- Vulnerabilities.
- Mitigation measures.
- Rockets and rocket propelled grenades.
Threats in the airfield boundary.
Dispersal plan.
Danger spaces around the airfield.
The distance from the airfield perimeter to aircraft.
Perimeter fencing or barriers in place.
Types of security responses.
Chemical, biological, radiological, nuclear, and high-yield explosives considerations.
Weather and Geography
Types of weather conditions encountered in the area and time of year for these occurrences.
Prevailing winds per calendar year quarter.
Maximum and minimum average precipitation per month.
Frequency, duration, and density of fog and dust.
Effect of weather on terrain (e.g., flash flooding, mudslides, avalanches, etc.).
Effects of weather on node logistics operations.
Seasonal climatic conditions that would inhibit node operations (more than 24 hours).
Available Cargo Handling Equipment
Quantity, location, and type of cargo handling equipment .

Table 7. Airfield Assessment Checklist (Cont'd)
Characteristics of equipment (such as power, lift capacity, dimensions, make, model, condition, age, compatibility with other equipment, certification and characteristics for handling explosive and hazardous cargo).
Joint Task Force-Port Opening (JTF-PO) Forward Node (FN) Assessment Checklist
Status of threat and force protection on the main supply route out to 10 kilometers.
Convoy security and support.
Road and bridge support capability.
Site selection of FN.
Physical security of the site.
Size and composition.
Quantity and types of vehicles.
Facilities available at the forward distribution node.
Required communications infrastructure and in-transit visibility required and available.
JTF-PO Land Transportation Forward Node
Map sheet number.
Grid coordinates or latitude/longitude.
Node capacity.
Culturally-sensitive site in or near the node.
Names, titles and addresses of the node or terminal authorities or agents.
Nearest United States' consulate.
Current tariffs.
Command and control key contacts, including phone numbers.
Terrain description within 10 kilometers of the aerial port of debarkation.
Location of nearest towns, or other airports, seaports, and military installations.
Terminal data.
Type of node terminal: truck, rail, inland waterway or combination.
Length and weight-bearing capacity of roads and parking ramps.
Description of terrain in the node area.
JTF-PO Node Terminal Workforce
Number and size of HN contractor or nongovernmental organization support groups.
Work hours available.
Availability of HN labor.
Special handling certifications.
Security requirements.
JTF-PO Cargo Throughput Facilities at Designated Nodes
Number and characteristics of facilities.
Types.
Capacity.
Flooring, walls, roofing.
State of repair.
Special facilities.
Map of node location (attach if available).

Table 7. Airfield Assessment Checklist (Cont'd)
HAZMAT and hazardous waste facilities.
Lines of communications available.
Primary and secondary roads.
Types of roads (concrete, asphalt, dirt).
Capacity of the road network.
Conditions of roads.
Bridges constructed along the main supply route.
Available bridge construction materials along the main supply route.
Width and weight allowances of bridges on the main supply route.
Overpass and tunnels, width and height allowances.
Major cities or towns along the main supply route.
Communications limitations along the main supply route.
Note: Complete an individual section for multiple runways or forward nodes. For example, if there are two assessed nodes, complete a separate FN assessment checklist for both.

Appendix C
AIRFIELD OPENING CHECKLIST

1. Handoff from Seizure Forces

a. Planning. Transfer of senior airfield authority (SAA) from seizure forces to follow-on forces is a deliberate planning event. The transfer of authority, despite its operational connotations, is a tactical event that requires tactical considerations. See table 8 for an initial handoff checklist.

b. Planning Factors. Key planning factors include:

(1) Determine who the follow-on forces should speak to during the transfer of authority event.

(2) The communications between seizure forces and follow-on forces.

(3) Where the transfer of authority will take place on the field.

(4) Go/no-go contracts between the seizure force and the follow-on forces.

(5) Consider tactical movement on the field.

(6) Procedures for follow-on forces to request aid or a quick reaction force (QRF) from seizure forces.

(7) Sustaining follow-on forces until their own equipment and sustainment arrive.

(8) Establishing the command relationship between seizure forces and follow-on forces.

(9) Determining reactions to attack and indirect fire.

c. General Procedures. Discuss and finalize all aspects of the initial handoff checklist (table 8). When the transfer is to Air Force units, the air mobility liaison officer (AMLO) is critical for initiating and facilitating these planning events. Joint training in this process will help seizure and hand-off forces build a common understanding of each force's needs, capabilities, limitations, and lexicons. If seizure forces conduct a rehearsal, the follow-on force's action officers should participate.

d. Initial Contacts. Establish contact with the land force commander. If following an Army brigade combat team (BCT), the assessment team commander or Service-specific contingency response force (CRF) commander will want to make contact with the land force, unit commander occupying the airfield for a situation report (SITREP). This person may be the BCT commander, brigade support battalion commander, brigade engineer battalion commander, or another tasked unit's commander.

e. Initial SITREP. The information in table 8 must be complete prior to the formal battlefield hand over between the BCT commander (if possible) or a designated representative and the CRF commander. Priorities 1, 2, and 3 list tasks that need attention before seizure forces complete a hand off.

Note: The checklist in table 8 guides assessment of, but does not require adherence to. Be mindful of battlefield conditions to determine the specific applicability of each

checklist item. If the seizure force is still engaged in the fight, expect limited hand-over information. Expect the commander of the seizure force unit occupying the airfield to provide the initial SITREP. Prioritize discussion topics to aid with brevity, depending on battlefield conditions.

Table 8. Initial Handoff Checklist
Tasks and Considerations
Priority 1
Situation report. Consider the threat environment, enemy location, airfield or landing zone condition, or sustainment requirements. Is additional support needed to complete the mission?
Location of Friendly Forces. Where are the fields of fire?
Status of the runway or landing zone. Has the airfield been damaged by the operation?
Base defense operations center or joint operations center. Establish one if none exists.
Sensors. What sensors are available and what is required after handoff?
Configuration and location of seizure force airfield security forces. Where are the fields of fire?
Force integration. How can incoming forces best integrate with forces already in place?
Signal operating instructions. Ask for the current signal operating instructions, if not part of the seizure force. Only if breaching operations security would they require a change. - Challenge and use passwords. - Implement near and far recognition. - Use a running password. - Use a number combination.
Location of casualty collection or evacuation point.

Table 8. Initial Handoff Checklist (Cont'd)
Tasks and Considerations
Ground communication status. Conduct a communications check on frequency modulation nets, as required, if it is not part of the seizure force's procedures. (Complete this prior to operation commencement, if part of the seizure force's procedures.)
Team notification of threats to the airfield.
Deconflict command and control of airspace over the airfield or landing zone.
Where, and what are the capabilities of, artillery and mortars in the airfield environment?
What are their standard operating procedures for firing indirect fires?
What is the command net frequency? - How do airfield opening forces deconflict fires with inbound and outbound aircraft? - Who is the fire direction officer? - Who is the fire support officer?
Priority 2
Determine rules of engagement changes (if any).
Determine the seizure force's logistical support requirements.
Establish traffic control points, as needed.
Create a vehicle-parking plan (airfield).
Determine if environmental concerns exist. If they do, determine their locations.
Priority 3
Type and number of stay-behind forces. - Commander. - Noncommissioned officer in charge. - Follow-on forces.
Allotted time on the objective.
The command relationship.
Additional points of contact. - Force protection. - Civil engineering. - Explosive ordnance disposal. - Communications. - Airfield operations.

Note: After completing the coordination, notify the BCT commander, or the designated representative, of CRF or assessment team operations.

f. CRF posts airfield assessment actions and guidelines for the battle handover.

(1) Establish a CRF tactical operations center.

(2) Verify communications connectivity between the CRF tactical operations center and seizure force operations center.

(3) Ensure repairs are complete.

(4) Determine seizure force augmentee requirements.

(a) Is an additional security detachment required for augmentation?

(b) Are additional seizure force augmentees required to service or onload/offload organic Service aircraft?

(5) The CRF assumes airfield management and SAA authority over the airfield.

(6) Conduct a battle handover of airfield internal security from the seizure force to the CRF security forces.

(7) Establish air traffic control (ATC).

2. Airfield Operations and Support

a. Establish an operations center.

(1) Designate initial work centers, physical areas of responsibility, and priority of effort.

(2) Set up the battle rhythm (e.g., work schedules, meeting times, etc.).

(3) Set up and check communications with local and outside agencies.

(4) Manage personnel accountability and equipment control procedures, as required.

(5) Update personnel on current force protection conditions, weather conditions (e.g., watches, warnings, and advisories), health threats, and protection measures.

(6) Coordinate and build a personnel bed-down plan (e.g., billeting, messing, medical, sanitation, laundry, latrines, etc.).

b. Establish command and control procedures and aircraft flow control with higher headquarters.

(1) Coordinate with the air operations center (AOC) and other scheduling agencies to manage aircraft and cargo flow.

(2) Synchronize mission requirements with airfield support and aircraft schedules.

c. Manage the airfield.

(1) Inspect runway, taxiway, and ramp areas daily.

(2) Synchronize daily airfield operations, including construction and repairs.

(3) Coordinate a parking plan.

(4) Process notices to airmen.

(5) Establish a comprehensive airfield driving program to train vehicle operators to operate safely in the airfield environment.

(6) Implement wildlife control measures to prevent bird and animal strikes.

(7) Initiate runway condition reading capabilities and equipment.

d. Plan for aircraft rescue and firefighting (ARFF) needs.

(1) Ensure the ARFF capability is sufficient for the intended aircraft mission. Initiate waivers thru the joint force commander's staff if the capability is below minimum standards.

(2) Establish mishap and incident response plans.

e. Plan for chemical, biological, radiological, nuclear, and high-yield explosive (CBRNE) considerations.

f. Determine cargo and passenger handling requirements.

(1) Establish procedures to handle and hold hazardous materials, munitions, outsized or oversized cargo, rolling stock, and pallets.

(2) Establish passenger-processing procedures (i.e., security screening, baggage, manifest, scheduling, host nation (HN) and United States (US) customs, etc.).

(3) Establish facilities and procedures to prepare and inspect cargo for onward movement.

(4) Determine special handling requirements for casualties, noncombatant evacuation operation passengers, non-US passengers, or enemy prisoners of war, for example.

g. Develop aircraft maintenance support. Coordinate space and resources to support mission requirements.

h. Establish ATC support.

(1) Coordinate with appropriate ATC agencies to establish and control airspace.

(2) Coordinate with tactical control units, as required (e.g., a special tactics team).

(3) Integrate procedures with air defense and artillery elements, such as a fire direction center and base defense plan.

(4) If not given full control of airspace, provide air traffic liaison services to aid the HN in handling the increased airbase workload.

i. Provide civil engineer and engineer support.

(1) Inspect runways and supporting infrastructure to certify airfield capabilities.

(2) Perform regular maintenance to the airfield, including lighting and marking.

(3) If the airfield is damaged, conduct repairs or facilitate contracted repair services.

(4) Be prepared to conduct airfield damage repair operations.

(5) Remove snow and ice.

(6) Implement required CBRNE plans.

j. Provide utilities support.

(1) Power production and distribution.

(2) Environmental controls.

k. Manage fuels, petroleum, oil, and lubricants.

(1) Determine the quantity and type of fuel required and resupply and sampling procedures.

(2) Ensure a sufficient area and clear zones exist for refueling operations.

(3) Develop a plan to minimize the environmental impact of fuel spills, leaks, and storage failures.

l. Enable communication.

(1) Prioritize and establish lines of communication with all airfield entities, in accordance with mission needs.

(2) Publish communication information (e.g., phone, frequencies, email, etc.) with ATC, higher headquarters, AOC, air mobility division, HN, aircraft, etc.

m. Provide contracting and financial management.

(1) Determine the HN's availability of goods and services for supply and requirement augmentation, particularly, critical-mission support supplies such as food, water, and fuel.

(2) Establish contractual agreements, as required.

(3) Identify procurement items through base supply and HN organizations, and acquire construction materials through contracting and HN resources.

(4) Verify availability of funds (through signature certification) and accurate payments for supplies and services.

n. Plan for specific ordnance and armament considerations.

(1) Ensure ordnance storage and loading areas are away from potential hazards, including radiation or high-frequency communication.

(2) Ensure the location supports ammunition storage and up-load.

(3) Ensure there is adequate ammunition storage and segregation by compatibility.

(4) Establish a safe distance based on net explosive weight.

o. Provide for explosive ordnance disposal (EOD) operations.

(1) Ensure the EOD capability is sufficient for the intended aircraft mission and coverage of ordnance disposal.

(2) Verify unexploded explosive ordnance (UXO) clearance in the area.

(3) Ensure the appropriate reaction forces are available to support aircraft armament.

(4) Plan UXO reconnaissance, assessment, render safe, and removal.

(5) Ensure there is a counter-improvised explosive device capability.

p. Establish safety and risk management.

(1) Ensure personnel and plans are in place to maintain safe flight and ground operations and safe weapons and ammunitions handling.

(2) Develop and implement a foreign object damage mitigation plan based on aircraft type and surface conditions.

(3) Ensure mishap response and investigation teams are identified.

q. Establish weather support for the airfield.

(1) Establish personnel and resource protection requirements, thresholds, and dissemination procedures, including designated airfield shelters and evacuation plans.

(2) Provide airfield and mission weather services, including weather observations, weather warnings or advisories, and mission weather products supporting operations originating or terminating at the airfield.

r. Provide security.

(1) Existing airfield opening forces can have some degree of organic security for airfield access control and limited self-defense. However, force protection for the expanded base area, suppression of enemy air defense, and patrols for indirect fire standoff depend on additional forces.

(2) Coordinate with the base defense operations center, seizure force, or HN to establish entry control points, guard towers, or defensive fighting positions, in and around the airfield environment.

(3) Determine requirements for aircraft and ramp security to prevent unauthorized vehicle or pedestrian access to the flightline. Inadvertent or uncontrolled entry onto the runway or other controlled movement areas is a serious concern, and is one of the leading hazards to flight safety.

(4) Integrate airfield defense requirements into an overall base defense plan. Incorporate intelligence support to capture and disseminate information affecting air operations.

(5) Establish procedures for ceasing, altering, and resuming aircraft operations during and after an attack.

(6) Create and disseminate an anti-hijacking, bomb threat, and crisis action plan.

(7) Ensure rules of engagement are clear and understood.

s. Coordinate HN considerations.

(1) Establish liaison capability with the local embassy and diplomats, if applicable.

(2) Coordinate with nongovernmental organizations to assist in humanitarian relief and HN authorities.

(3) Understand local airfield, flight hour, and noise abatement restrictions.

(4) Determine command relationships with HN forces.

(5) Seek HN overflight and access agreements that suit the foreseeable period of operations.

t. Consider unmanned aircraft systems.

(1) Due the large variety of unmanned aircraft systems employed, consult a systems expert for airfield and airspace planning.

(2) Consider low-altitude air defense and counter-UAS. Systems may need to be emplaced to counter enemy air threats, including UAS, rockets, and mortars.

Table 9 provides a checklist to use for conducting airfield operations. Table 10 provides a checklist to use for conducting airbase support activities.

Table 9. Airfield Operations Checklist
Tasks and Considerations
Manage the airfield. (1) Inspect runway, taxiway, and ramp areas daily. (2) Synchronize daily airfield operations including construction and repairs. (3) Coordinate a parking plan. (4) Process notices to airmen. (5) Establish a comprehensive airfield driving program to train vehicle operators to operate safely in the airfield environment. (6) Implement wildlife control measures to prevent bird and animal strikes. (7) Install runway condition-reading capabilities and equipment. (8) Inspect runways and supporting infrastructure to certify airfield capabilities. (9) Perform regular maintenance to the airfield, including lighting and marking. (10) If an airfield is damaged, repair it or facilitate contracted repair services. (11) Be prepared to conduct airfield damage repair operations. (12) Conduct snow and ice removal. (13) Implement required chemical, biological, radiological, nuclear, and high-yield explosives response plans.
Plan for aircraft rescue and firefighting needs. (See Air Force pamphlet 32-2004, *Aircraft Fire Protection for Exercises and Contingency Response Operations* for more information.) (1) Ensure the aircraft rescue and firefighting capabilities are sufficient for the intended mission. Initiate waivers through the joint force commander's staff if the capability is below minimum standards. (2) Establish mishap and incident response plans.

Table 9. Airfield Operations Checklist (Cont'd)
Tasks and Considerations
Establish safety and risk management. (1) Ensure personnel and plans are in place to ensure safe flight and ground operations, and safe weapons and ammunitions handling. (2) Develop and implement a foreign object damage mitigation plan based on aircraft type and surface conditions. (3) Ensure mishap response and investigation teams are available or identified.
Enable communication. (1) Prioritize and establish lines of communication with all airfield entities, in accordance with mission needs. (2) Publish communication information (phone, frequencies, email, etc.) with air traffic control, higher headquarters, air operations center, air mobility division, host nation, aircraft, etc.
Coordinate host nation considerations. (1) Establish liaison with existing host nation operations entities. (2) Understand local airfield, flight hour, and noise abatement restrictions. (3) Seek host nation overflight and access agreements that suit the foreseeable period of operations.
Manage aviation fuels, petroleum, oil, and lubricants. (1) Determine the quantity and type of fuel required and resupply and sampling procedures. (2) Ensure sufficient area and clear zones exist for refueling operations. (3) Develop a plan to minimize environmental impact of fuel spills, leaks, and storage failures.

Table 10. Airbase Support Checklist
Tasks and Considerations
Establish an operations center. (1) Set up and check communications with local and outside agencies. (2) Designate initial work centers, physical areas of responsibility, and priority of effort. (3) Set up the battle rhythm (i.e., work schedules, meeting times, etc.). (4) Manage personnel accountability and equipment control procedures, as required. (5) Update personnel on current force protection conditions, weather conditions (e.g., watches, warnings, and advisories), health threats, and protection measures. (6) Coordinate and build a personnel bed-down plan (i.e., billeting, messing, medical, sanitation, laundry, and latrines).
Establish command and control procedures and aircraft flow control with higher headquarters. (1) Coordinate with the air operations center and other scheduling agencies to manage aircraft and cargo flow. (2) Synchronize mission requirements with airfield support and aircraft schedules.
Plan for chemical, biological, radiological, nuclear, and high-yield explosive (CBRNE) considerations.
Determine cargo and passenger handling requirements. (1) Coordinate with airfield management agencies to designate and mark off cargo marshalling and processing yards. (2) Arrival/Departure Airfield Control Group. Designate a unit that processes cargo and passengers. (3) Establish procedures to handle and hold hazardous materials, munitions, outsized or oversized cargo, rolling stock, and pallets. (4) Coordinate with airfield management agencies to designate and mark off passenger processing, anti-hijacking, and holding areas. (5) Establish passenger-processing procedures (i.e., security screening, baggage, manifest, scheduling, and host nation (HN) and United States (US) customs services). (6) Establish facilities and procedures to prepare and inspect cargo for onward movement. (7) Determine special handling requirements, as required (e.g., casualties, noncombatant evacuation operation passengers, non-US passengers, or enemy prisoners of war). (8) Medical evacuation (MEDEVAC)/casualty evacuation (CASEVAC). Planners should consider ramp parking for MEDEVAC/CASEVAC. Designate a work area for MEDEVAC/CASEVAC personnel. (9) Determine responses to CBRNE events.

Table 10. Airbase Support Checklist (Cont'd)
Develop aircraft maintenance support. Coordinate space and resources to support mission requirements.
Utilities support. (1) Power production and distribution. (2) Environmental controls.
Provide contracting and financial management. (1) Determine the HN's availability of goods and services for supply and requirement augmentation; particularly critical are mission-support supplies such as food, water, and fuel. (2) Establish contractual agreements, as required. (3) Identify procurement items through base supply and HN organizations and acquire construction materials through contracting and HN resources. (4) Verify the availability of funds through signature certification and accurate payments for supplies and services.
Plan for specific ordnance and armament considerations. An ammunition or ordnance expert should be included on all staffs for missions that include arming or de-arming aircraft. This function should coordinate with the airfield manager on an arm/de-arm or engine running on-load ramp and hot pit. (1) Ensure ordnance storage and loading areas are away from potential hazards, including radiation or high-frequency communication. (2) Ensure the location supports ammunition build up and up-load. (3) Ensure there is adequate storage and segregation for ammunition, including compatibility. (4) Ensure proper distance is established based on net explosive weight.
Provide for explosive ordnance disposal (EOD) operations. EOD technicians render safe or neutralize unexploded explosive ordnance (UXO), mines or explosive hazards on the airfield and base operating areas. In addition, EOD forces support sortie generation by responding to in-flight and ground emergencies or crash situations. (1) Ensure the EOD capability is sufficient for the intended aircraft mission and coverage of ordnance disposal. (2) Verify UXO clearance in the area. (3) Ensure the appropriate reaction forces are available to support aircraft armament. (4) Plan UXO reconnaissance, assessment, rendering safe, and removal. (5) Ensure there is a counter-improvised explosive device capability.

Table 10. Airbase Support Checklist (Cont'd)
Establish weather support for the airfield. (1) Establish personnel and resource protection requirements, thresholds, and dissemination procedures, including designated airfield shelters and evacuation plans. (2) Provide airfield and mission weather services, including weather observations, weather warnings or advisories, and mission weather products supporting operations originating or terminating at the airfield.
Provide security. (1) Existing airfield opening forces can have some degree of organic security for airfield access control and limited self-defense. However, force protection for the expanded base area, suppression of enemy air defense, and patrols for indirect fire standoff depend on additional forces. (2) Coordinate with the base defense operations center, seizure force, or HN to establish entry control points, guard towers, defensive fighting positions, etc., in and around the airfield environment. (3) Determine requirements for aircraft and ramp security to prevent unauthorized vehicle or pedestrian access to the flightline, runway, or controlled movement area. Inadvertent or uncontrolled entry onto the runway, or other controlled movement area, is a serious concern and is one of the leading hazards to flight safety. (4) Integrate airfield defense requirements into an overall base defense plan. Incorporate intelligence support to capture and disseminate information affecting air operations. (5) Establish procedures for ceasing, altering, and resuming aircraft operations during and after an attack. (6) Create and disseminate an anti-hijacking, bomb threat, and crisis action plan. (7) Ensure rules of engagement are clear and understood.
Coordinate HN considerations. (1) Establish liaison capability with the local embassy and diplomats, if applicable. (2) Coordinate with nongovernmental organizations to assist in humanitarian relief and HN authorities. (3) Determine command relationships with HN forces.
Consider unmanned aircraft systems as they relate to airfield and airspace planning.
Consider air defense and counter-unmanned aircraft systems.
Consider friendly surface-to-surface fires requirements.

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Appendix D
AIR TRAFFIC CONTROL and AIRFIELD TRANSITION CHECKLIST

The checklist in table 11 is a guide for airfield operation processes and procedures during transfer of authority between transitioning forces (e.g., seize to open, open to establish, establish to operate, operate to sustain).

Table 11. Sample Airfield Transition Checklist
Available Items
Completed Air Force (AF) Form 3822, *Landing Zone Survey*.
Completed AF Form 3823, *Drop Zone Survey*.
Completed AF Form 4303, *Helicopter Landing Zone Survey*.
Completed Air Mobility Command Form 174, *Airfield Survey*.
General Airfield Information
International Civil Aviation Organization designation.
Coordinates.
Field elevation.
Airfield imagery or diagrams.
Runways: - Designations. - Lengths and widths. - Markings and lighting. - Pavement classification number and weight-bearing capacities. - Obstructions or obstacles.
Taxiways: - Designations. - Lengths and widths. - Markings and lighting. - Pavement classification number and weight-bearing capacities. - Obstructions or obstacles.
Aprons and parking areas: - Designations. - Dimensions. - Markings and lighting. - Pavement classification number and weight-bearing capacities. - Obstructions or obstacles.
Approach lighting systems.

Table 11. Sample Airfield Transition Checklist (Cont'd)
Available navigational aids (NAVAIDs): - Location. - Type. - Identifier. - Frequency.
Closed or unusable sections of an airfield.
Arresting gear.
Hazardous cargo parking.
Ground Vehicle and Aircraft Movement
Aircraft parking plan and spot restrictions.
Controlled movement area locations and procedures.
NAVAID or precision approach critical areas.
Vehicular call signs.
Emergency vehicle operations.
Aircraft taxi routes and restrictions.
Aircraft towing requirements.
Airfield maintenance (e.g., mowing or sweeping).
Transient alert services.
Hot pit refueling areas.
Engine run and test locations.
Air Traffic Control
Terminal area airspace: - Classification. - Dimensions. - Special use airspace. - Minimum safe altitude.
Frequencies: - Tower. - Ground. - Approach. - Center. - Alternate communications (e.g., a cell phone or back up radios).
Visual flight rules (VFR) procedures: - Traffic pattern types. - Traffic pattern altitudes. - VFR reporting points.

Table 11. Sample Airfield Transition Checklist (Cont'd)
Instrument flight rules (IFR) procedures: - Arrival procedures or available approaches. - Departure procedures. - IFR reporting points. - Local climb-out procedures. - Missed approach procedures. - Radar hand-off procedures.
Adjacent air traffic control facilities.
Local airspace authority.
Local aircraft priority.
Breakout procedures.
Opposite direction procedures.
Noise abatement.
Special procedures (e.g., for rotary-wing aircraft or a distinguished visitor).
Weather reporting procedures.
Tower visibility reference points.
Automatic terminal information service procedures.
A facility operating instruction.
Host nation (HN) memorandum of agreement.
Facility staffing requirements.
Airfield Management
Criteria violations and waiver status.
Airfield check and inspection schedule or information: - Procedures for opening or closing the airfield. - Runway surface condition and runway condition reading procedures.
Procedures for suspending runway operations.
Notice to airmen procedures.
Flight plan information.
Prior permission required procedures.
Flight information publication availability.
Weight-bearing capacity waiver procedures.
Bird aircraft strike hazard (BASH) information: - BASH measures. - Bird watch conditions guidelines. - Local wildlife information.
Airfield driver's license procedures and penalties.
Airfield construction.
Snow removal operations.
Anti-ice or deice operations.

Table 11. Sample Airfield Transition Checklist (Cont'd)
Facility operating instructions.
HN memorandum of agreement.
Facility staffing requirements.
Weather
Equipment available.
Observation capability.
Forecasting capability.
Condition reporting capability.
Severe weather procedures.
Emergency Procedures
Aircraft rescue and firefighting information: -Vehicles available. - Personnel and shifts. - Response time. - Contact method and frequency.
Primary and secondary crash net procedures.
In-flight emergency and ground emergency response procedures.
Arresting gear procedures.
Hot brake procedures.
Jettison and bailout procedures.
Fuel dumping procedures.
Alternate facilities for evacuation.
Emergency locator transmitter procedures.
Anti-hijacking procedures.
Areas of Concern
Force protection: - Man-portable air defense system threat. - Tactical arrival procedures. - Approach and departure corridor security.
HN limiting factors or concerns.
Points of Contact
HN airfield manager.
HN chief controller or ATC representative.
Flying unit points of contact.
Combatant command functional contacts.

Appendix E
UNITED STATES ARMY CAPABILITIES

1. Overview

Theater airfield operations groups (TAOGs) and airfield operations battalions (AOBs) were designed and implemented as a result of lessons learned identifying the need for an airfield management capability to execute theater-level airfield missions. TAOGs provide the joint force commander (JFC) with the expertise to execute the theater airfield mission and coordinate all support requirements not organic to the AOB. The TAOG may be deployed in total, or task organized by teams, to provide the JFC the coordination and command and control (C2) capability to operate a single airfield or conduct operations in multiple locations within the theater.

2. TAOGs

a. There are two TAOG organizations within the Army; one active duty group and one Army National Guard group. The active TAOG has two AOBs based in the continental United States (CONUS) and one AOB located outside the CONUS. The reserve component TAOG provides oversight for four CONUS-based National Guard AOBs in Tennessee, Mississippi, North Carolina, and Florida.

b. The TAOG's mission is to plan, integrate, and provide oversight of airfield management and air traffic service (ATS) operations within a theater of operation. The TAOG operates as the airfield management and ATS headquarters and interfaces with host nation (HN), coalition, and joint forces to enable Army aviation and joint force operations.

c. The TAOG executes theater airfield operations and synchronizes air traffic in a joint environment. It establishes theater airfields in support of reception, staging, onward movement, and integration requirements, seaport of debarkation, aerial port of debarkation (APOD) and joint operations. The TAOG coordinates and integrates terminal airspace use requirements with the airspace command and control element.

d. The TAOG is the standardization element for all Army airfields within a theater of operations. The TAOG coordinates and schedules flight checks, reviews and processes terminal instrument procedures (TERPS) procedures, and provides quality assurance of controller, air traffic control (ATC), maintenance, and flight operations training and certification programs. It also supports the Army Service component commander (ASCC) on Title 10, United States Code, ATS issues; liaison responsibilities with HN airspace authority; and other United States and combined Services and agencies.

e. The TAOG has the following capabilities:

(1) Developing and validating theater ATS force requirements.

(2) Interfacing with appropriate theater staff elements for planning and executing airfield and ATS mission sets.

(3) Reviewing and processing TERPS for terminal areas.

(4) Providing personnel for a survey or reconnaissance party team, ensuring air traffic procedures, ATS equipment emplacement criteria, and TERPS are considered and addressed during site surveys.

(5) Providing expertise to the ASCC on Title 10, HN, and ATS issues, including ATC and ATS systems support contractors.

(6) Coordinating and synchronizing ATS field service representatives.

(7) Synchronizing theater ATS maintenance efforts.

(8) Identifying ATS equipment staging or reset requirements.

(9) Executing ATS liaison responsibilities, as required by ASCC, with HN airspace authority and a combined or joint air operations center.

3. AOB

a. The AOB provides airfield management and ATS at a designated airfield, within a theater of operations. The AOB establishes an airspace information center for airspace management and interfaces with the theater airspace system. It is comprised of a headquarters company, airfield management element, and an ATC company. See figure 4 for a diagram of the AOB organization.

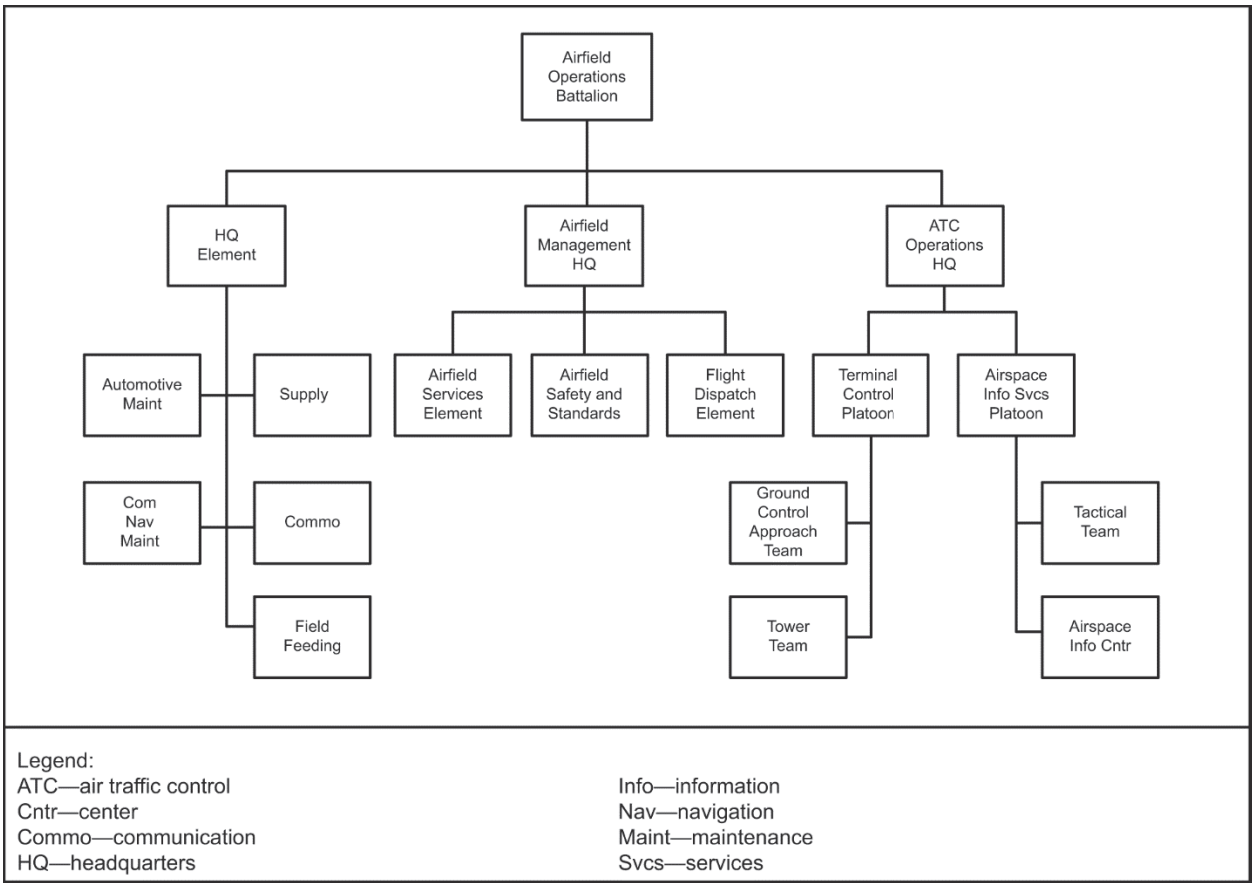


Figure 4. AOB Organization

b. The battalion consists of an ATC operations element, an airfield services element, a safety/standardization section, and a communication/navigation maintenance section. The AOB organizational design does not include the associated equipment and personnel needed to provide a full range of airfield activities in support of aviation operations. With augmentation, the AOB can provide mission command to other airfield service support assets such as: aircraft crash rescue; hazardous material handling; cargo loading; weather services; a petroleum, oil, and lubricants section; and the base defense operations center (BDOC).

c. AOB has the following systems:

(1) A mobile ATC tower system.

(2) An air traffic navigation, integration, and coordination system which, is a radar approach control system that is International Civilian Aviation Organization (ICAO) or National Airspace System (NAS) compliant.

(3) A tactical airspace integration system that is Link 16 capable and provides flight following and command air picture.

(4) A tactical terminal control system that is a vehicle-mounted ATC system. It provides for visual flight rules (VFR) control in remote locations, such as landing zones (LZs), drop zones (DZs), pickup zones, or forward arming and refueling points (FARPs).

d. The AOB has the following capabilities:

(1) Conducting airfield safety inspections.

(2) Developing the local flying area rules and hazards map.

(3) Transmitting flight movement messages.

(4) Developing and coordinating the pre-accident plan.

(5) Coordinating local flying rules on theater airspace.

(6) Providing personnel for a survey or reconnaissance party team, ensuring air traffic procedures, ATS equipment emplacement criteria, and TERPS are considered and addressed during site surveys.

(7) Providing liaison with the airspace authority joint force air component commander or combined air operations center.

(8) Establishing an airfield crash system and provides flight dispatch services.

(9) Processing and disseminating the air tasking order and airspace control order and special instructions (SPINS) information.

(10) Processing airspace coordinating measure requests for terminal areas.

(11) Providing the airspace common operational picture.

(12) Establishing terminal ATS from the tower and ground control approach (GCA).

(13) Establishing airspace information centers.

(14) Interfacing with theater or corps C2 air on airspace, aviation procedures guide, or heliport procedures guide.

(15) Ensuring tactical aviation control teams (TACTs) in austere conditions or tactical environments are operational 15 minutes after arrival in an area of operations (AO).

e. With augmentation, the AOB can provide mission command to, or provide the following services.

(1) Aircraft fuel and refueling services.

(2) Hazardous material handling.

(3) Cargo up and down loading.

(4) Force protection, security, or quick reaction force.

(5) Weather.

4. ATS Company Organization

a. The tactical ATS company organization, within the general support aviation battalion of a combat aviation brigade (CAB), provides tactical ATS in support of Army aviation operations. An ATS company supports the CAB by providing terminal area and en route airspace information and control services. ATS companies provide services to support CABs throughout full-spectrum operations. ATS companies are composed of a control tower, GCA, an airspace information center, and two tactical aviation control teams. They also deploy as part of the CAB and are an integral part of the brigade's readiness.

b. The ATS company has the following systems.

(1) A mobile ATC tower system.

(2) An air traffic navigation, integration, and coordination system (an ICAO and NAS compliant radar approach control system).

(3) A tactical airspace integration system that is Link 16 capable and provides flight following and command air picture.

(4) Two tactical terminal control systems, that are vehicle mounted ATC systems. They provide for VFR control in remote locations such as LZs, DZs, pickup zones, or FARPs.

c. The ATS company is deployable within 96 hours of notification, and are equipped and capable of the following in any environment:

(1) Controlling tower operations upon 30 minutes of arrival in an AO. They become fully operational within 1 hour of arrival.

(2) Providing self-sustaining operations for 72 hours upon arrival in an AO.

(3) Ensuring TACTs in an austere or tactical environment are operational 15 minutes after arrival in an AO.

(4) Supporting aircraft recovery operations, including personnel recovery, medical evacuation (MEDEVAC), and assistance to aircraft in distress (e.g., battle damaged, located in inclement weather, and disoriented aircraft).

(5) Providing airspace management operations in support of manned and unmanned air operations for its designated airspace sector by providing updates of airspace information.

(6) Providing navigational assistance to friendly aircraft.

(7) Coordinating ATC procedures with military C2 agencies and civilian agencies or organizations, including the Federal Aviation Administration and ICAO.

(8) Providing personnel for a survey or reconnaissance party team; ensuring air traffic procedures, ATS equipment emplacement criteria, and TERPS are considered and addressed during the site survey.

(9) Providing personnel, as required, for integrated aviation planning and air operations management.

(10) Providing precision and nonprecision navigational aids.

(11) Providing essential situational awareness information for use in activating and executing the airfield base defense zone.

(12) Providing ATS subject matter experts to assist with the CAB's mission area relating to the joint force.

(13) Providing ATS operations across the conflict continuum, including civil support and homeland security operations facilitating restoration, revitalization, stability, and sustainment services.

5. Army Rapid Port Opening Element (RPOE)

Army RPOE is the surface element of joint task force-port opening (JTF-PO) whose mission is to assess the distribution network, clear the cargo ramp, organize the forward node up to 10 kilometers from the APOD, facilitate throughput, and provide in-transit visibility. The RPOE deploys for up to 60 days, until the mission is transitioned to HN or follow-on forces. See appendix I for a description of JTF-PO. The RPOE:

a. Provides a fully constituted force, prepared to deploy within 12 hours of initial notification.

b. Is tailorable to mission requirements for maximizing cargo throughput or minimizing the joint task force's footprint.

c. Maintains 100% cargo in-transit visibility from offload at the port of debarkation (POD) until it is distributed to the customer.

d. Establishes and maintains a common operational picture, providing supported forces and agencies with near real-time cargo data.

e. Establishes and maintains a radio frequency identification network for the POD.

f. Establishes a forward distribution node up to 10 kilometers from the POD.

g. Moves eight pallets per hour from the POD to the forward distribution node.

h. Receives, stages, and transloads up to 560 short tons in a 24-hour period.

i. Clears 150 passengers per every 6 hours through the APOD.

Appendix F
UNITED STATES MARINE CORPS CAPABILITIES

1. Overview

a. The United States Marine Corps (USMC) provides great versatility and flexibility to deal with situations across the range of military operations. Fighting as an integrated air-ground team, the Marine air-ground task force (MAGTF) is a task-organized force comprised of four elements: command element; ground combat element; aviation combat element (ACE); and combat service support element. The ACE's ability to deploy and operate in proximity to the fighting heightens the MAGTF's ability to project power. Potential operating sites range from urban areas containing established aviation facilities to areas with crude, austere facilities. The MAGTF requires responsive air support during all phases of its operations.

b. Marine aviation is expeditionary and, therefore, organizes, trains, and equips Marines for expeditionary operations. The ACE's expeditionary ability sets it apart from the aviation organizations of other Services. Marine aviation can operate from aircraft carriers; amphibious ships; or shore based, forward operating bases (FOBs). As an extension of sea-based aviation in littoral warfare, FOBs provide the ACE the capability to phase warfighting assets ashore in support of sustained operations, or it can provide shore-based support to naval campaigns in distributed operations. Essential to the success of FOBs are certain infrastructure and ground support requirements that facilitate flight operations, commonly referred to as aviation ground support (AGS). The Marine Corps has also perfected short-duration aviation support operations designed, expressly, to provide aviation rearming and refueling operations, commonly referred to as a forward arming and refueling point (FARP). FARPs can vary in size, scope, and duration; but they support a specific mission to minimize the response time and decrease turnaround time in support of a specific operation. FARPs are not enduring and only require minimal personnel and equipment for the specific mission. Figure 5 highlights some USMC site command scenarios.

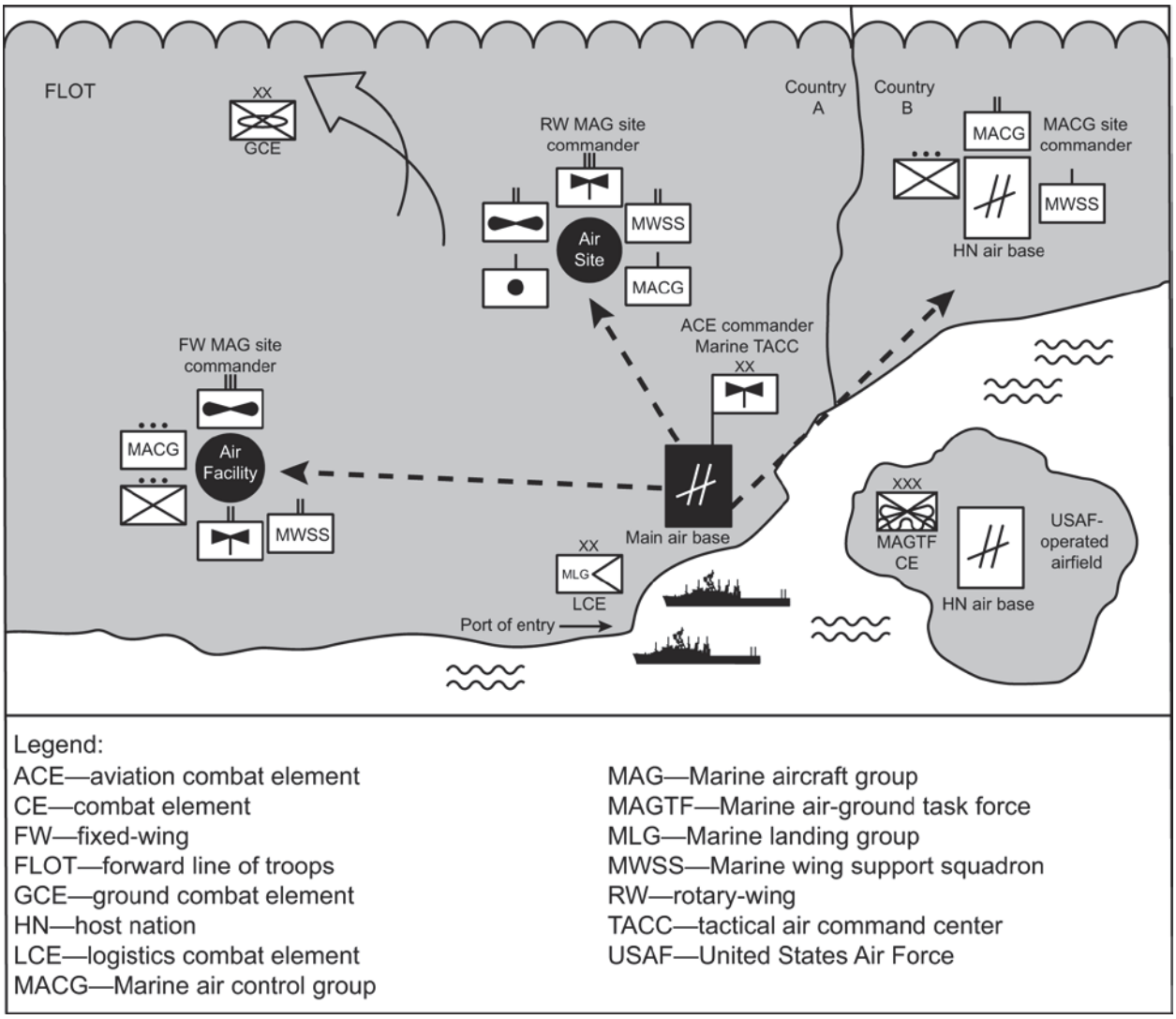


Figure 5. USMC Site Command Scenarios

2. Marine Wing Support Squadron (MWSS)

a. The MWSS commander provides AGS to enable the Marine aircraft group (MAG) commander, designated as the site commander, to generate sorties. AGS consists of ground support functions required (except aircraft supply, maintenance, and ordnance) for sustained air operations at FOBs and air bases. AGS directly supports employing the six functions of Marine aviation, making it the critical component that gives Marine aviation its expeditionary capability. AGS consists of numerous ground, functional capabilities that support MAGTF aviation assets in austere environments. Internal airfield service and airbase logistical requirements of attached and supported units are coordinated through the aviation ground support operations center (AGSOC). The Marine air control group (MACG) and Marine aviation logistics squadrons execute air traffic control (ATC) and aircraft maintenance, and supply, respectively.

b. The MWSS is a subordinate command of the MAG. The MWSS mission is to provide AGS to enable a MAG or a composite MAG, designated site commander, and supporting or attached elements of the MACG to conduct expeditionary operations. To support ACE units, the MWSS conducts the 11 AGS functions. They are: expeditionary airfield services, expeditionary firefighting and rescue, aircraft and ground refueling, explosive ordnance disposal, essential engineer services, internal airfield communications, medical services, air base commandant, motor transport, field messing, and airfield security operations.

c. The MWSS does not provide meteorological and oceanographic services; ATC; aircraft maintenance; aviation supply, chemical, biological, radiological, nuclear, and high-yield explosives defense; or law enforcement functions. Other elements of the Marine aircraft wing (MAW) or MAGTF provide these functions. The MWSS is structured to accomplish its missions in combat and is capable of task-organizing into detachments to meet specific mission requirements. The MWSS can establish and support one FOB and two FARPs simultaneously. The MWSS is organized into four operational companies with a headquarters staff. Each staff section conducts its traditional staff role with the operations and logistics sections responsible for the other functions.

d. The MWSS operates from an AGSOC and responds to the MAG/ACE commanding officer or site commander who it is assigned to support. The AGSOC is the nucleus for coordinating and executing AGS services for the ACE. From the AGSOC, the MWSS commander supervises the MWSS companies and manages squadron activities in accordance with the priorities established by the supported MAG commanding officer or site commander. The squadron S-3 runs the AGSOC, which includes representation from the squadron's other staff sections and subordinate companies (i.e., airfield operations, engineer, and motor transport). The S-3 must be able to receive, prioritize, assign, and track AGS activities. The AGSOC must be flexible to respond to changes in operations, tempo, and environment. The AGSOC processes AGS requests from supported units and tasks subordinate elements to respond to them. It manages the AGS effort and provides the command and control for other activities which are important to operations, including:

(1) Airfield operations.

(2) Airfield security operations.

(3) Base recovery after attack.

(4) Airfield damage repair (ADR) operations.

(5) FARP operations.

(6) Aircraft salvage and recovery operations.

(7) Base camp construction and repair.

(8) Base camp services for the ACE.

e. The AGSOC setup, internal functioning, and staffing are operationally driven and, therefore, change as the situation and the mission dictate. The AGSOC's operation is established in the unit's standing operating procedures.

3. Marine Air Traffic Control Detachments (MATCDs)

a. MATCDs are the principal terminal ATC organizations within the Marine air command and control system (MACCS). (See Marine Corps reference publication (MCRP) 3-20F, *Control of Aircraft and Missiles,* for more information.) In garrison, the MATCD is a subordinate element of the Marine air control squadron. An MATCD deploys as part of MACCS within a MAGTF, but may deploy independently or as part of a joint or coalition force, should the mission dictate. MATCDs also function as integral parts of a MAGTF or joint force integrated air defense system. (See MCRP 3-20F.7, *Marine Air Traffic Control Detachment Handbook,* for details.)

b. Each MATCD is organized and equipped to provide continuous, all-weather ATC services to an independent and geographically separated main air base or air facility, and two remote air sites or points. The MATCD includes the staff, controllers, technicians, and equipment under a single detachment commander. MATCD equipment is maintained by the technicians assigned to the MATCD and supported by Naval Air Systems Command.

c. MATCDs provide the full range of services from liaison at existing host nation, coalition, or joint air traffic control facilities; to augmenting existing facilities to increase interoperability and capability; to a full approach control with precision approach capability where no services existed. The MATCD may retain an embedded Marine air traffic control mobile team (MMT) to support additional requirements.

d. The MATCD deploys credentialed air traffic controllers that are trained and qualified at Marine Corps Air Stations. Each MATCD is collocated in garrison with an ATC facility, and the controllers assigned to the MATCD train at the facility under the Fleet Assistance Program. The MATCD will task organize for deployment to support specific mission requirements, in accordance with Naval Air Training and Operating Procedures Standardization (NATOPS) manning requirements. See NAVAIR 00-80T-114, *NATOPS Air Traffic Control Manual*.

4. MMTs

MMTs are trained and equipped to provide initial, rapid-response ATC and command, control, and communications to support MAGTF and joint missions. MMTs support operations at air sites, FARPs, and rapid ground refueling or lager points. As a standalone ATC capability, the MMT can task-organize to provide ATC services for airfield seizures, noncombatant evacuation operations, domestic or foreign humanitarian assistance operations, civil assistance operations, and other short-duration MAGTF or joint operations. Although often employed with other combat units, the MMT provides all self-sustainment equipment (for up to 72 hours) during initial operations. The MMT may serve as a precursor to a more robust capability from the MATCD. A MMT is assigned to each Marine expeditionary unit.

Appendix G
UNITED STATES AIR FORCE (USAF) CAPABILITIES

1. Overview

The USAF's airfield operations mission is to enable a full range of military operations from airfield seizure to closure or transition operations. The USAF, with the Air National Guard (ANG) component, provides safe, efficient, and effective airfield operations support to theater combat operations, similar to those fixed-based facilities provide in the continental United States (CONUS) and overseas. The USAF has a robust ANG component, which plays a key role in airfield operations and can be available to support theater operations. See table 12 for an overview of USAF airfield operations capabilities.

Table 12. USAF Airfield Operations Capabilities

	Landing Zone Operations	Airfield Geodetic Survey[1]	TERPS	Airfield Assessment[1]	Day and Night VFR[2]	Tactical Airfield Lighting	Limited IFR Services[2]	Full IFR Services[2]	PAR[3]	Airfield Management
STTs	X			X	X	X[4]				X[5, 6]
AEF[7]		X[8]	X	X	X		X	X	X[3]	X
ATCS/1st Combat Communications Squadron					X		X	X	X[3]	
ANG ATCS			X	X	X		X	X	X[3]	
Contingency Response Force	X			X	X	X[9]	X[10]			X

Notes:
1. This is a basic airfield survey or assessment conducted during the initial entry phase, which is not a formal geodetic survey, and cannot be used to gather data for TERPS certified approaches.
2. This requires high-intensity airfield lighting or host nation lighting. If neither is available, aircrew night vision device systems are required.
3. Air Force or ANG PAR controllers require SEI 365 and must be tasked to ensure qualified controllers are deployed.
4. STTs carry man portable, battery operated, short duration, airfield lighting (all others require tactical lighting systems or operational host nation systems). Use under visual meteorological conditions only.
5. This is limited to tactical airfield markings, lighting, runway surveillance, and landing surface evaluations.
6. Air Force airfield management personnel are tasked by the same command authority as ATC personnel.
7. Fixed-base unit type codes consist of personnel that join ATC equipment in the forward area or may be tailored via TPFDD to work in host nation or inter-Service facilities.
8. This is the responsibility of National Geospatial-Intelligence Agency Office of Geomatics.
9. Instrument meteorological conditions only.
10. This is limited to TACAN systems. There is no approach control or PAR function. It may be limited to non-radar operations that may hamper the operational tempo.

Legend:
AEF—air expeditionary force
ANG—Air National Guard
ATC—air traffic control
ATCS—air traffic control squadron
IFR—instrument flight rules
PAR—precision approach radar
SEI—special experience identifier
STT—special tactics team
TACAN—tactical air navigation
TERPS—terminal instrument procedures
TPFDD—time-phased force and deployment data
VFR—visual flight rules

2. Contingency Response Forces (CRFs)

a. CRFs are scalable to meet specific tasking requirements. Their capabilities include:

(1) Limited airfield assessment.

(2) Contingency response element (CRE) command and control (C2).

(3) Aerial port.

(4) Quick-turn aircraft maintenance.

(5) Force protection (FP).

(6) Intelligence.

(7) Airfield security.

(8) Airfield management.

(9) Air traffic control (ATC).

(10) Communications.

(11) Fuels.

(12) Medical.

(13) Financial management.

(14) Contracting.

(15) Supply.

b. CRFs are on 12-hour initial deployment requirements (36 hours for ANG) and will be used when there is limited planning time. CRF, and associated equipment, will be retrograded upon departure.

c. A CRF also may have mobility advisory roles that include air mobility division augmentation or standalone capability, Service mobility liaisons, and a partner-building capacity.

d. CRFs task organize based on mission requirements. In a planning framework, the terms contingency response group (CRG), CRE and contingency response team (CRT) are used frequently. The size and capabilities associated with these terms are explained in the following paragraphs. Understand, these are planning frameworks only. The deployed CRF is not beholden to the described size or structure. Commanders and planners will generate the forces required from the capabilities available to them and present them to the supported command as a CRF (possibly referred to as a CRT, CRE, or CRG) only to help describe the general size and capability of the force.

e. Consider the following CRF limitations.

(1) Working, parking, and contingency maximum (aircraft) on ground (MOG) vary for each mission.

(2) There is no organic aircraft rescue and firefighting.

(3) Beyond personal protective equipment, the CRF has no chemical, biological, radiological, and nuclear defense or detection capabilities .

(4) There is limited organic FP for airfield access control and self-defense. However, FP for the expanded base area depends on additional forces.

(5) Communications may be limited. Depending on the geographic location and crisis, worldwide access to cell phone and broadband global area network bandwidth may be limited due to high-demand commercial use.

(6) Sustained operations are limited because CRFs are equipped to be self-sufficient for the first five days of deployment.

f. CRF tasking to provide defense support of civil authorities (DSCA) and noncombatant evacuation operation (NEO) missions may occur.

(1) DSCA. CRFs may assist in DSCA operations. Homeland Security Presidential Directive 5, Management of Domestic Incidents, established new federal emergency management rules based on the requirement that all levels of government have a single, unified approach to managing domestic incidents. Such incidents may include the following conditions.

(a) Major disaster.

(b) Emergency.

(c) Fire management assistance.

(d) Catastrophic incident.

(e) Hazard.

(2) NEO. CRFs may support NEOs. NEOs assist the Department of State in evacuating United States citizens, Department of Defense (DOD) civilian personnel, and designated host nation (HN) and third country nationals whose lives are in danger, from locations in a foreign nation to a safe haven. Although considered in connection with hostile action, evacuation in anticipation of, or in response to, any natural or man-made disaster is possible.

3. Contingency Response Wing (CRW)

The CRW is the basis of USAF contingency airfield operations. The in-garrison structure of CONUS-based CRW include two CRGs split between two operating locations: Joint Base McGuire-Dix-Lakehurst, New Jersey; and Travis Air Force Base, California. Each operating location has one CRG consisting of two Contingency Response Squadrons and one Contingency Response Support Squadron.

a. Deployable CRF units normally are not used in a sustainment role.

b. CRWs normally do not change operational control.

4. CRG

a. The CRG mission is to assess; open; and, initially, operate airfields. The group consists of a force module dedicated to the airfield-opening task. This module includes a tailored selection of all forces needed after seizure, or handoff from

seizure forces, to assess an airfield, establish initial air mobility C2, and operate the flow of air mobility into and out of that airfield.

b. CRGs may open and operate airfields or airbases after seizure, or when needed to assess, open, and initially operate airbases in support of the USAF component of the combatant command. Operational control (OPCON) will not transfer. The CRG may represent senior USAF leadership initially. For this reason, an O-6 commands the CRG.

c. CRGs may open an airfield for the USAF, another Service, or a coalition partner. To ensure continuity of operations, CRGs should coordinate planning and agreements with the theater commander, commander USAF forces, or the joint force air component commander staffs.

d. CRGs are limited to a 60-day deployment cycle to complete transition to follow-on forces. CONUS-assigned CRGs maintain OPCON with the United States Transportation Command. Their primary capabilities include:

(1) Airfield assessment.

(2) Air mobility mission management, C2, and senior airfield authority (SAA).

(3) Aerial port support (cargo and passenger handling).

(4) Limited quick-turn aircraft maintenance.

(5) FP and limited airfield security.

(6) Intelligence.

(7) Airfield management.

(8) ATC.

(9) Communications.

(10) Navigational aids.

(11) Fuel servicing.

(12) Financial management (paying agent).

(13) Contracting.

(14) Supply.

(15) Airfield weather services.

(16) Special external capabilities (available for planning, but not immediately present in every unit). These include airborne, air assault, pathfinder, expanded combat communication, Rapid Engineer Deployable Heavy Operational Repair Squadron Engineer (RED HORSE), expeditionary engineering, and explosive ordnance disposal.

(17) CRF’s deploy with only five days of food, water, and diesel fuel. Resupply will be required by day six.

5. Pacific Air Forces (PACAF) and United States Air Forces in Europe (USAFE)-Specific CRGs

a. PACAF CRG. The PACAF organization is somewhat different than an Air Mobility Command controlled CRG. The PACAF CRG has four squadrons and a theater staff to support wing-type functions inside the CRG. The four squadrons include:

(1) RED HORSE. The RED HORSE squadron provides the theater construction capability and is associated with an ANG and a USAF Reserve RED HORSE unit.

(2) Security Force Squadron. The security force squadron is responsible for in-theater security force squadron training (e.g., fly away security teams, commando warrior, etc.) and containing the FP element for the CRG.

(3) Mobility Response Squadron. The mobility response squadron has limited aerial port and aircraft maintenance personnel assigned to it. Therefore, these positions may require augmentation from other PACAF units.

(4) Combat Communication Squadron. The combat communication squadron provides in-theater deployable communications for all PACAF.

b. USAFE CRG. The USAFE CRG is an in-garrison organization and deployable unit. The deployable size, organization, and mission are similar to other USAF CRGs. The in-garrison organization consists of three squadrons. They are:

(1) Air mobility squadron (which includes the operational and combat support mission elements of the aerial port, C2, and quick-turn maintenance).

(2) Security forces squadron.

(3) Construction and training squadron.

6. USAF Reserve and National Guard Bureau

a. The USAF Reserve and National Guard Bureau possess CRF capability. The ANG CRGs consist of in-garrison and deployable units. The in-garrison organization consists of a global mobility squadron, a global mobility readiness squadron, and airlift control flight (ALCF). The deployable size and mission are consistent with active-duty CRGs. See Air Force Tactics, Techniques, and Procedures 3-4.7, *Contingency Response,* for more information.

b. The CRG is an in-garrison organization and a deployable unit. The in-garrison organization consists of two squadrons, a global mobility squadron (GMS) and a global mobility readiness squadron (GMRS). The GMS includes the operational and combat support mission elements of the aerial port, C2, and quick-turn aircraft maintenance. The GMRS includes selected mission elements of agile combat support, such as security forces and other base operating support-integrator support roles.

7. CRE

a. A CRE is a deployed organization at forward locations where air mobility support is insufficient or nonexistent. A CRE's core capability sets consist of C2, aerial port,

and aircraft maintenance. CREs provide minimum essential on or offload and en route aircraft mission support during deployment, employment, and redeployment operations. The standard CRE is capable of supporting a working MOG of two with 24-hour C2 coverage.

b. The ANG ALCF is a temporary deployed organization established where air mobility operational support is nonexistent or insufficient. An officer, trained within the unit and certified by the commander, leads the ALCF. The core capability sets that define an ALCF are the same as those for a CRE. Aerial port and aircraft maintenance specialists will have to be obtained through through unit sourcing. ALCFs provide minimum, essential onload, offload, and en route aircraft mission support during deployment, employment, and redeployment operations. An ALCF can support a working maximum of two aircraft on the ground for 24 hours.

8. CRT

a. A CRT performs the same functions as a CRE, but on a smaller scale and with no aircraft maintenance capability. CRTs are led by an enlisted supervisor (E-7 or above) trained and certified by the unit's commander. A CRT can support a working MOG of one for 12 hours a day, but will maintain 24 hour a day C2 coverage.

b. An ALCF performs the same functions as a CRE, but on a smaller scale. The ALCF is led by an enlisted supervisor (E7-level or above) trained within the unit and certified by the commander. An ALCF is capable of supporting a MOG of one for 12 hours a day, but will maintain 24-hour C2 coverage. Contingency support elements will augment a CRT as required.

9. Assessment Team and Airfield Survey Team

a. An assessment team or airfield survey team accomplishes assessments to verify known information and evaluate and obtain any items that were not already assessed. Assessment teams compile and report results to higher headquarters, as directed, through appropriate command channels. Airfield surveys will address areas such as runways, ramps, taxiways, FP, communications, and facilities. Completed surveys provide a recommendation to decision makers on the suitability of future airfield operations (fixed or rotary wing). Team personnel should meet with representatives of the airfield seizure forces, HN, and follow-on forces to understand the supported commander's mission for the airfield and proposed layout.

b. The ANG ALCFs maintain the same capabilities and can be used in the same manner as an assessment team.

10. Joint Inspection

Joint inspection personnel deploy worldwide to support the air movement of hazardous cargo and equipment, in accordance with Defense Transportation Regulation 4500.9-R, Part III, *Mobility*, June 2016. Joint inspection personnel are specially trained and experienced aerial port personnel whose inspections ensure all documentation requirements are met and shipments are airworthy and safe for flight.

11. Air Traffic Control Squadrons (ATCSs) and Combat Communication Squadrons

a. The 53d ATCS is an Air Combat Command unit based at Robins Air Force Base, Georgia. The 53d ATCS provides combat-ready Airmen to enable airpower basing maneuverability and total force engagement across the full range of military operations through the deployable air traffic control and landing system (DATCALS) enterprise.

b. The 1st Combat Communication Squadron in Ramstein Air Force Base, Germany also possesses a DATCALS capability. However, the preponderance of DATCALS is supported by the ANG within 10 ATCS. All 10 squadrons are equipped with control towers, tactical air navigation systems, and approach radars. They are the USAF's interim airfield-opening response force and designed to provide an initial cadre of associated maintenance personnel. As such, they continually engage in the contingency planning process to help ease the transition from airbase opening planning and execution to airbase sustainment.

c. The 53d ATCS, 1st Combat Communications Squadron, and ANG ATCSs can provide a full range of ATC service and procedural and positive control capabilities. For additional information, see Air Force Doctrine Annex 4-0, *Combat Support, Airbase Opening Forces* and Air Force tactics, techniques, and procedures 3-4-4, *Contingency Airfield Operations*.

12. Special Tactics Squadron (STS)

The STS is a ground, special operations force maneuver element consisting of several special tactics teams (STTs). The primary STS missions are global access, precision strike, personnel recovery, and battlefield surgical operations.

a. Global access includes special reconnaissance or direct action in support of an airfield seizure to establish and control temporary lodgments for follow-on actions. STTs are comprised of combat controllers, pararescue, special operations weather teams, and select tactical air-control party units and are augmented with special operations surgical and evacuation teams. (For more information on STT augmentation, see Joint Publication 3-05, *Special Operations*.)

b. The STT can reconnoiter, survey, establish, and control landing zones; provide weather observations and forecasting; and provide battlefield trauma care. These forces operate in hostile environments that may be beyond the range of survivability limitations of other specialized USAF elements.

c. Consider quick relief on station with ATC forces to ensure their availability for follow-on, emergent combat missions. They employ with airfield seizure forces, CRGs, or unilaterally to provide terminal control of an airfield. These teams can sustain themselves for limited amounts of time before needing a resupply. Many combat control personnel are also qualified as joint terminal attack controllers. The highest ranking combat controller or special tactics officer can perform SAA duties.

13. The 820th Base Defense Group

This unit can provide fully integrated, highly capable, FP and response forces to support an expeditionary airfield opening. The unit is capable of airborne, air land, or air mobile insertion operations for up to 30 days and has the organic capability to provide airfield security and an initial airfield security assessment. The unit can partner with initial entry or base seizure forces engineering battalion to provide a smooth transition to airfield opening and sustainment of forces.

14. The USAF Civil Engineer Center Airfield Pavement Evaluation Team

This team conducts worldwide contingency, sustainment, and permanent level, airfield pavement evaluations. The team uses destructive and nondestructive techniques to assess pavement weight-bearing capacity and surface conditions. The team can rapidly deploy to provide pavement classification numbers and allowable gross load information for paved airfield surfaces, and certify airfield pavements up to 50,000 passes. Additionally, the team can proof load high-capacity aircraft anchoring systems; determine runway surface friction characteristics; and provide technical expertise and guidance for designing, repairing, and constructing airfield pavements in support of regional conflict operations. Operations support contingency operating locations, aerial ports, en route bases, or critical stateside bases; and include support for humanitarian relief operations. This team also conducts the Contingency Airfield Pavement Evaluation Training Course and certifies additional DOD evaluators. The team's equipment is C-130 and C-17 air-transportable and includes specialized rolling stock (i.e., heavy-weight deflectors, automated dynamic cone penetrometers, continuous-friction measurement equipment, and anchor testing kit components).

Appendix H
AIRFIELD ENGINEER FORCE CAPABILITIES

1. Overview

The United States Army, Marine Corps, Navy, and Air Force have expeditionary engineer capabilities which can construct, rebuild, or maintain airfields in support of a commander. This appendix portrays each of these Service's engineer capabilities and how they can support airfield operations.

2. US Army Engineer Capabilities

a. Army Engineers. The Army provides robust engineering planning and command capability ranging from theater engineer commands led by major generals, to colonel-level engineer brigades, through engineer battalions organic to maneuver brigade combat teams. Army engineer support to airfield openings ranges from providing forward aviation combat engineering operations (as a part of combat engineering) to planning, constructing or expanding, and maintaining airfields executing large-scale general engineering tasks. This includes providing geospatial information and services. Engineer units may be organic to a maneuver element or part of an airfield seizure team. Combat engineers may provide the following:

(1) Route or area clearance missions in support of airfield or forward arming and refueling point operations.

(2) General horizontal and vertical engineering (i.e., runway repair, expansion, surveying, and maintenance; and support infrastructure construction and maintenance).

(3) Special capabilities, including quarry operations, well drilling, power generation, structural firefighting, and diving operations.

b. United States Army Corps of Engineers (USACE). USACE provides technical engineering assistance to the operational force using its field force engineering capability. Field force engineering draws on USACE capabilities from the engineer disciplines (primarily general engineering) to support operations through reachback and forward presence. Field force engineering forward presence includes deployable teams designed and trained to provide technical engineering support. The USACE provides field-force engineering that consists of deployable civilian technical support teams and reach-back teams to provide base development and technical support provided by technically specialized personnel and assets. The USACE provides contract horizontal and construction services worldwide. Also, it provides contingency, real property estate support teams, procurement and lease program management, and environmental support teams.

3. United States Marine Corps (USMC) Engineer Capabilities

a. USMC engineer capabilities organic to a Marine wing support squadron (MWSS) support airfield services and base requirements of the aviation combat element (ACE) commander. The engineer company provides general engineering services, utilities services, heavy equipment, and material handling equipment services. The

engineer company also includes a drafting and survey capability to assist in designing the layout of airbase facilities and expeditionary airfields.

b. MWSS engineer personnel and equipment enable the MWSS commander to execute airfield and airbase requirements including:

(1) Construction and maintenance of fuel storage revetments, bunkers, aircraft parking areas, and expedient roads.

(2) Construction, improvement, and maintenance of vertical takeoff and landing and vertical short takeoff and landing facilities.

(3) Technical and equipment assistance for erecting and constructing prefabricated structures.

(4) Repair, improvement, and maintenance of bare-base airfields (e.g., airfield damage repair (ADR) or existing roads).

(5) Mobile electric power, refrigeration, water supply, and hygiene services.

(6) Limited combat engineer services.

(7) Soil stabilization and dust mitigation.

c. Reinforcement or augmentation become necessary when ACE engineering requirements exceed the capability or capacity of the MWSS. Primary augmentation will come from organic Marine air-ground task force assets including the Engineer Support Battalion or the naval construction force (e.g., naval mobile construction battalion).

4. US Navy Engineer Forces

The naval construction force's (NCF) engineering and construction capabilities for ADR are executed by the Naval Mobile Construction Battalion. The Naval Facilities Engineering Command (NAVFAC) provides the NCF engineering reach back capability to obtain a wide range of NAVFAC design expertise and construction contracting capability beyond the organic capabilities of the NCF.

a. The NCF's naval mobile construction battalion (NMCB) provides a full spectrum of horizontal and vertical engineering capabilities and limited combat engineering capabilities for the supported commander across all phases of military operations including, theater security cooperation, DSCA, humanitarian assistance disaster relief, construction in support of forward deployed naval forces, and exercises supporting regional partnerships with allied and partner nations.

b. The NMCB's mission sets include expeditionary, temporary, or permanent general engineering; limited combat engineering and construction missions in support of operations. These include the following.

(1) ADR (including battle damage repair).

(2) Advanced base facilities CONSTRUCTION and maintenance.

(3) Power generation and distribution.

(4) Vertical and horizontal construction.

(5) Water well drilling and water distribution, purification and storage.

(6) In times of emergency or disaster, the NMCB conducts foreign humanitarian assistance/DSCA and consequence management operations, including contingency public works support.

(7) Base construction and facility public works operations and maintenance.

(8) Civil engineer and construction support during stability, security, transition, and reconstruction operations.

(9) Bridging.

c. NAVFAC is a global military command with an headquarters and component commands that provide acquisition, facilities, and engineering and other technical support to the Navy, Marine Corps, US Government departments and agencies, JFCs, and other (e.g., DOD) clients.

d. NAVFAC provides forward elements dedicated to support JFCs and subordinate commanders in contingencies. While not part of the operating forces, NAVFAC supports combatant and component commanders by:

(1) Executing contract construction.

(2) Providing construction supplemental and contingency contracting capability for planning, designing, and executing construction.

(3) Providing technical support across a broad spectrum of engineering and scientific disciplines, including environmental restoration and Navy and Seabee logistics support.

e. NAVFAC has expeditionary capabilities in its contingency engineer response team, RC contingency engineer unit detachments, and mobile utilities support equipment.

f. NAVFAC provides a multitude of contingency engineering reach-back support services to the NCF, including:

(1) Structural analyses and damage assessments.

(2) Airfield repairs.

(3) Force protection.

(4) Water and wastewater treatment.

(5) Fire protection.

(6) Waterfront facilities.

(7) Amphibious systems.

(8) Real estate acquisition.

(9) Environmental services.

5. United States Air Force (USAF) Engineer Forces

a. Prime Base Engineer Emergency Force (Prime BEEF). These are modular teams capable of rapidly responding, worldwide, to provide the full range of engineering expertise and emergency services. These services are needed to establish, sustain, recover, and close bases for employing Air Force weapons systems or supporting joint interagency or multinational operations. Their capabilities include the following per Air Force Doctrine Annex 3-34, *Engineer Operations*.

(1) Constructing light horizontal and vertical structures.

(2) Erecting specialized structures.

(3) Performing pest and environmental management.

(4) Providing bare-base master planning, design, and contract support.

(5) Providing emergency services.

(6) Responding to hazardous materials issues.

(7) Fighting structural and aircraft fires.

(8) Rendering safe and removing unexploded ordnance.

(9) Defeating improvised explosive devices and chemical, biological, radiological, nuclear, and high-yield explosive (CBRNE) threats.

(10) Performing base recovery after an attack, including repairing airfields, facilities, or infrastructure system damage.

(11) Providing airfield pavement evaluation teams capable of performing airfields structural evaluations to determine suitability for aircraft operations. This includes different types of aircraft and the number of takeoffs and landings the airfields can support.

b. Rapid Engineer Deployable Heavy Operational Repair Squadron Engineer (RED HORSE). This is a self-sustaining, heavy construction unit staffed and equipped to provide highly mobile, rapidly deployable teams. These teams support force bed-down requirements and repair war damage, and are largely self-sufficient for limited periods (up to 30 days). These forces are theater engineer assets. They provide Commander, Air Force forces a dedicated, flexible, airfield and base heavy construction and repair capability that allows the unit control center to move and support missions as the order of battle dictates. RED HORSE capabilities include the following.

(1) Prime BEEF.

(2) Contracting.

(3) Logistical support.

(4) Secure communications.

(5) Food service.

(6) Supply.

(7) Medical.

(8) Special capabilities, including:

(a) Water-well drilling.

(b) Explosive demolition.

(c) Quarry operations.

(d) Concrete and asphalt batch operations and paving.

(e) Material testing and evaluation.

(f) Expedient horizontal and vertical construction.

(g) Initial site survey assessment.

(h) Site assessment for CBRNE threats and hazards.

(i) Obstruction removal.

(j) Airfield surface repair.

(k) Initial site survey assessment.

(l) Obstruction removal and demolition.

(m) Expedient airfield repair.

(n) Internal force protection.

(o) Limited CBRNE capabilities.

(p) Expedient pavement and airfield evaluations.

c. Air Force Civil Engineering Center Airfield Pavement Evaluation Team. This team provides a reach-back capability and forward-deployed technical expertise. It manages and directs the USAF pavement evaluation program that maintains an inventory of all identified airfield conditions, surface characteristics, and geospatial information associated with these landing surfaces. Airfield pavement evaluation teams complete detailed airfield evaluations to determine suitability for aircraft operations, including different types of aircraft and the number of takeoffs and landings airfields can support.

Table 13 provides a matrix of Service-specific engineer capabilities for airfields. The information comes from Joint Publication 3-34, *Joint Engineer Operations*.

Table 13. Matrix of Service Engineer Airfield Capabilities				
Functions	**USA*** (This information applies to the majority of baseline types, unless noted.)	**USMC*** (This information applies to the four unit types, unless noted.)	**USN*** (This information applies to the seven unit types, unless noted.)	**USAF*** (This information applies to the four unit types, unless noted.)
Build, repair, and maintain an expeditionary airfield.	P[2,3,4]	P[2,3]	P	P[1,2,3]
Perform airfield damage repair.	P[1,2,3]	P[2,3]	P	P[1,2]
Perform rapid runway repair.	P[1,2,3]	P[3]	P	P[1,2]
Improve and sustain airfields.	P[2,3,4]	P[2,3]	P	P[1]
Construct aircraft revetment and dispersal sites.	P[2,3]	P[2,3]	P	P[2]
Provide aircraft crash, fire, and rescue support.	P[3]	P[3]	N	P[1]
Install and maintain airfield lighting and navigating systems.	P[2,3,4]	P[3]	S	P[1,2]
Install, certify, and maintain aircraft arresting barriers.	P[2,3,4]	P[3]	P[1]	P[1,2]
Provide airfield planning.	P[2,3,4]	P[3]	P[2]	P[1,2]
	Key: (1 and 2 are baseline) 1 Combat 2 General 3 Specialized 4 Technical expertise (USACE)	Key: 1 CEB 2 ESB 3 MWSS	Key: 1 NAVFAC 2 Specialized	Key: 1 Prime BEEF 2 RED HORSE 3 Specialized

Notes:
*Information in this table reflects the highest engineer capability for each Service.
P—Primary capability: This is organic within the unit and a specified task within the mission of the unit. The unit is trained and equipped to accomplish this capability.
S—Secondary capability: The unit has a limited ability (i.e., training, expertise, and equipment) to accomplish the task. This is an implied task for the unit. This task is specified as a secondary role for the unit.
N—This is not a capability of this organization.

Legend:
AFCEC—Air Force Civil Engineer Center
CEB—combat engineer battalion
ESB—engineer support battalion
MWSS—Marine wing support squadron
NAVFAC—Naval Facilities Engineering Command
Prime BEEF—prime base engineer emergency force
RED HORSE—rapid engineer deployable heavy operational repair squadron engineer
USA—United States Army
USACE—United States Army Corps of Engineers
USAF—United States Air Force
USMC—United States Marine Corps
USN—United States Navy

Appendix I
UNITED STATES TRANSPORTATION COMMAND (USTRANSCOM) JOINT TASK FORCE-PORT OPENING (JTF-PO) CAPABILITIES

"When a joint task force (JTF) arrives to respond to a disaster, it is a behemoth of capability compared to all other interagency, international, and nongovernmental agencies. The unique capability that makes a JTF valuable is the ability to organize and execute logistics operations in a chaotic environment."

—Colonel James A. Vohr, United States Marine Corps, Director for Logistics, J-4, United States Southern Command

1. Overview

The JTF-PO is an enabling force capable of rapid deployment to establish and initially operate ports of debarkation, establish a forward distribution node, and optimize port throughput. It provides the supported geographic combatant commander (GCC), joint force commander (JFC), and combatant commander with an expeditionary aerial port of debarkation (APOD) deployment and forward distribution node capability consistent with the single port manager concept. The JTF-PO's capabilities are tailorable to support varying situations within the tasking authority's operational area. For detailed information regarding JTF-PO roles, responsibilities, and capabilities, see Joint Publication 4-01.5, *Joint Terminal Operations*. See figure 6 for a diagram of JTF-PO command and control relationships. See figure 7 for JTF-PO composition.

2. Capabilities

a. Joint assessment team (JAT) and JTF-PO air and surface elements are ready to deploy within 12 hours of unit notification. Subsequent units will be prepared to deploy and entered into an alert posture to fulfill any additional taskings within 96 hours.

b. JTF-PO includes the following initial port opening and distribution capabilities.

(1) Establishes a forward node (FN) not exceeding 10 kilometers from the APOD.

(2) Provides movement control, including coordination for onward movement of arriving cargo and passengers.

(3) Works a maximum on ground of two C-17 aircraft loads during 24/7 operations in no- or low-light conditions.

(4) Provides aircraft maintenance support.

(5) Establishes joint in-transit visibility and radio frequency identification network.

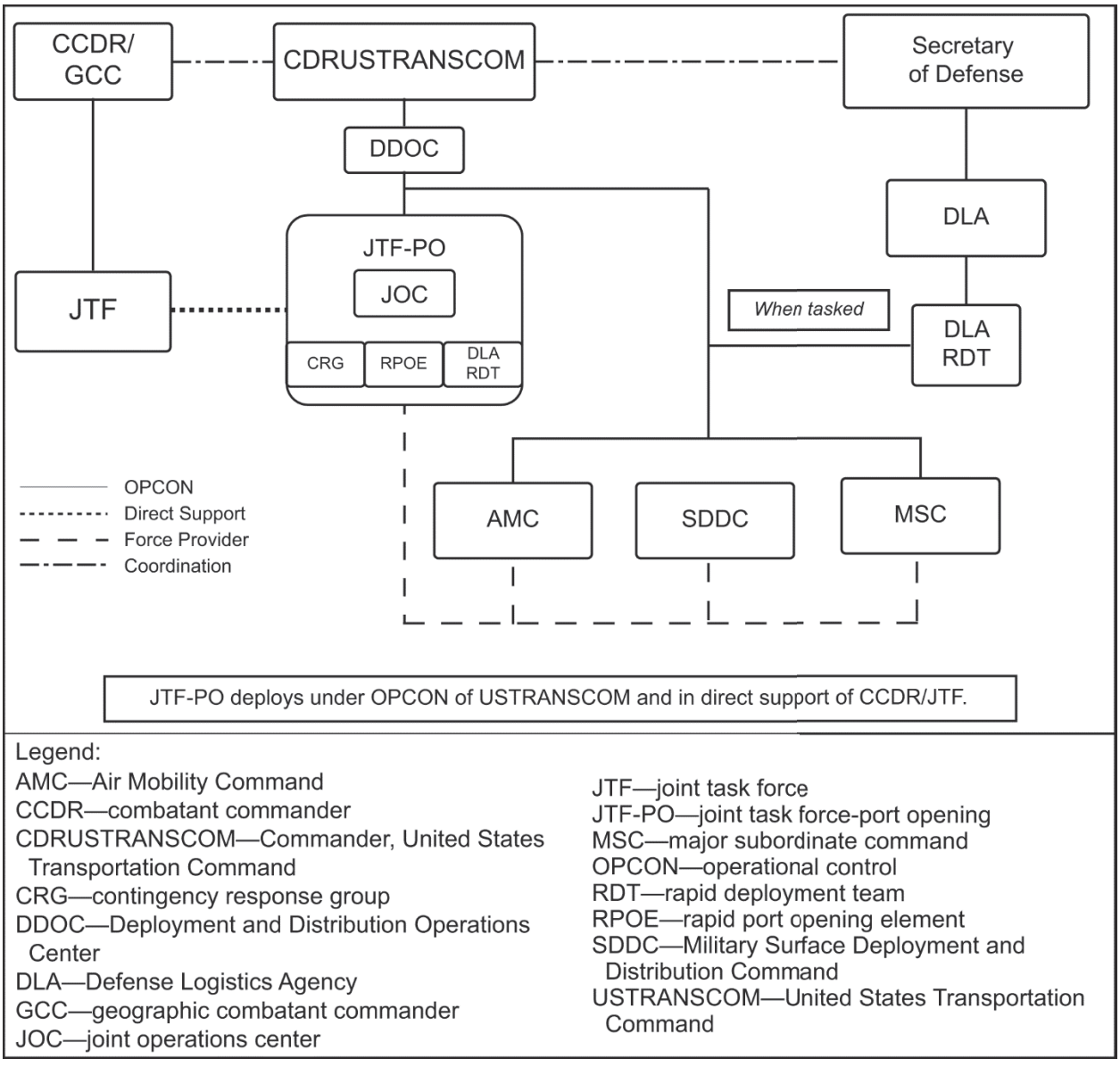
(6) Receives, stages, and transloads 560 short tons in a 24-hour period.

(7) Receives and processes 150 passengers every 6 hours.

c. The Defense Logistics Agency (DLA):

(a) A DLA rapid deployment team travels with JTF-PO to provide expertise and assistance with strategic-level logistics, including warehousing and procurement for all classes of supply in support of the assigned mission.

(b) If deployed with JTF-PO, DLA's rapid deployment team can provide the team expeditionary contracting capability and expertise. When deployed with JTF-PO, DLA can leverage existing strategic-level contracts, within the theater, to support the JFC or help establish provisional contracts to support mission requirements.



Legend:
AMC—Air Mobility Command
CCDR—combatant commander
CDRUSTRANSCOM—Commander, United States Transportation Command
CRG—contingency response group
DDOC—Deployment and Distribution Operations Center
DLA—Defense Logistics Agency
GCC—geographic combatant commander
JOC—joint operations center
JTF—joint task force
JTF-PO—joint task force-port opening
MSC—major subordinate command
OPCON—operational control
RDT—rapid deployment team
RPOE—rapid port opening element
SDDC—Military Surface Deployment and Distribution Command
USTRANSCOM—United States Transportation Command

Figure 6. JTF-PO Command and Control Relationships

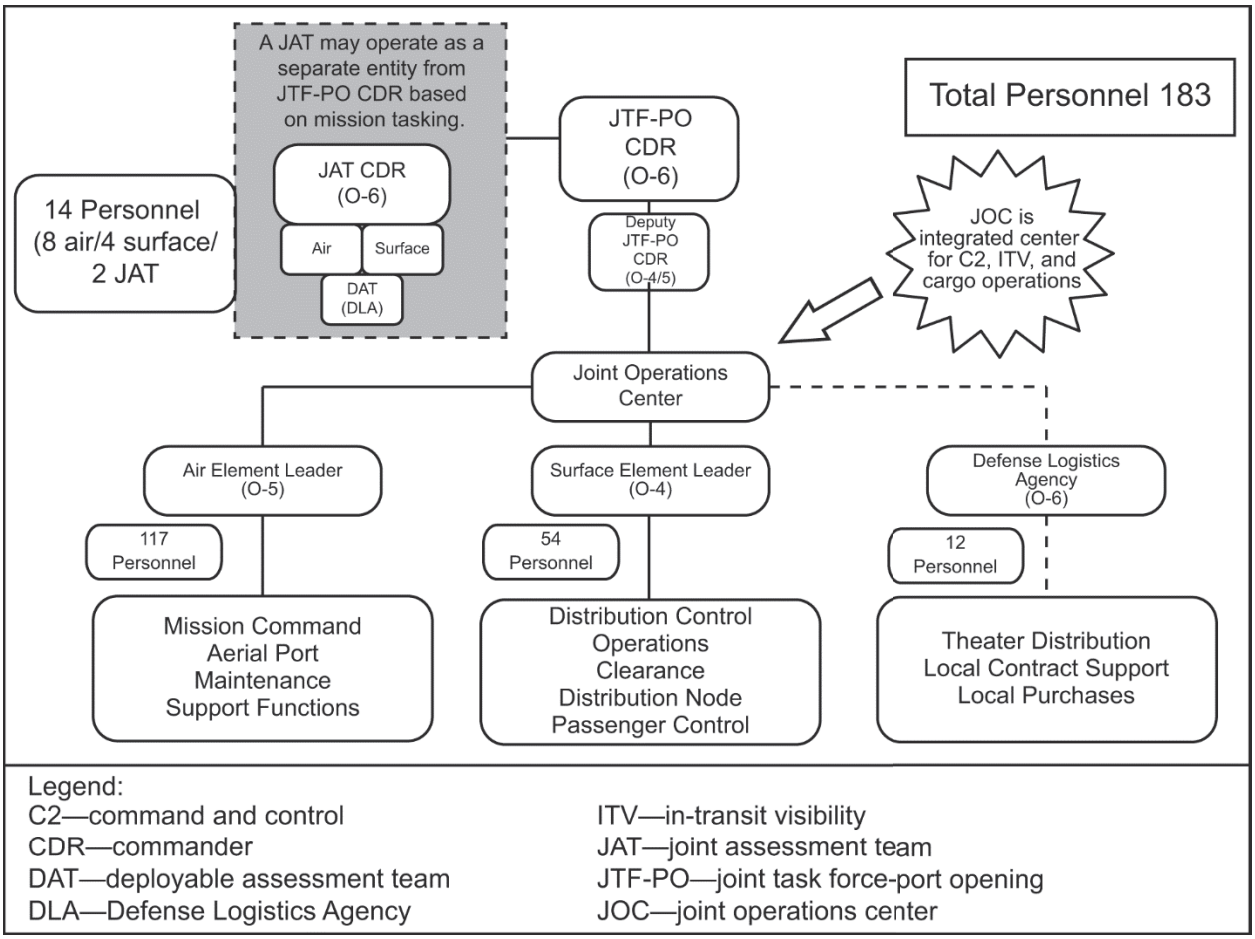


Figure 7. JTF-PO Composition

d. JTF-PO JAT.

(1) The JAT is the first JTF-PO element to deploy and is responsible for conducting an assessment of opening a deployment and distribution network at a designated APOD.

(2) The JAT will provide a go/no-go report to the Commander, USTRANSCOM within 4 hours of arrival to the port of debarkation. Additionally, the JAT will work with supported forces and agencies to determine which JTF-PO capabilities are required to support the mission. The go/no-go report will identify:

(a) If the APOD is able to handle the distribution mission.

(b) If augmentation is required before operations can commence (i.e., additional security, runway repair, etc).

(c) If additional time is needed before a decision can be made.

3. Planning

a. Mission planners should note the following when planning for tasked JTF-PO APOD missions.

(1) JTF-PO forces are ready to deploy within 12 hours.

(2) If the JAT deploys prior to the main body, it will work with the supported forces or agencies to identify the main-body JTF-PO airflow based on mission requirements.

(3) JTF-PO is an expeditionary force that will operate for up to 60 days before requiring relief by follow-on forces. Therefore, JFC planners must plan for and request sufficient forces to replace the JTF-PO enabling capability to ensure timely notification and arrival of replacement forces.

(4) Modular and scalable, JTF-PO APOD capabilities are tailored to meet the mission requirements and constraints.

(5) The mission planning team should use imagery and work with security forces and intelligence sources, during mission analysis, to identify potential threat areas. JTF-PO mission planners identify security requirements for APOD access and egress, and routes to and from the FN and living areas. Force protection measures for JTF-PO are coordinated with the GCC or JFC.

(6) The JTF-PO APOD is not a standing force and should only be formed when the mission dictates. Information on its mission, capabilities, and design is located in the USTRANSCOM JTF-PO Standing Execute Order and USTRANSCOM Instruction 10-27, Volume 2, *Joint Task Force Port Opening*. JTF-PO manages the entire mission: from planning, assessment, and execution to redeployment.

(7) Initially, the JTF-PO APOD facilitates joint reception, staging, onward movement, integration, and theater distribution by providing near real-time, in-transit visibility of arriving passengers and cargo and, expeditiously, clears the APOD. Such forward distribution node operations are critical components of GCC efforts to establish an effective distribution network within a theater of operations.

b. The JAT will require two C-130s or one C-17 (or equivalent) to deploy into the theater. Airflow requirements for the JTF-PO main body forces will be shaped by mission requirements and constraints.

Appendix J
SERVICE AIR TRAFFIC CONTROL (ATC) RATING AND CREDENTIALS

1. Overview

The Federal Aviation Administration (FAA) established the Air Traffic Safety Oversight Service under the Associate Administrator for Aviation Safety to provide independent oversight of the air traffic organization. A key component of this oversight is the credentialing program managed by air traffic oversight (AOV). This program covers personnel who perform direct safety-related ATC services or certify systems, subsystems, or services in support of the National Airspace System (NAS).

2. Background

Since its origin, Title 14, Code of Federal Regulations (14 CFR), *Aeronautics and Space*, part 65 required ATC tower operators must hold a control tower operator (CTO) certificate. In February 2015, 14 CFR, part 65 was amended and persons who hold an FAA credential, for the performance of their duties, are no longer required to hold a CTO certificate. This amendment formally established the FAA's transition from the CTO program. The purpose of the FAA credentialing and the CTO programs is to establish that air traffic controllers possess the requisite skills to do their jobs safely. However, the FAA AOV credentialing program is broader than the CTO program and includes tower and radar facility ratings. While an FAA credential is comparable to a CTO certificate, the two programs are different and require separate administrative activities. Credentials play a vital role in assuring the FAA provides the safest, most efficient NAS in the world. The credentialing system is a robust online data management system designed to maintain FAA credentials for nearly 20,000 air traffic controllers, airways transportation system specialists, and managers within air traffic organization. Table 14 shows the Service ATC credentials.

Table 14. Service Air Traffic Control Credentials

Function	Service							
	Army		Marine Corps		Navy		Air Force	
	Ratings	Qualifications	Ratings	Qualifications	Ratings	Qualifications	Ratings	Qualifications
Control Tower Facility								
Tower Supervisor	Shift Leader	As designated CTO/ATC SP	AOV* or as Designated	Tower Supervisor	Tower Supervisor with AOV	Tower Supervisor (All)	Watch Supervisor	E-5 with 4 year's experience
Local	CTO/ ATC SP	GC/FD/LC	AOV	Local	AOV	Local Control (GC and TD)	ATC SP	GC/FD/LC
Ground	CTO/ ATC SP	GC/FD/LC	AOV	Ground	AOV	Ground (GC)	ATC SP	GC/FD/LC
Flight Data	CTO/ ATC SP	GC/FD/LC	AOV	Tower Flight Data	AOV	TD	ATC SP	GC/FD/LC
Tower Coordinator							ATC SP	GC/FD/LC
Radar Facility								
Radar Supervisor			AOV	Radar Supervisor	AOV	Radar Supervisor	Watch Sup	E-5 with 4 year's experience and RAPC
Approach			AOV	Approach Controller (TRACON)	AOV	Approach Controller (TRACON)	ATC SP	RAPC
Arrival	ATC SP	GCA Controller	AOV	Arrival Controller (RATCF)	AOV	Arrival Controller (RATCF)	ATC SP	RAPC
Clearance Delivery						Clearance Delivery	ATC SP	RAPC
GCA Supervisor	ATC SP	As Designated					ATC SP	GCA Supervisor
GCA/PAR	ATC SP	GCA Controller	AOV	GCA Controller	AOV	GCA Controller	ATC SP	GCA Controller
Flight Data	ATC SP	GCA Controller	AOV	Radar Flight Data	AOV	Radar Flight Data	ATC SP	RAPC
En route Control			AOV		AOV	En route (FACSFAC)	ATC SP	En route

Legend:
AOV—Air Traffic Oversight
ATC—air traffic control
CTO—control tower operator
FACSFAC—Fleet Area Control and Surveillance Facility
FD—flight data
GCA—ground control approach
GC—ground controller
LC—local control
PAR—precision approach radar
RAPC—terminal radar approach control (Air Force)
RATCF—radar air traffic control facility
SP—specialist
TD—tower data
TRACON—terminal radar approach control facility (Navy/Marine)

Note: *AOV is synonymous with CTO in the Service components that have adopted this program.

Appendix K
AIRFIELD LAYOUT AND CHARACTERISTICS

1. Airfield and Heliport Planning and Design Guidance

a. The Unified Facilities Criteria (UFC) system provides planning, design, construction, sustainment, restoration, and modernization criteria, and applies to the military departments, the defense agencies, and the Department of Defense (DOD) field activities. All DOD projects employ UFC. All construction outside the United States (US) is governed by status-of-forces-agreements (SOFAs), host nation funded construction agreements, and in some instances, bilateral infrastructure agreements. Ensure compliance with the more stringent of the UFC, SOFA, and bilateral infrastructure agreements, as applicable.

b. UFC 3-260-01, *Airfield and Heliport Planning and Design*, provides standardized airfield, heliport, and airspace criteria for geometric layout, design, and construction of runways, helipads, taxiways, aprons, and related permanent facilities to meet sustained operations.

c. In addition to a local terminal instrument procedures (TERPS) review, existing facilities modifications, temporary construction, airfield surface modifications, maintenance or construction requiring equipment on- or near-the-airfield flying environment, and new facilities construction must be closely coordinated. Coordinate with the US Air Force major command; US Army Aeronautical Services Agency and US Army Aeronautical Services Detachment, Europe; and Naval Flight Information Group to determine the impact to existing and planned instrument approach and departure procedures. The criterion in UFC 3-260-01 does not address instrument flight procedures. TERPS evaluations and processes are described in Air Force instruction (AFI) 11-230, *Instrument Procedures*; Air Force manual (AFMAN) 11-225, *US Standard Flight Inspection Manual*; and Federal Aviation Administration (FAA) JO 8260.3C, *US Standard for Terminal Instrument Procedures*. Consider TERPS criteria when designing or modifying airfields and facilities on instrument flight rules (IFR) airfields.

2. Airfield Facilities

An aviation facility consists of four land-use areas: two airside facilities (landing and takeoff areas, aircraft ground movement, and parking areas) and two landside facilities (aviation maintenance and aviation operations support areas).

a. Landing and Takeoff Areas.

(1) Runways and Helipads. Landing and takeoff areas require either a runway or helipad. The landing and takeoff areas consist of the runway and helipad surfaces, shoulders, and overruns; the approach slope surfaces, safety clearances, and other imaginary airspace surfaces.

(a) Number of Runways. Aviation facilities have only one runway. Additional runways may be necessary to accommodate operational demands, minimize adverse wind conditions, or overcome environmental impacts. FAA AC 150/5060-5, *Airport Capacity and Delay*, provides methodologies for

calculating runway capacity in terms of annual service volume and hourly IFR or visual flight rules (VFR) capacity. Initiate planning efforts to analyze the need for more than one runway when it is determined traffic demand for the primary runway will reach 60 percent of its established capacity (FAA guidance).

(b) Number of Helipads. Sometimes at airfields or heliports, a large number of helicopters are parked on mass aprons or are in the process of takeoff and landing. When this occurs, there is a requirement to provide landing and takeoff facilities that permit more rapid launch and recovery operations than can otherwise be provided by a single runway or helipad. Increase efficiency by providing one or more of the following options. These are not the only options.

- Multiple helipads, hoverpoints, or runways.
- Rotary-wing runways in excess of 240 meters (800 feet) long.
- Landing lanes.

(2) Runway Location. Runway location and orientation are paramount to airport safety, efficiency, economics, practicality, and environmental impact. The degree of concern given to each factor influencing runway location greatly depends on meteorological conditions, adjacent land use and availability, airspace availability, runway type and instrumentation, environmental factors, terrain features and topography, and obstructions to air navigation.

(a) Obstructions to Air Navigation. The runway must have approaches that are free of obstructions. Plan runways so the ultimate airport development provides unobstructed navigation. Conduct a survey of obstructions to identify objects that may affect aircraft operations.

(b) Airspace Availability. Existing and planned instrument approach and departure procedures, control zones, and special use airspace and traffic patterns influence airfield layouts and runway locations. Construction projects for new airfields and heliports, or construction projects on existing airfields, have the potential to affect airspace. These projects require notification to the applicable airspace control authority to examine feasibility for conformance with, and acceptability into, the theater airspace system.

(c) Runway Orientation. Wind direction and velocity are major considerations for determining runway sites. To be functional, efficient, and safe, the runway should be oriented in alignment with the prevailing winds, to the greatest extent practical, to provide favorable wind coverage. Use wind data (obtained from local sources) for a period of not less than five years, as a basis for developing the wind rose shown on the airfield general site plan.

(3) Runway and Helipad Separation. The type of aircraft the runway serves dictates the lateral separation of a runway from a parallel runway, or parallel taxiway, helipad, or hoverpoint. UFC 3-260-01 contains runway and helipad separation criteria.

(4) Airfield Markings. Airfield marking is an invaluable form of nonverbal communication to aircrew and ground crew alike. Proper marking and lighting allows safe operation of aircraft and ground vehicles throughout the airfield. Runway markings differ from a VFR only runway to an IFR runway to a precision approach runway. For more information, refer to FAA AC 150/5340-1L, *Standards for Airport Markings* or Engineer Technical Letter (ETL) 04-2; *Standard Airfield Pavement Marking Schemes*, with Change 2; or ETL 94-01*, Standard Airfield Pavement Marking Schemes*.

(a) Runway Landing Designator. The runway landing designator identifies the end of a runway. It consists of one or two digits representing the whole number nearest the one-tenth of the magnetic azimuth along the runway centerline when viewed from the direction of approach (i.e., 183 degrees would have 18 as the designator). If the azimuth ends in 5 (i.e.,185 degrees) the designator may be either 18 or 19.

(b) Runway Centerline Marking. The runway centerline marking identifies the physical center of the runway width and provides alignment guidance to pilots during takeoff and landing operations.

(c) Runway Threshold Marking. The runway threshold marking closely identifies the actual beginning of the runway threshold used for landings.

(d) Runway Aiming Point Marking. The runway aiming point marking provides a visual aiming point for landing operations.

(e) Runway Touchdown Marking. This identifies the touchdown zone along a precision runway in 500-foot increments.

(f) Runway Edge Marking. This provides enhanced visual contrast between the runway edge and the surrounding terrain or runway shoulders, and delineates the width of suitable paved areas for runway operations.

(g) Runway Hold Lines. Runway hold lines show stopping points in a taxiway that provide deconfliction during takeoff and landing operations between arriving or departing aircraft and static aircraft preparing to depart or cross runways. The VFR hold line provides lateral traffic deconfliction. The instrument hold line provides lateral separation from arriving aircraft and prevents aircraft structures from interfering with instrument landing systems.

(h) Taxiway Centerline Markings. Taxiway centerline markings provide pilots continuous visual guidance to permit taxiing along a designated path.

(i) Taxiway Edge Markings. Taxiway edge markings are used to alert pilots where the demarcation line exists between usable pavement for taxi operations and to identify the edges of a taxi route.

(5) Airfield Lighting.

(a) Airfield lighting is required for operations at night and complements airfield markings. There are varying levels of airfield lighting including using overt and covert lights. Standard tactical lighting schemes for airfields are contained in Engineer Technical Letter (ETL) 09-6, *C-130 and C-17 Landing*

Zone (LZ) Dimensional, Marking, and Lighting Criteria, or AFI 13-217, *Drop Zone and Landing Zone Operations*.

(b) For permanent, long term airfields refer to FAA AC 150/5340-30H, *Design and Installation Details for Airport Visual Aids*.

(6) Runway Instrumentation (Navigational Aids (NAVAIDS) and Lighting). NAVAIDS and airfield lighting are integral parts of an airfield. Consider NAVAID location, airfield lighting, and grading requirements of a NAVAID when locating and designing runways, taxiways, aprons, and other airfield facilities. UFC 3-260-01, table B16-1, includes a list of design documents governing NAVAIDS and lighting and the agency for obtaining site position and design information.

(a) NAVAIDS require land areas of specific sizes, shapes, and grades to function properly and remain clear of safety areas. NAVAIDS assist the pilot in flight and during landing. Instrumented runway studies dictate the type of air NAVAIDS installed at an aviation facility.

(b) Remote or standalone landing sites may require a lighting equipment vault for airfields and heliport facilities with NAVAIDS.

(c) Airfields with NAVAIDS require a NAVAIDS building. A separate facility houses each type of NAVAIDS equipment. UFC 3-260-01 lists technical advice and guidance for air NAVAIDS.

b. Aircraft Ground Movement and Parking Areas. These consist of taxiways and aircraft parking aprons.

(1) Taxiways. Taxiways provide free ground movement to and from runways, helipads, maintenance, cargo, passenger, and other areas of the aviation facility. The objective of taxiway system planning is to create a smooth traffic flow. This system allows unobstructed ground visibility; a minimum number of changes in aircraft taxiing speed; and, ideally, the shortest distance between the runways or helipads and apron areas.

(a) Taxiway System. The taxiway system is comprised of entrance and exit taxiways; bypass, crossover taxiways; apron taxiways and taxi lanes; hangar access taxiways; and partial-parallel, full-parallel, and dual-parallel taxiways. UFC 3-260-01, chapter 5 provides design and layout dimensions for various taxiways.

(b) Taxiway Capacity. At airfields with high levels of activity, the capacity of the taxiway system can become the limiting operational factor. Enhance or improve runway capacity and access efficiency by installing parallel taxiways. Provide a full-length parallel taxiway for a single runway, with connecting lateral taxiways, to permit rapid entrance and exit of traffic between the apron and the runway. At facilities with low air traffic density, a partial-parallel taxiway or mid-length exit taxiway may suit local requirements. Develop plans for construction of a full-parallel taxiway when such a taxiway is justified.

(c) Runway Exit Criteria. The number, type, and location of exit taxiways are functions of the required runway capacity. Provide exit taxiways at the ends

and in the center and midpoint on the runway. Provide additional locations, as necessary, to allow landing aircraft to exit the runway quickly.

(d) Dual-Use Facility Taxiways. Apply fixed-wing criteria for taxiways at airfields supporting fixed- and rotary-wing operations.

(e) Paved Taxiway Shoulders. Paved taxiway shoulders reduce the effects of jet blast on areas adjacent to the taxiway. Paved taxiway shoulders help reduce ingestion of foreign object debris into jet intakes.

(f) Traffic Deconfliction. Establish a controlled movement area to deconflict ground and aircraft traffic.

(2) Aircraft Parking Aprons. Aircraft parking aprons are the paved areas required for aircraft parking, loading, unloading, and servicing. They include the necessary maneuvering area for access into and exit out of parking positions. Design aprons to permit safe and controlled movement of aircraft under their own power. Mission requirements dictate aircraft apron dimensions and size. AFMAN 32-1084, *Facility Requirements*, Section D, Apron Criteria, provides additional information concerning Air Force aprons.

(a) Requirement. Individually design aprons to support specific aircraft and missions at specific facilities. The size of a parking apron depends on the type and number of aircraft authorized. UFC 3-260-01, chapter 6 provides additional information on apron requirements.

(b) Location. Aircraft parking aprons are located between the parallel taxiway and the hangar line. The apron location, with regard to airfield layout, will adhere to the operations and safety clearances provided in UFC 3-260-01, chapter 6.

(c) Capacity. Information in UFC 3-260-01, Appendix B, Section 2; UFC 2-000-05N, Facility Planning Criteria for Navy/Marine Corps Shore Installations, Appendix E, Airfield Safety Clearances; and AFMAN 32-1084 discuss aircraft parking capacity.

(d) Clearances. Provide lateral clearances for parking aprons from all sides of aprons to fixed and mobile objects.

(e) Access Taxi Lanes, Entrances, and Exits. UFC 3-260-01, chapter 6 provides the dimensions for access taxi lanes on aircraft parking aprons. Two should be the minimum number of exit and entrance taxiways provided for any parking apron.

(f) Aircraft Parking Schemes. Park aircraft in rows on a mass parking apron. The recommended tactical or fighter aircraft parking arrangement is to park aircraft at 45-degree angles. This is the most economical parking method for achieving the clearance needed to dissipate jet blast temperatures and velocities to levels that will not endanger aircraft or personnel. (For the Navy, these are 38 degrees Celsius (100 degrees Fahrenheit) and 56 kilometers per hour (35 miles per hour) at breakaway (intermediate power).)

(g) Departure Sequencing. Establish formal aircraft egress patterns from aircraft parking positions to the apron exit taxiways to prevent congestion at the apron exits. For example, aircraft departing from one row of parking positions should taxi to one exit taxiway; simultaneously, allowing other rows to taxi to a different exit.

(h) Army and Navy Aprons. Three categories of Army aircraft parking aprons exist: unit, general purpose, and special purpose. Base the category on the facility's mission support requirement. The following information explains the categories.

- Unit Parking Apron. The unit parking category supports fixed- and rotary-wing aircraft assigned to the facility.
- General Purpose Apron. This is an aviation facility anticipating transient parking with no tenant units assigned and provides a personnel loading apron or aircraft general-purpose apron in lieu of a mass parking apron.
- Special Purpose Apron. Provide special purpose aprons for specific operations, such as safe areas for arming and disarming aircraft and other specific mission requirements that demand separation of, or distinct handling procedures for, aircraft.

c. Aircraft Maintenance Area. An aircraft maintenance area is required when regularly performing aircraft maintenance at an aviation facility. Base the space requirements for maintenance facilities on aircraft type.

(1) Aircraft Maintenance Facilities. The aircraft maintenance facility includes the following. (The aircraft maintenance areas include utilities, roadways, fencing, and security facilities, and lighting.)

(a) Aircraft maintenance hangars.

(b) Special purpose hangars.

(c) Hangar access aprons.

(d) Weapons system support shops.

(e) Aircraft system testing and repair shops.

(f) Aircraft parts storage.

(g) Corrosion control facilities.

(h) Special purpose maintenance pads.

(2) Air Force and Navy Aviation Maintenance Buildings. For aviation maintenance building information, see AFMAN 32-1084 (Air Force), or UFC 4-211-01N, *Aircraft Maintenance Hangars: Type I, Type II and Type III*, (Navy).

(3) Army Aviation Maintenance Buildings.

(a) Maintenance Hangars. Maintenance hangars are required to support aircraft maintenance, repair, and inspection activities under complete cover.

The number of assigned aircraft determines the size requirement for maintenance hangars.

(b) Security and Storage Hangars. These hangars are limited in use and do not require the features found in maintenance hangars.

(c) Avionics Maintenance Shop. These provide avionics maintenance space within the maintenance hangar; however, it is important to provide a separate building for consolidated avionics repair at aviation facilities with multiple units.

(d) Engine Repair and Test Facilities. Engine repair and test facilities reside at air bases with aircraft engine removal, repair, and testing requirements. Those positioning engine test facilities on sites should consider the impact of jet blast and provide jet blast protection and noise suppression.

(e) Parts Storage. Provide covered aircraft parts storage at all aviation facilities and located close enough to the maintenance area to allow easy access to end users.

(4) Apron Lighting. Provide apron area lighting (floodlights) when aircraft movement, maintenance, and security are required at night and during poor visibility. The amount of apron space or number of aircraft positions that receive active use during nighttime operations determines the type of lighting required.

(5) Security. The hangar line represents the boundary of the airfield operations area. Maintenance buildings should be located close together to discourage unauthorized access and enhance facility security.

d. Aviation Operations Support Area.

(1) Aviation Operations Support Facilities. Aviation operations support facilities include facilities that directly support the flying mission. Operations support includes the following.

(a) Air traffic control.

(b) Aircraft rescue and firefighting.

(c) Fueling facilities.

(d) The airfield operations center and airfield management facility.

(e) Squadron operations and aircraft maintenance units.

(f) Air mobility operations groups.

(2) Location. Aviation operations support facilities should be located along the hangar line, with the central area allocated to airfield operations (i.e., airfield management facility), air traffic control, aircraft rescue and firefighting, and flight simulation. Aircraft maintenance facilities should be located on one side of the runway to allow simplified access among maintenance areas, aircraft, and support areas.

(3) Orientation of Facilities. Facilities located either parallel or perpendicular to the runway use space most efficiently. Diagonal and curved orientations tend to divide an area and result in awkward or unusable spaces.

(4) Multiple Supporting Facilities. When multiple aviation units are located at one facility, retain their integrity by locating the units adjacent to each other.

(5) Transient Facilities. Make provisions for transient and very important person aprons and buildings. These facilities should be located near the aviation operations supporting facilities.

(6) Other Support Facilities. When required, site other support facilities (such as aviation fuel storage and dispensing, heating plants, water storage, consolidated parts storage, and motor pools) on the far side of an access road parallel to the hangar line.

(a) Air Traffic Control Facilities. Determine the site and height of the air traffic control tower cab by conducting an operational assessment with an Army air traffic control activity; and in accordance with UFC 4-133-01N, *Navy Air Traffic Control Facilities*, for the Navy and Marine Corps. Site Air Force air traffic control towers in accordance with UFC 3-260-01, appendix B, section 17.

(b) Radar Buildings. Some airfields are equipped with a radar capability. Provide space for radar equipment when the functional proponent determines the need for radar capability. Provide space for radar equipment in the flight control tower building.

(c) Aircraft Rescue and Fire Facilities. Support airfield facilities and flight operations with fire and rescue equipment. The aircraft rescue and fire facilities must be located strategically to allow aircraft firefighting vehicles to meet response time requirements to all areas of the airfield. Coordinate the airfield fire and rescue facility and special rescue equipment with the facility protection mission and master plan. It may be economically sound to develop a consolidated or expanded facility to support airside and landside facilities. The site of the fire and rescue station must permit ready access of equipment to the aircraft operational areas and the road system serving the airfield facilities. A centrally located site, close to the midpoint of the runway, and near the airfield operations area (airfield management and base operations building (Air Force)) and air traffic control tower, is preferred.

(d) Rescue and Ambulance Helicopters. With the increasing use of helicopters for emergency rescue and air ambulance services, consider providing an alert helicopter parking space near the fire and rescue station. This space may be part of the fire and rescue station or in a designated area on an adjacent aircraft parking apron.

(e) Hospital Helipad. Site a helipad in proximity to each hospital to permit helicopter access for emergency use. Subject to necessary flight clearances and other hospital site factors, the hospital helipad should permit reasonably direct access to and from the hospital emergency entrance.

(f) Miscellaneous Buildings. Provide these buildings as part of an aviation facility: an airfield operations building, an aviation unit operations building (Army), a squadron operations building (Air Force), and a weather station. Determine authorization and space allowances in accordance with directives for each Service.

(7) Aircraft Fuel Storage and Dispensing.

(a) Location. Provide aircraft fuel storage and dispensing facilities at all aviation facilities. Provide operating fuel storage tanks wherever dispensing facilities are remotely located from bulk storage. Bulk fuel storage areas require locations that are accessible by tanker truck, tanker rail car, or watercraft. Provide space for parking and loading vehicles used to service aircraft within the bulk and operating storage areas.

(b) Safety. Fuel storage and operating areas have requirements for minimum clearances from buildings, aircraft parking, roadways, radar, and other structures or areas, as established in Service directives. Aviation fuel storage and operating areas also require lighting, fencing, and security alarms. All liquid fuel storage facility locations must address spill containment and leak protection and detection.

(8) Roadways to Support Airfield Activities.

(a) General. Vehicular roads on airfields should not cross or be within the lateral clearance distance for runways, high-speed taxiways, and dedicated taxiways for alert pads. This will prevent normal vehicular traffic from obstructing aircraft in transit. Roads should be located so surface vehicles will not be hazards to air navigation and air navigation equipment.

(b) Rescue and Firefighting Roadways. Provide rescue and firefighting access roads for unimpeded, two-way access for rescue and firefighting equipment to potential accident areas. Connecting these access roads to the airfield operational surfaces and other airfield roads, to the greatest practical extent, will enhance fire and rescue operations. Dedicated rescue and firefighting access roads are all-weather roads designed to support vehicles traveling at normal response speeds.

(c) Fuel Truck Access. Fuel truck access points to aircraft parking aprons should be located to provide minimal disruptions and hazards to active aircraft movement areas. Fuel truck access from the facility boundary to fuel storage areas should be separate from other vehicular traffic. Park fuel trucks as close to the flight line as is reasonably possible.

(d) Explosives and Munitions Transfer to Arm and Disarm Pads. Transfer explosives and munitions from storage areas to arm and disarm pads on dedicated transfer roads (i.e., roads used exclusively by explosives and munitions transfer vehicles).

(9) Navy and Marine Corps Exemptions from Waivers. Certain NAVAIDS and operational aids are placed at sites in violation of airspace clearance to operate effectively. The following aids are within this group and require no waiver if they

are positioned at sites in accordance UFC 3-535-01, *Visual Air Navigation Facilities*, or UFC 3-535-02, *Design Drawings for Visual Air Navigation Facilities*.

(a) Approach lighting systems.

(b) Visual approach slope indicator systems.

(c) Precision approach path indicator systems.

(d) Permanent optical lighting system, portable optical lighting system, and Fresnel lens equipment.

(e) Runway distance markers.

(f) Arresting gear systems, including arresting gear signs.

(g) Taxiway guidance, holding, and orientation signs.

(h) All beacons and obstruction lights.

(i) Arming and de-arming pad.

3. Service Requirements

When criteria in UFC 3-260-01 differ among the Services, the criteria for the specific Service are noted in the following paragraphs. For the Air Force, the airfield manager must sign all work orders processed for work within the airfield environment before it may proceed, in accordance with UFC 3-260-01, paragraph 1-9, "USAF Work Order Coordination and Authorization."

a. Theater of Operations. Standards for theater-of-operations facilities are contained in US Army technical manual (TM) 3-34.48-1, *Theater of Operations: Roads, Airfields, and Heliports-Road Design*, TM 3-34-48-2, *Theater of Operations: Roads, Airfields, and Heliports-Airfield and Heliport Design,* and UFC 3-260-01, section 7 for C-17 and C-130 landing zones. The information in UFC 3-260-01, section 7 supersedes the information in the field manual.

b. Security Considerations for Design. Regulatory requirements for asset security can significantly influence airfield and heliport planning and design. The arms, ammunition, explosives, and electronic devices associated with aircraft, and the aircraft themselves, require varying types and levels of protection. Operational security of the airfield is also a consideration.

(1) Integrating Security Measures. Integrate protective features into the airfield planning and design process to minimize problems with aircraft operations and safety requirements. These include barriers, fences, lighting, access control, intrusion detection, and assessment. (UFC 3-260-01, chapter 2 and UFC 4-010-01, *DOD Minimum Antiterrorism Standards for Buildings*, provide more discussion.) The protective measures should be included in the design based on risk and threat analyses with an appropriate level of protection, or should comply with security-related requirements.

(2) Security-Related Requirements. A detailed discussion of security-related requirements is beyond the scope of UFC 3-260-01. Designers should refer to Service security regulations for planning and design guidance.

4. Bare-Base Airfields

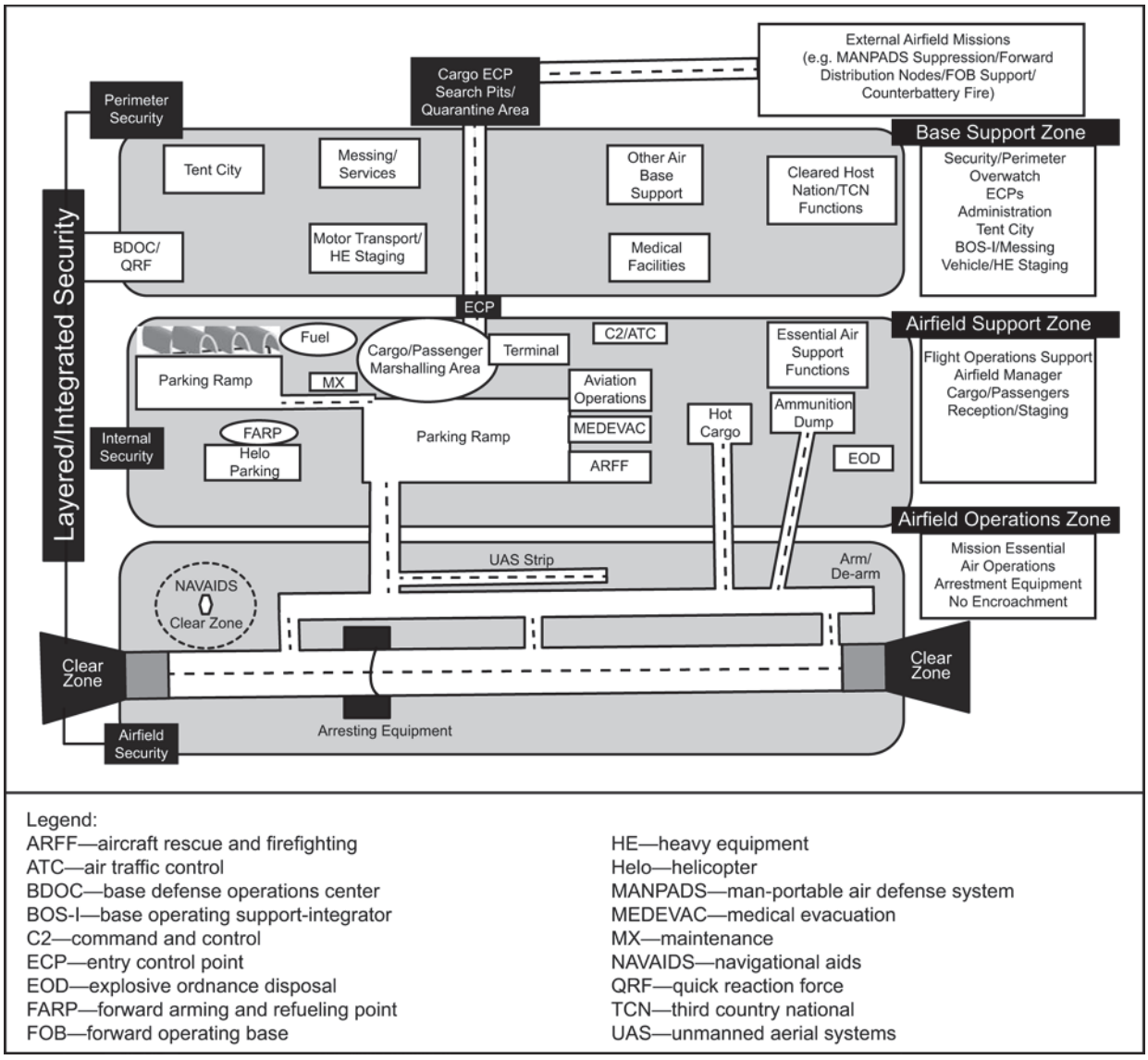
a. A bare-base airfield is a site with a usable runway, taxiway, parking areas, and source of potable water. It must be capable of supporting assigned aircraft and providing other mission-essential resources, such as a logistical support and services and an infrastructure composed of people, facilities, equipment, and supplies. This concept requires mobile facilities, utilities, and support equipment that can be deployed and installed rapidly.

b. The bare-base concept is more important than ever before. Many underdeveloped, foreign nations resist development of major fixed installations on their soil. However, these underdeveloped nations may have runways, taxiways, and air terminal facilities to offer US forces during contingency situations. US forces must be able to transform undeveloped real estate into an operational air base virtually overnight.

c. There are, roughly, 1,200 bare-base airfields in the world that could support air operations, although many bare bases are limited and inadequate. Since most underdeveloped nations are subject to aggression, the military must be able to deploy and operate from their own facilities.

d. During contingency operations, efficient and effective use of limited airfield capacity and resources is often critical to a successful military response. The task is complicated when foreign airfields are hosts to a variety of allied military, nongovernmental organizations, and commercial air activities. To achieve a unity of effort for airfield operations, there should always be a senior airfield authority appointed for each airfield.

e. Figure 8 is an example of a layout that depicts how airbase functions can be layered around an airfield to balance operations, support, and security considerations. The layout serves as a sketch and provides a guideline for setting up operations in a way that allows the mission to continue while minimizing disruptions as the base and airfield develop and expand.



Legend:

ARFF—aircraft rescue and firefighting	HE—heavy equipment
ATC—air traffic control	Helo—helicopter
BDOC—base defense operations center	MANPADS—man-portable air defense system
BOS-I—base operating support-integrator	MEDEVAC—medical evacuation
C2—command and control	MX—maintenance
ECP—entry control point	NAVAIDS—navigational aids
EOD—explosive ordnance disposal	QRF—quick reaction force
FARP—forward arming and refueling point	TCN—third country national
FOB—forward operating base	UAS—unmanned aerial systems

Figure 8. Notional Airfield Layout

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GLOSSARY

PART I – ABBREVIATIONS AND ACRONYMS

A

ACE	aviation combat element
ADCON	administrative control
ADR	airfield damage repair
AF	Air Force
AFCEC	Air Force Civil Engineer Center
AFI	Air Force instruction
AFMAN	Air Force manual
AFTTP	Air Force tactics, techniques, and procedures
AGS	aviation ground support
AGSOC	aviation ground support operations center
ALCF	airlift control flight
ALSA	Air Land Sea Application Center
AMC	Air Mobility Command
AMCI	Air Mobility Command instruction
AMLO	air mobility liaison officer
ANG	Air National Guard
AO	area of operations
AOB	airfield operations battalion
AOC	air operations center
AOV	air traffic oversight
APE	airfield pavement evaluation
APOD	aerial port of debarkation
ARFF	aircraft rescue and firefighting
ASCC	Army Service component commander
ATC	air traffic control
ATCS	air traffic control squadron
ATP	Army techniques publication
ATS	air traffic service

B

BaS&E	base support and expeditionary

BASH	bird aircraft strike hazard
BCT	brigade combat team
BDOC	base defense operations center
BOS	base operating support
BOS-I	base operating support-integrator
BSZ	base security zone

C

C2	command and control
CAB	combat aviation brigade
CAOC	combined air operations center
CASEVAC	casualty evacuation
CBRNE	chemical, biological, radiological, nuclear, and high-yield explosives
CCDR	combatant commander
CD&I	Combat Development and Integration
CDRUSTRANSCOM	Commander, United States Transportation Command
CFR	Code of Federal Regulations
CONUS	continental United States
C-RAM	counter-rocket, artillery, mortar
CRE	contingency response element
CRF	contingency response force
CRG	contingency response group
CRT	contingency response team
CRW	contingency response wing
CTO	control tower operator

D

DATCALS	deployable air traffic control and landing system
DC	Deputy Commandant
DLA	Defense Logistics Agency
DOD	Department of Defense
DR	disaster relief
DSCA	defense support of civil authorities
DSN	Defense Switched Network

DZ	drop zone
	E
EMCON	emission control
EOD	explosive ordnance disposal
ESSP	expeditionary site survey process
ETL	Engineer Technical Letter
EXORD	execute order
	F
FAA	Federal Aviation Administration
FARP	forward arming and refueling point
FN	forward node
FOB	forward operating base
FP	force protection
FW	fixed-wing
	G
GC	ground controller
GCA	ground control approach
GCC	geographic combatant commander
GDSS	global Decision Support System
GLO	ground liaison officer
GMRS	global mobility readiness squadron
GMS	global mobility squadron
GNSS	global navigation satellite system
	H
HA	humanitarian assistance
HAZMAT	hazardous materials
HHQ	higher headquarters
HN	host nation
HQMC	Headquarters, Marine Corps
	I
ICAO	International Civil Aviation Organization
IFR	instrument flight rules
	J, K
JAT	joint assessment team

JFACC	joint force air component commander
JFC	joint force commander
JP	joint publication
JTF	joint task force
JTF-PO	joint task force–port opening

L

LeMay Center	Curtis E. LeMay Center for Doctrine Development and Education
LZ	landing zone

M

MACCS	Marine air command and control system
MACG	Marine air control group
MAG	Marine aircraft group
MAGTF	Marine air-ground task force
MATCD	Marine air traffic control detachment
MAW	Marine air wing
MCRP	Marine Corps reference publication
MCTP	Marine Corps tactical publication
MEDEVAC	medical evacuation
MMT	Marine air traffic control mobile team
MOG	maximum (aircraft) on ground
MTTP	multi-Service tactics, techniques, and procedures
MWSS	Marine wing support squadron

N

NAS	National Airspace System
NATOPS	Naval Air Training and Operating Procedures Standardization
NAVAIDS	navigational aids
NAVAIR	Naval Air Systems Command
NAVFAC	Naval Facilities Engineering Command
NCF	Naval Construction Forces
NCO	noncommissioned officer
NEO	noncombatant evacuation operation
NGO	nongovernmental organization

nm	nautical mile
NMBC	Naval Mobile Construction Battalion
NTTP	Navy tactics, techniques, and procedures
NWDC	Navy Warfare Development Command
	O
OPCON	operational control
OPT	operational planning team
	P
PACAF	Pacific Air Forces
PAR	precision approach radar
POC	point of contact
POD	port of debarkation
Prime BEEF	prime base engineer emergency force
	Q
QRF	quick reaction force
	R
RDT	rapid deployment team
RED HORSE	rapid engineer deployable heavy operational repair squadron engineer
RPOE	rapid port opening element
RW	rotary-wing
	S
SAA	senior airfield authority
SF	security force
SITREP	situation report
SME	subject matter expert
SOF	special operations force
SOFA	status-of-forces-agreement
SPINS	special instructions
STS	special tactics squadron
STT	special tactics team
	T
TACON	tactical control
TACT	tactical aviation control team

TAGGS	Terminal Aeronautical GNSS Geodetic Survey
TAOG	theater airfield operations groups
TERPS	terminal instrument procedures
TM	technical manual
TRADOC	United States Army Training and Doctrine Command
TTP	tactics, techniques, and procedures

U

UAS	unmanned aircraft system
UFC	Unified Facilities Criteria
US	United States
USA	United States Army
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USAFE	United States Air Forces in Europe
USMC	United States Marine Corps
USN	United States Navy
USTRANSCOM	United States Transportation Command
UXO	unexploded explosive ordnance

V, W

VFR	visual flight rules

X, Y, Z

ZAR	zone availability report

PART II – TERMS AND DEFINITIONS

aerial port—An airfield that has been designated for the sustained air movement of personnel and materiel as well as an authorized port for entrance into, or departure from, the country where located. See also port of debarkation; port of embarkation. (*DOD Dictionary of Military and Associated Terms*. Source: JP 3-17)

airfield—An area prepared for the accommodation (including any buildings, installations, and equipment), landing, and takeoff of aircraft. See also departure airfield; landing area; landing site. (*DOD Dictionary of Military and Associated Terms*. Source: JP 3-17)

air base commander—The air base commander reports directly to the site commander and is responsible for providing air base and airfield support at the site. The air base commander will normally be a Marine wing support squadron commanding officer or a detachment officer-in-charge, depending upon the level of support that is required at the site. To support initial planning requirements, the air base

commander should participate in the advanced planning trips and support coordinating: airfield support, real estate management, other air base support with the staffs of the host nation air base commanders, and elements of the Marine air control group detachment, specifically air traffic control. (MCTP 3-20F.3)

air facility—An air facility is a secure airfield capable of supporting squadron-sized elements and providing organizational maintenance activity support. The facility sustains operations at a combat sortie rate and supports staging and replenishment of forward sites (e.g., forward arming and refueling points). Normally, an air facility does not perform major maintenance functions. An air facility stages aviation ordnance. Rough terrain-capable support equipment move and maintain aircraft and load ordnance. An air facility can be an airfield, road segment, matted runway (i.e., expeditionary airfield), or clear, level ground. The aviation combat element will usually employ a site commander at an air facility. (MCRP 3-20F.3)

air point—Air point design supports specific tactical missions at predetermined geographical locations. Air points are further broken down into forward arming and refueling points or lager points. (MCRP 3-20F.3)

air site—An air site is a secure location where aircraft preposition to reduce response time. The site is suitable for fully loaded and armed aircraft to land and await preplanned or immediate missions. Operations are limited to receiving and launching previously loaded aircraft. An air site may stage fuel and ordnance, but the site does not receive routine logistic support and contains minimum personnel. Operational requirements determine air site capability. Upon completion of a mission, aircraft must return to either a main base or air facility for refueling, weapons loading, and maintenance. (MCRP 3-20F.3)

base cluster—In base defense operations, [it is] a collection of bases, geographically grouped for mutual protection and ease of command and control. (*DOD Dictionary of Military and Associated Terms.* Source: JP 3-10)

base cluster commander—In base defense operations, a senior base commander designated by the joint force commander responsible for coordinating the defense of bases within the base cluster and for integrating defense plans of bases into a base cluster defense plan. (*DOD Dictionary of Military and Associated Terms.* Source: JP 3-10)

datum (geodetic)—A reference surface consisting of five quantities: the latitude and longitude of an initial point, the azimuth of a line from that point, and the parameters of the reference ellipsoid. World Geodetic System (WGS) 84 is the official DOD positional reference system. (JP 2-03)

forward arming and refueling point—A temporary facility, organized, equipped, and deployed to provide fuel and ammunition necessary for the employment of aviation maneuver units in combat. Also called FARP. (*DOD Dictionary of Military and Associated Terms.* Source: JP 3-09.3)

forward operating base—An airfield used to support tactical operations without establishing full support facilities. Also called FOB. (*DOD Dictionary of Military and Associated Terms.* Source: JP 3-09.3)

landing area—1. That part of the operational area within which are conducted the landing operations of an amphibious force. It includes the beach, the approaches to the beach, the transport areas, the fire support areas, the airspace above it, and the land included in the advance inland to the initial objective. 2. (Airborne) The general area used for landing troops and materiel either by airdrop or air landing. This area includes one or more drop zones or landing strips. 3. Any specially prepared or selected surface of land, water, or deck designated or used for takeoff and landing of aircraft. See also airfield; amphibious force; landing beach; landing force. (*DOD Dictionary of Military and Associated Terms.* Source: JP 3-02)

landing site—A site within a landing zone containing one or more landing points. See also airfield. 2. In amphibious operations, a continuous segment of coastline over which troops, equipment, and supplies can be landed by surface means. (*DOD Dictionary of Military and Associated Terms.* Source: JP 3-02)

landing zone—Any specified zone used for the landing of aircraft. Also called LZ. See also airfield. (*DOD Dictionary of Military and Associated Terms.* Source: JP 3-17)

main air base—A main air base is a secure airfield capable of supporting sustained operations ashore. The base can handle aircraft up to, and including, C-5B and C-17. Task organization requirements determine support agencies and required facilities. At a minimum, the main air base includes an intermediate maintenance activity support and full ground, logistic, and engineering functions required to support current and future needs. (MCRP 3-20F.3)

senior airfield authority—An individual designated by the joint force commander to be responsible for the control, operation, and maintenance of an airfield to include the runways, associated taxiways, parking ramps, land, and facilities whose proximity directly affects airfield operations. Also called SAA. (*DOD Dictionary of Military and Associated Terms.* Source: JP 3-17)

site commander—A group or squadron commanding officer or detachment officer in charge designated by the aviation combat element commander directly accountable to the aviation combat element commander for everything that takes place within the (air) base. The site commander's authority and responsibilities are not restricted to rear area operations but include all operational functions supporting the base, including force closure and deployment to and from the site, and [the site commander] must be intimately involved in the detailed planning of all units to ensure the commander's assigned mission timelines are met. The JFC also may designate a site commander as the SAA. (MCRP 3-20F.3)

***ATP 3-17.2**
MCRP 3-20B.1 [3-21.1B]
NTTP 3-02.18
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