UNITED STATES AIR FORCE MARITIME PRE-POSITIONING OF WAR RESERVE MATERIAL AND JOINT RECEPTION, STAGING, ONWARD MOVEMENT, AND INTEGRATION

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ABSTRACT

UNITED STATES AIR FORCE MARITIME PRE-POSITIONING OF WAR RESERVE MATERIAL AND JOINT RECEPTION, STAGING, ONWARD MOVEMENT, AND INTEGRATION, by MAJ Rodney M. Mason, USAF, 90 pages.

Beginning in 1989, the world saw the fall of the Berlin Wall, the end of the Cold War, and the signing of the Intermediate-Range Nuclear Forces (INF) Treaty. All of these events changed the military strategy from containment of a single threat to a strategy of power projection and global engagement. At the same time, the US has become the sole military superpower on the world stage. With the increase in destabilizing conflicts around the world, the military has become more involved as a political instrument in world affairs. All of these factors--a reduced forward presence, sole superpower status leading to international expectations and increased number of conflicts--give credence to the need for a responsive force using strategic mobility.

The purpose of this thesis is to determine the implications of the USAF proposal to use maritime pre-positioning of WRM as a means to significantly enhance agile combat support for future Expeditionary Aerospace operations. It starts with an explanation of the evolution of WRM forward basing and how the US went from a logistics mass in Europe during the Cold War to a mobile force depending on responsive logistics after the early 1990s. This thesis evaluates joint, Army and Air Force doctrine to define the process of deploying using maritime pre-positioning. This paper also focuses primarily on the joint reception, staging, onward movement, and integration (JRSOI) aspect of the maritime pre-positioning operation.

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LIST OF ACRONYMS

ACSA	Acquisition and Cross Service Agreements
ADVON	Advance Echelon
AEF	Aerospace Expeditionary Force
AEW	Aerospace Expeditionary Wing
AFDD	Air Force Doctrine Document
AFLMA	Air Force Logistics Management Agency
AMC	Air Mobility Command
APF	Afloat Pre-Positioning
APOD	Aerial Port of Debarkation
BSP	Base Support Plan
CINC	Commander In Chief
CPM	Critical Path Method
COB	Collocated Operating Base
CONUS	Continental United States
DLA	Defense Logistics Agency
DoD	Department of Defense
FM	Field Manual
FOL	Forward Operating Location
ITV	In-Transit Visibility
JLOTS	Joint Logistics Over-The-Shore
JMC	Joint Movement Center
JP	Joint Publication

JRSOI	Joint Reception, Staging, Onward Movement, And Integration
LMSR	Large Medium Speed Roll-On/Roll-Off
LOC	Line of Communication
LOTS	Logistics Over-The-Shore
LPS	Logistics Pre-Positioning Ships
MAJCOM	Major Command
MPP	Maritime Pre-Positioning
MPS	Maritime Pre-Positioning Ships
MRS	Mobility Requirements Study
MRSBURU	Mobility Requirements Study Bottom-up-Review Update
MSC	Military Sealift Command
NATO	North Atlantic Treaty Organization
POD	Port of Debarkation
RO/RO	Roll-on/Roll-off
RSOI	Reception, Staging, Onward Movement, And Integration
SA	Staging Area
SPOD	Sealift Port of Debarkation
TAA	Tactical Assembly Area
TALCE	Tanker/Airlift Control Element
TPFDD	Time-Phased Force Deployment Data
US	United States
USAF	United States Air Force
WRM	War Reserve Material

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CHAPTER 1

INTRODUCTION

Background

During the Cold War the United States (US) military strategy was one of containment with the focus on stopping Soviet forces and building a wall against communism. To build this wall, the US had a large number of equipment and personnel forward based in Europe. The military also had mobilization plans to rapidly deploy additional forces to support their in-place forces. In order to rapidly deploy the required forces into theater in time to halt the Soviets, military planners knew that they would have to pre-position war fighting stocks to compensate for the limited lift capability. To stockpile the required war reserve material (WRM), the US Air Force (USAF) established numerous collocated operating bases (COBs). These COBs were stockpiled with equipment and munitions to provide a reception base to support deploying forces into Europe. With containment as the sole focus, maintaining the ability to rapidly respond was straightforward.

The world changed in 1989 with the fall of the Berlin Wall, the end of the Cold War, and the signing of the Intermediate-Range Nuclear Forces Treaty. All these events contributed to the change in military strategy from one of containment, with relatively fixed borders, to one of power projection into unstable areas.[1] The transition from containment to power projection and budget cutbacks reduced the requirement for numerous COBs, but it did not remove the requirement to forward pre-positioned WRM to aid in power projection. To reduce costs and still provide pre-positioned WRM, the military closed a large majority of the COBs and centralized most of the WRM stocks

into regional depots. The regional depots would still allow forces to deploy using WRM, but it requires the use of airlift, rail, or road movement to place the WRM at the forward base.

At the same time, the US had become the sole military superpower on the world stage. Other countries expected the US to protect them from aggression and control or put down the threat from rouge states. The US obliged these countries. With the increase in destabilizing conflicts around the world, the military became more involved as a political instrument in world affairs. All of these factors--a reduced forward presence, sole superpower status leading to international expectations, and increased number of conflicts--gave credence to the need for a responsive force using strategic mobility.

In order to become more responsive, the military looked at reducing the amount of tools, equipment, and personnel needed to maintain weapon systems. The services are researching new technologies to make weapon systems more reliable, support equipment smaller, and test equipment compatible with multiple weapon systems to reduce the deployment footprint. However, no matter how modernized the military becomes it must maintain the capability to move assets forward to the crisis. The 1999 *National Security Strategy* states, "Transformation extends well beyond the acquisition of new military systems--we seek to leverage technological, doctrine, operational and organizational innovations to give US forces greater capabilities and flexibility."[2] One of the operational innovations that the Services developed to meet the need for more rapid deployment is the forward basing of WRM assets aboard maritime pre-positioned ships. Since the military is responding to numerous parts of the world and where the next war and or contingency will be cannot be predicted, setting up forward bases in numerous

countries and or regions around the world could make the military less responsive to areas without the forward basing and is cost prohibitive. So to overcome logistic shortfalls in a cost-effective manner, the different services have researched and implemented the use of maritime pre-positioning (MPP) of WRM. This method of pre-positioning provides a flexible response platform to stage assets in any region of the world as needed to meet a crisis and as a show of force.

Summary

The purpose of this thesis is to evaluate the USAF proposal to use MPP of WRM as a means to significantly enhance agile combat support for future expeditionary aerospace operations.[3] This paper will focus on the joint reception, staging, onward movement, and integration (JRSOI) aspect of MPP operations. The focus on JRSOI highlights the logistics planning and inter-service coordination that must take place to effectively use MPP.

Chapter 2 explains how the services evolved the use of MPP assets to meet their rapid response goals. This chapter also provides insight into the doctrine that governs JRSOI. The review starts with the US Army doctrine and how the Army developed RSOI. In 1999 the US Army released its RSOI doctrine. They are also the lead agent for development of the corresponding joint doctrine. This author will evaluate joint doctrine and provide a quick explanation of JRSOI. Lastly, USAF doctrine, to include the Air Force's core competencies of rapid global mobility and agile combat support will be examined.

Chapter 3 provides an explanation of the process used to perform the analysis of the USAF deployment methods. The methodology used to define the process focuses on

a critical path method of analysis. Using data from joint publications, Air Force instructions, and Army field manuals, the critical paths for the USAF's current method of deployment and for deployment using MPP will be examined. Development of the two paths will identify the critical events and their impact on the deployment process, whether positive or negative.

Chapter 4 lays out the current process the USAF uses to deploy forces to a bare-base location using airlift and land-based, pre-positioned WRM. The JRSOI process and the stages needed to accomplish a successful deployment are explained. The changes required in the USAF deployment path due to the use of MPP and the effects of USAF MPP on the Air Force and Army deployment process will be analyzed. Lastly, the effects of USAF MPP on the capabilities of the combatant commander are examined.

Chapter 5 draws conclusions, recommends areas for further research, and recommends changes to USAF doctrine to support their use of MPP. Areas for further research are suggested. Recommendations to develop USAF doctrine concerning MPP and to include MPP considerations into the commander and chief's (CINC's) theater engagement strategy will also be made.

Research Question

The primary research question for this thesis is: What are the implications of USAF plans to use maritime pre-positioned WRM to support the deployment and sustainment of a combat effective Air Expeditionary Wing (AEW)?

The secondary questions that need to be answered are:

1. What are the challenges involved in deploying an AEW using maritime pre-positioned equipment? To fully answer this question, the USAF's current method of

deployment, how MPP was different from how the USAF deploys now, and the effect on the USAF's deployment process was researched.

2. How will increased demands for pre-positioned assets effect the plans of other component commands and of the supported commander? To be more specific, the thesis will research the effect on the US Army deployment process and the responsiveness of MPP to the combatant commander.

Definitions

Aerospace Expeditionary Force (AEF). An organizational structure composed of force packages of capabilities, tailored to meet specific needs, providing war-fighting CINCs with rapid and responsive aerospace power. These force packages will deploy within an Aerospace Expeditionary Task Force as AEWs, aerospace expeditionary groups, or aerospace expeditionary squadrons. An AEF, by itself, is not a deployable or employable entity because it does not own the airlift for intertheater movement.[4]

Afloat Pre-positioning Operations. Pre-positioning of ships, preloaded with housekeeping, deployable industrial facilities, flight line support assets, vehicles, and supplies (including ammunition and petroleum) that provides for an alternative to land-based programs.[5]

Acquisition and Cross Service Agreements (ACSA). ACSA are bilateral agreements with foreign governments to acquire or transfer military logistics support, supplies, and services on a reciprocal basis.[6]

Agile Combat Support : An Air Force core competency which encompasses the process of creating, sustaining, and protecting all aerospace capabilities to accomplish mission objectives across the spectrum of operations.[7]

Area of Operations. An operational area defined by the joint force commander for land and naval forces. Areas of operation do not typically encompass the entire operational area of the joint force commander, but should be large enough for component commanders to accomplish their missions and protect their forces.[8]

Bare Base. A site with a usable runway, taxiway, parking areas, and a source of water that can be made potable.[9]

Base Development. The acquisition, development, expansion, improvement, and construction and or replacement of the facilities and resources of an area or location to support forces employed in military operations or deployed in accordance with strategic plans.[10]

Base Support Plan (BSP). The base-level planning accomplished to support combatant commands wartime operation planning, as well as MAJCOM supporting plans. A cross-functional consolidated view of base missions, requirements, capabilities, and limitations to plan for actions and resources supporting war and contingency operations, including deployments, postdeployment, and employment activities.[11]

C-Day. An unnamed day on which a deployment operation commences or is to commence. The deployment may be movement of troops, cargo, weapon systems, or a combination of these elements utilizing any or all types of transport.[12]

Causeway. A craft similar in design to a barge, but longer and narrower, designed to assist in the discharge and transport of cargo from vessels.[13]

Collocated Operations Base (COB). A base, usually owned and operated by an ally, that contains an active or reserve airfield designated for joint or unilateral use by

USAF wartime augmentation forces or for wartime relocation of USAF in-theater forces. COBs are not US bases.[14]

Contingency. An emergency involving military forces caused by national disaster, terrorists, subversives, or by required military operations.[15]

Core Competency. The basic areas of expertise or the specialties that the Air Force brings to any activity across the spectrum of military operations whether as a single service or in conjunction with the core competencies of other services in joint operations.[16]

Cross-Service Logistics. The process of one US military service providing dedicated logistic support for another.[17]

Deployment. The relocation of forces and material to desired areas of operations. Deployment encompasses all activities from origin or home station through destination, specifically including intracontinental United States, intertheater, and intratheater movement legs, staging, and holding areas.[18]

Expeditionary Force. An armed force organized to accomplish a specific objective in a foreign country.[19]

Facility. A real property entity consisting of one or more of the following: a building, a structure, a utility system, pavement, and underlying land.[20]

Fixed Port. World-class water terminals with a network of cargo-handling facilities capable of handling all types of oceangoing freight (that is containerized cargo, roll-on roll-off ships, and break bulk).[21] These facilities also have access to major highways, railroad, and airports to support the throughput of cargo.

Forward Operating Location (FOL). A base usually located in friendly territory or afloat, that is established to extend command and control or communications or support tactical operations.[22]

Harvest Eagle Package. An air transportable, tent-based system of housekeeping support facilities designed to provide basic living accommodations, field feeding, and hygiene support for personnel under bare-base conditions. Mobile aircraft arresting systems and contingency airfield emergency lighting systems are also included.[23]

Harvest Falcon Package. An air transportable system of hard-wall shelters, tents, equipment, and vehicles designed for worldwide support of personnel and aircraft under bare-base conditions.[24]

Host Nation. A nation, which receives the forces and or supplies of allied nations and or North Atlantic Treaty Organization (NATO) organizations to be located on, to operate in, or to transit through its territory.[25]

Host Nation Support. Civil and or military assistance rendered by a nation to foreign forces within its territory during peacetime, times of crisis, emergencies, or war based upon agreements mutually concluded between nations.[26]

Integration. In force projection, the synchronized transfer of units into an operational commander's force prior to mission execution.[27]

Intertheater Airlift. Airlift that operates between the continental United States and a theater or between theaters (formerly called strategic airlift).[28] Aircraft that normally perform intertheater lift are: C-5 Galaxy, C-17 Globemaster, and C-141 Starlifter. US Transportation Command and Military Airlift Command control intertheater lift assets.

Intratheater Airlift. The common-user air transportation and delivery of personnel and equipment within a CINC's area of responsibility (formerly called theater airlift).[29] Aircraft that normally performs intertheater lift is the C-130 Hercules. The C-5 Galaxy, C-17 Globemaster, and C-141 Starlifter can be used for intratheater airlift; but they must first be released by US Transportation Command to the theater CINC prior to fulfilling this mission. The theater CINC controls all intratheater airlift operations.

In-Transit Visibility. The ability to track the identity, status, and location of Department of Defense (DoD) units, and nonunit cargo (excluding bulk petroleum, oils, and lubricants), and passengers; medical patients; and personal property from origin to consignee or destination across the range of military operations.[30]

Joint Logistics Over-the-Shore (JLOTS). Operations in which Navy and Army LOTS forces conduct LOTS operations together under a Joint Force Commander.[31]

Line of Communications (LOC). Routes either land, water, and or air which connects an operating military force with a base of operations and along which supplies and military forces move.[32]

Logistics Over-The-Shore (LOTS). Process of discharging cargo from vessels anchored offshore or in-the-stream, transporting it to the shore and or pier on barges, and marshalling it for movement inland.[33]

Marshalling Area. Location in the vicinity of a reception terminal or pre-positioned equipment storage site where arriving unit personnel, equipment, materiel, and accompanying supplies are reassembled, returned to the control of the unit commander, and prepared for onward movement.[34]

Mutual Support. That support which units render each other against an enemy, because of their assigned tasks, their position relative to each other and to the enemy, and their inherent capabilities.[35]

Node. A location in a mobility system where a movement requirement originates, is processed for onward movement, or terminates.[36]

Onward Movement. The relocation of forces capable of meeting commander's operational requirements to the initial point of their mission execution. This includes the movement of associated sustainment, equipment, and personnel.[37]

Port of Debarkation (POD). The geographic point at which cargo or personnel are discharged. May be a seaport or aerial port of debarkation. For unit requirements, it may or may not coincide with the destination.[38]

Port of Embarkation. The geographic point in a routing scheme from which cargo or personnel depart. May be a seaport or aerial port from which personnel and equipment flow to port of debarkation. For unit and nonunit requirements, it may or may not coincide with the origin.[39]

Prime Base Engineer Emergency Forces. A Headquarters USAF, major command (MAJCOM), and base-level program that develops and maintains a highly skilled, agile military combat support civil engineer force capable of rapid responses in support of worldwide contingency operations. It assigns civilian employees and military personnel to both peacetime real property maintenance and wartime engineering functions.[40]

Prime Readiness in Base Services. A Headquarters USAF, MAJCOM, and base-level mobility program that organizes and trains USAF military forces for wartime and peacetime contingency support roles worldwide.[41]

Reachback. The process of obtaining products, services, and applications, or forces, equipment, or materiel from Air Force organizations that are not forward deployed.[42]

Reception. The process of receiving, offloading, marshalling, and transporting of personnel, equipment, and material from the strategic and or intratheater deployment phase to a sea, air, or surface transportation point of debarkation to the marshalling area.[43]

Seaport of Debarkation. The geographic point in theater at which strategic sealift is offloaded.[44]

Staging. The assembling, holding, and organizing of arriving personnel, equipment, and sustainment material in preparation for their onward movement to the operational area.[45]

Tactical Assembly Area (TAA). An area that is generally out of the reach of light artillery and the location where units make final preparation (precombat checks and inspections) and rest, prior to moving to the line of departure.[46]

Tanker Airlift Control Elements (TALCEs). A mobile command and control organization deployed to support strategic and theater air mobility operations at fixed, en route, and deployed locations where air mobility operational support is nonexistent or insufficient. The TALCE provides on-site management of air mobility, airfield operations to include command and control, communications, aerial port services,

maintenance, security, transportation, weather, intelligence, and other support functions, as necessary.[47]

Throughput. The average movement of containers, wheeled vehicles, tracked vehicles, break bulk cargo, and bulk liquid cargo that can pass through a port or beach daily, from the discharge from a ship or plane to the exit (clearance) from the port complex.[48]

Time-Phased Force and Deployment Data (TPFDD). The Joint Operation Planning and Execution System data base portion of an operation plan; it contains time-phased force data, nonunit-related cargo and personnel data, and movement data for the operation plan, including: (1) in-place units; (2) units to be deployed to support the operation plan with a priority indicating the desired sequence for their arrival at the port of debarkation; (3) routing of forces to be deployed; (4) movement data associated with deploying forces; (5) estimates of nonunit-related cargo and personnel movements to be conducted concurrently with the deployment of forces; and (6) estimate of transportation requirements that must be fulfilled by common-user lift resources as well as those requirements that can be fulfilled by assigned or attached transportation resources.[49]

War Reserve Material (WRM). Material (AMMO, fuel, meals ready to eat, and Harvest Falcon or Eagle kits) required in addition to primary operating stocks and mobility equipment to attain the operational objectives in the scenarios authorized for sustainability planning in the defense planning guidance.[50]

Assumptions

The US will maintain its superpower position in the world. Other countries will continue to look to the US military to respond to hot spots around the globe. Military forces will

have to deploy around the globe because forward basing will remain limited. As hot spots erupt, the political process may delay decisions to deploy military forces, so the response time line for deployment will continue to shrink. Intertheater airlift capacity will not appreciably increase. Transformation of the fighting force will not appreciably lower its deployment airlift requirements. As technology improves capability and survivability as well as the characteristics of weapon systems, the response time line for all the services will decrease and require faster responses. The leaner, faster, lighter response requirements that the USAF and US Army are developing will place a greater emphasis on the utilization of airlift during initial response. Their maritime pre-positioned assets will also arrive in the port simultaneously creating an overwhelming workload for ground logistics operations.

Limitations

As the Berlin Wall fell, symbolizing the end of the Cold War, so did many barricades to the flow of information. The increased flow of information has made it less predictable to determine where the military will respond next. This flow of information has enabled factions (such as Kurds, Serbs, and Albanians) to be more educated about their enemies and allowed the public to see and sympathize with their sufferings. The ability for the public to get involved has played a key role in the politicians' ability or inability to control which crisis they respond to and when. The inability to predict the next theater or country that requires a military response is a key limitation on this study. With the constraints given to accomplish this thesis, the time is not available to research each region of the world and look at the infrastructure advantages or shortfalls of each country.

To truly evaluate the effects of USAF MPP on the services, deployment process and the infrastructure capabilities of different countries extensive modeling and war gaming of different scenarios need to be accomplished. Some data was able to be obtained to be analyzed by the Air Force Logistics Management Agency (AFLMA). However, the scenarios evaluated by the AFLMA focused mainly from the deployment start date or C-Day to the arrival of the vessel at the port of debarkation (POD). Due to the limited time, monetary resources, equipment availability, limited access to the different services classified war plans, and lack of proper training to perform modeling or war-gaming scenarios this thesis will not evaluate specific operations plans.

A final limitation on this thesis is the limited diversity of material to draw from for analysis as well as varying points of view. Even though the US Marines have been using pre-position afloat since the late 1980s and the US Army has been building its pre-positioning fleet since the mid-1990s, very little research has been accomplished in the area of JRSOI. The main publications that are available for research are the US Army field manual on RSOI and Joint Publication (JP) 4-01.8, *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration*, published in June 2000.

Delimitations

Money will be a critical factor in accomplishing MPP. The defense budget is already stretched thin maintaining aging weapon systems, developing more modern systems, and working to retain the best-qualified officers and enlisted. There have been some preliminary budget numbers proposed for MPP. However, the acquisition or sustainment costs of MPP will not be discussed in this paper.

Extensive planning is also required to determine what to store on the MPP vessel. The USAF's planning process is quite thorough when developing BSPs and determining what assets to pre-position as WRM at specific locations. To determine what assets need to be stored on a vessel as WRM afloat would require in-depth knowledge of what type and how many aircraft could be stationed within the theater and supported by the pre-position afloat assets. Futhermore, the location and capabilities of the chosen basing locations within a theater would effect asset requirements. Any of this information could be classified or when combined is classified. In order to keep this thesis at the operational and strategic level, comply with the time restraints, and remain unclassified, this thesis does not evaluate the quantity and make-up of the WRM stored on the vessel.

Once the WRM is on the vessel for storage how to get it into theater becomes one of the main issues. A contingency environment can have one of two entries--opposed and unopposed. In opposed operations, the configuration of units is tactical, and they are under command and control of the force commander, from origin to destination. These units must have sufficient combat capability to fight immediately upon arrival in theater. However, in the unopposed deployment, personnel and equipment can take separate forms of transportation and rejoin upon arrival in theater.[51] While researching and analyzing this thesis, the focus will remain on the unopposed entry into a theater.

The US Marines are one of the leaders in executing an operational tasking using pre-position afloat assets. The Marines were the first of the services to establish a pre-position afloat fleet in the late 1980s. This fleet consists of three squadrons and operates in the Mediterranean, Indian Ocean, and Guam. These squadrons are self-sufficient and can operate autonomously from the other services. Based on their autonomy and minimal

interaction at the port with the US Army and USAF, this thesis will not analyze the effects of the USAF pre-position afloat proposal on the US Marines.

The Marines developed a maritime pre-positioning capability in the late 1980s. However, the capability to deploy WRM around the globe by ship or airlift has been around since the 1950s. Chapter 2 will look at the development of the WRM pre-positioning and maritime pre-positioning processes as well as the governing doctrine. [52]

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[1]David N. Doyle, *The Wartime Utility of Pre-positioned Material* (Newport, RI: Naval War College, 6 March 1996), 2.

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[3]Captain Paul Boley, "Afloat Pre-positioning for Non-munitions WRM," (Research project AFLMA PROJECT LX200001300 presented to General Zettler, USAF/IL by the Air Force Logistics Management Agency).

[4]Department of the Air Force, Air Force Doctrine Document 2-0, *Organization And Employment Of Aerospace Power* (Washington, DC: Defense Printing Office, 17 February 2000), 133 (hereafter cited as AFDD 2-0).

[5]United States Transportation Command, Joint Publication 4-01.6, *Joint Tactics, Techniques, and Procedures for Joint Logistics Over-The-Shore (JLOTS)* (Washington, DC: Defense Printing Office, 12 November 1998), GL-5 (hereafter cited as JP 4-01.6).

[6]Department of the Air Force, Air Force Doctrine Document 2-4.4, *Bases, Infrastructure, and Facilities* (Washington, DC: Defense Printing Office, 13 November 1999), 53 (hereafter cited as AFDD 2-4.4).

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[9]Ibid., 6.

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[11]Ibid.

[12]Department of the Air Force, Air Force Instruction 25-101, *War Reserve Materiel (WRM) Program Guidance And Procedures* (Washington, DC: Defense Printing Office, 25 October 2000), 84 (hereafter cited as AFI 25-101).

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[14]AFDD 2-4.4, 54.

[15]Ibid., 55.

[16]Department of the Air Force, Air Force Doctrine Document 1, *Air Force Basic Doctrine* (Washington, DC: Defense Printing Office, September 1997), 80 (hereafter cited as AFDD 1).

[17]United States Transportation Command, Joint Publication 4-01.8, *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration* (Washington, DC: Defense Printing Office, 13 June 2000), III-12 (hereafter cited as JP 4-01.8).

[18]Ibid., GL-6.

[19]JP 4-01.6, GL-9.

[20]AFDD 2-4.4, 55.

[21]JP 4-01.8, GL-7.

[22]AFDD 2-4.4, 56.

[23]AFI 25-101, 85.

[24]Ibid.

[25]JP 4-01.8, GL-7.

[26]Ibid.

[27]JP 4-01.8, GL-8.

[28]AFDD 1, 82.

[29]Ibid.

[30]JP 4-01.8, GL-8.

[31]JP 4-01.6, GL-11.

[32]JP 4-01.8, GL-10.

[33]JP 4-01.6, GL-11.

[34]JP 4-01.8, GL-15.

[35]AFDD 2-4.4, 58.

[36]JP 4-01.8, GL-12.

[37]Ibid., GL-13.

[38]Ibid., GL-14.

[39]Ibid., GL-14.

[40]AFDD 2-4.4, 58.

[41]Ibid., 59.

[42]AFDD 2-0, 141.

[43]JP 4-01.8, GL-15.

[44]Ibid.

[45]Ibid.

[46]Ibid., GL-16.

[47]Department of the Air Force, Air Force Doctrine Document 2-6, *Air Mobility Operations* (Washington, DC: Defense Printing Office, 25 June 1999), 84.

[48]JP 4-01.8, GL-17.

[49]Ibid.

[50]AFDD 2-4.4, 59.

[51]Department of the Army, Field Manual 100-17-3, *Reception, Staging, Onward Movement, and Integration* (Washington, DC: Defense Printing Office, 17 March 1999), 1-7.
[52]

CHAPTER 2

LITERATURE REVIEW

Background

In the late 1980s and early 1990s, in response to the changing world environment brought about by the end of the Cold War, the US reduced defense spending and the size of the military. A major part of the downsizing occurred overseas; both forward deployed forces and forward pre-positioned WRM were reduced to bare bone levels. The USAF WRM that was pre-positioned in Europe consisted mainly of munitions, vehicles, aerospace ground equipment, and life sustainment supplies to support a rapid USAF buildup in Europe in the event of a confrontation with the Soviet Union in Europe. These WRMs were located at more than twenty-seven North Atlantic Treaty Organization (NATO) bases in Eastern Europe called COBs. Allies own and operate the COBs. They provide the US with an active or reserve airfield for joint or unilateral use by wartime augmentation forces or for wartime relocation of USAF in-theater forces.[1] Each location varies in accessibility, readiness, infrastructure, and support activities. COBs were set up so that air wings could deploy into them and have everything they needed to operate including facilities. The COBs reduced the amount of airlift required to deploy personnel and aircraft specific items, such as aircraft engines and specialized test and handling equipment, from continental United States to Europe. As part of the drawdown, Headquarters USAFs Europe directed the closure of over eighteen of these locations and the consolidation of some of the assets at strategically positioned depots for rapid movement, if needed.

With fewer US forces present overseas, US National Military Strategy was written with a heavy reliance on the fundamental concept of force projection, the military element of power projection. A key element of power projection is deployment.[2] Deployments of expeditionary aerospace forces that can mass quickly and move globally become critical to military operations.[3] To make the expeditionary force a viable deployment force in the twenty-first century, the USAF began to examine the capabilities of its deployable support packages. Since the 1950s, the USAF has built deployable support packages to assist in the deployment of forces. These initial deployment kits were nicknamed Gray Eagle. The kits were heavy, bulky, and required excessive time to position and erect. In the 1960s, modifications were accomplished to make the deployable kits more air transportable and the nickname changed to Harvest Eagle.

Harvest Eagle kits are designed for use in the European and Pacific theaters. They provide facilities for bare-base lodging, dining, industrial work, or for supporting additional requirements at an existing installation.[4] With the withdrawal of forward-positioned forces and the removal of strategically staged equipment and supplies, the USAF became more reliant on these Harvest kits to make them a rapidly deployable force.

In the 1980s, Central Air Force began to build a Harvest kit for its theater of operations and nicknamed it Harvest Falcon. The Harvest Falcon kits are designed for long duration (six months or longer) use in Southwest Asia. These deployment packages include tents, hard-wall shelters, vehicles, aerospace ground equipment, water purification and production equipment, kitchens, power-generating and distribution equipment, and airfield support equipment.[5] They have enough assets to support between

72 to 750 tactical and support aircraft and between 1,100 to 55,000 personnel at a bare-base location. Munitions are not included in these kits and are either already pre-positioned in country, airlifted in, or come from the USAF logistics pre-position ships. These Harvest Falcon packages are stored and maintained at Holloman Air Force Base in the CONUS, and contractors maintain the forward pre-positioned land-based locations. When support assets are required, airlift moves the properly tailored kit to the predetermined location for assembly to support the contingency.

The DESERT SHIELD buildup took the military six months to assemble all the forces (Army, Navy, Air Force, and Marines) needed to support Operation DESERT STORM. Prior to DESERT SHIELD August 1990, Central Air Force had put together around 82 percent of the first Harvest Falcon package. Around 35 percent of the assembled Harvest Falcon kit was in South West Asia, and the other 65 percent was being maintained in the CONUS.[6] This tailored, consolidated, ready-to-deploy package still required airlift to move it to its required destination.

To move the Harvest Falcon and Eagle packages C-5s and C-17s are used to move the outsized and oversized cargo, and C-130s are used for the remaining assets. This ties up valuable intertheater and intratheater airlift. The time required to prepare for DESERT STORM highlighted an overarching need for the military to become more responsive. The services have looked for ways to shorten deployment time lines to crises around the world.

One of the prevailing concepts to improve the responsiveness of the military is the use of pre-positioned sealift. Equipment pre-positioned afloat has universal utility for CINCs. It represents critical weapons systems, equipment, and supplies common to all

the theaters.[7] This concept is being used to varying extent by all the armed services and is managed by Military Sealift Command (MSC). MSC provides operationally ready ships to the military services and the Defense Logistics Agency (DLA) as part of the Afloat Pre-positioned Force (APF) (see figures 1 and 2). The APF is divided into three parts: Combat Pre-positioned Ships operated for the US Army; MPP Ships operated for the US Marine Corp; and Logistics Pre-positioning Ships (LPS) operated for the US Navy, Air Force, and DLA.[8] The Army's part of the APR was developed in response to the Pentagon 1992 Mobility Requirements Study (MRS) and the 1995 MRS Bottom-up-Review Update (MRS BURU). Under combat pre-positioned ships program, the Army has pre-positioned equipment and supplies needed to support two armor battalions and two mechanized battalions in a heavy brigade--up to 6,000 personnel--for up to fifteen days.[9] This fleet consists of sixteen ships and provides 2.0-million-square-feet of pre-positioning storage space.[10] Forward deployment of equipment on pre-position ships enables the Army to meet its desired deployment goals of a pre-positioned afloat armored combat brigade in theater by C-day plus fifteen days and five and one-third divisions by C-day plus seventy-five days.[11]

The second part of the APF is the MPP force that supports the US Marine Corps. This fleet of thirteen vessels was put together in the early 1980s to expedite deployment of Marine Expeditionary Forces. The vessels are divided up into three squadrons; each squadron operates in a different forward deployed location. Maritime pre-position ships (MPS) Squadron One has four ships and operates in the Mediterranean; MPS Squadron Two has five ships and operates in the Indian Ocean area at Diego Garcia; and MPS Squadron Three has four ships and operates in the Western Pacific near Guam and

Saipan.[12] One squadron of MPS carries enough equipment and supplies to sustain up to 17,600 Marines for thirty days of operations.

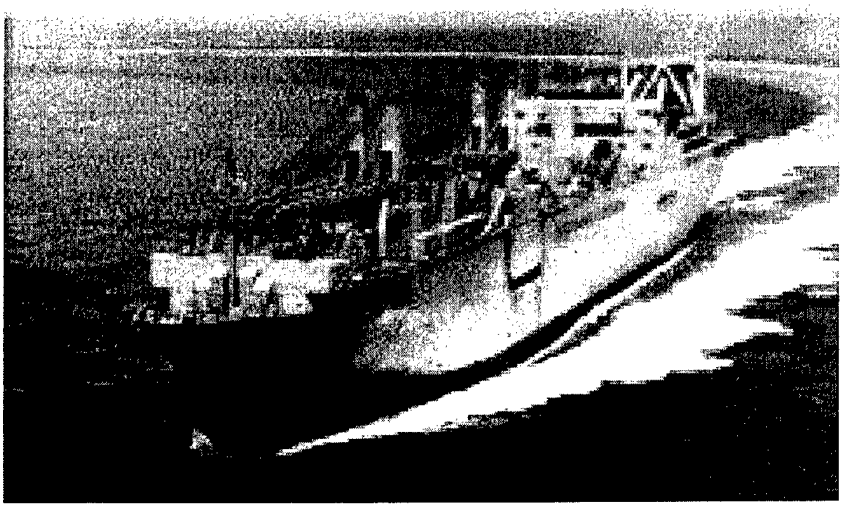

Figure 1. Roll-on Roll-off Ship. Source: Department of the Navy, "The United States Navy Fact File," *Large Medium-Speed Roll-on/Roll-off Ships-T-AKR*; available from http://www.chinfo.navy.mil.navpalib/factfile/ship-takr2.html; Internet; accessed 30 April 2001.

The third part of the APF is the LPS that support the US Navy, Air Force, and DLA. This fleet consists of nine vessels that support containerized, break bulk, and roll-on and roll-off capabilities. The Air Force has three LPS to carry various types of air-to-air and air-to-ground ammunition. Two of the USAF ships operate in the Indian Ocean and one is in the Mediterranean. One LPS carries Navy cargo and a 500-bed field hospital. Three ships of the logistics fleet carry over 600,000 barrels of aircraft fuel for the DLA mission. Two additional ships carry Marine aviation support cargo.[13]

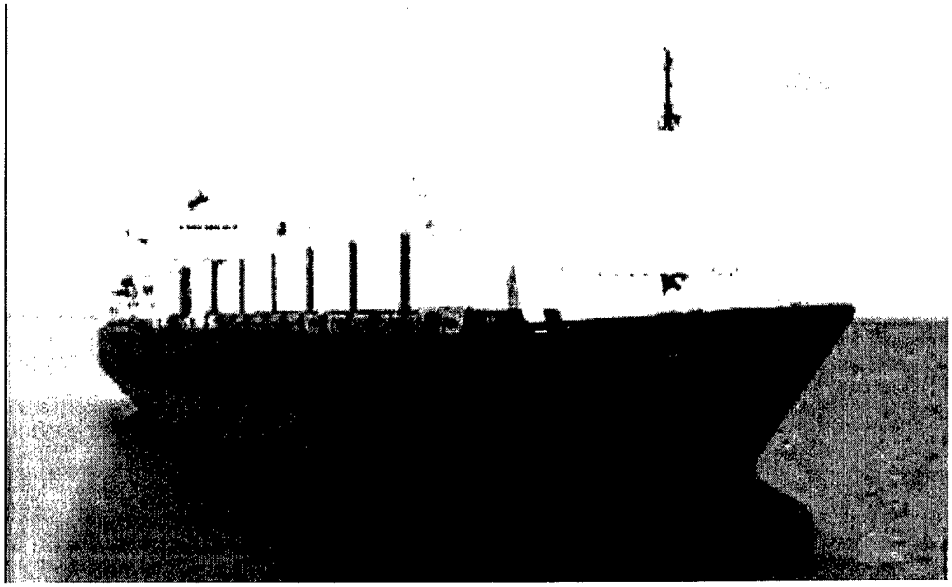

Figure 2. Logistics Pre-position Container Ship. Source Department of the Navy, "Pre-positioning," *The U.S. Navy Military Sealift Command 1999 in Review*; available from http://www.msc.navy.mil/1999inreview/pm3.htm; Internet; accessed 27 January 2001, 4 of 5.

The military continues to examine current deployment activities to improve efficiency. One of the possibilities the USAF has been examining to free up airlift and still meet requirements for deploying the AEW is MPP of Harvest Falcon kits. This thesis examines MPP of WRM with the focus more on the RSOI of the cargo to the air base. It will evaluate what effect pre-positioning afloat will have on the USAF's ability to rapidly deploy the AEW and on the other services deployment processes.

Research Sources

The thesis research started with a review of Army, Joint, and Air Force doctrine.

Army Doctrine

The Army in its 1993 edition of Field Manual (FM) 100-5, *Operations,* began to give definition to the concept of deploying CONUS-based forces.[14] The Army APF,

developed in response to the 1992 MRS and the 1995 MRS BURU, was a major change in how the Army deployed forces around the world. In 1996, the Army established the doctrinal framework for a major element of its initial force projection capability in FM 100-17-1, *Army Pre-Positioned Afloat Operations*.[15] FM 100-17-1 defines the process from the offload of the first ship or aircraft to when the last unit is linked up at the TAA as the fourth phase of Army Pre-Positioned Afloat operations or RSOI phase. With this regulation, the Army set the stage for the development of JRSOI doctrine.

Joint Doctrine

JP 4-01.8, *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration,* was published in June of 2000 and is the cornerstone doctrine for JRSOI operations, which sets the standard for all the service's RSOI procedures. Movement of forces and their sustainment is conducted in four phases: pre-deployment activities, movement to and activities at a port of embarkation, movement to a POD, and JRSOI.[16] JRSOI is the last step and an essential process that transitions forces from the POD into forces capable of performing their mission.

To understand the importance of JRSOI all four segments must be defined and analyzed. Reception operations are those operations required to receive cargo and personnel and clear them through the POD. Staging operations assemble, temporarily hold, and organize arriving troops, equipment, and materials into units. During this segment, in-country training takes place and units are prepared for onward movement. Onward movement is the process of moving units and accompanying material from staging and marshalling areas to the TAA. The synchronized handover of a unit to an operational command is the final segment called integration. All of these segments must

be choreographed and synchronized together by the combatant commanders theater-joint movement center, so that no one segment becomes bottlenecked causing delays in the deployment of forces.

The four segments of JRSOI are held together by the three overarching principles that assist commanders in successful deployment of forces. Unity of command is the first principle and like its name suggests, specifies that a single individual is responsible for the overall coordination of JRSOI activities. This individual is the supported combatant commander. The combatant commander controls the movement of forces within the area of responsibility, provides support to arriving forces, and centrally coordinates the efforts of all the key players in the JRSOI process. The second principle that ensures successful RSOI is synchronization. Synchronization links personnel, equipment, and material in a timely manner. This principle, well executed, expedites the buildup of mission capability and avoids saturation of nodes along the LOC. The key to synchronization is detailed joint planning ahead of time, timely and predictable airflow and seaflow, visibility of assets moving through the pipeline, and the ability to control the flow. The final principle is balance. Balance applies to managing the TPFDD to maintain a continuous flow. To enable the continuous flow the supported commander adjusts the movement schedule of units to meet the changes in mission requirements. Combine these principles together and integrate them into the four segments and JRSOI becomes a critical part of the deployment and ability to mass forces in a theater of operations. Figure 3 provides a graphic illustration of the relationship of the segments and principles to enhance the fielding of joint forces.

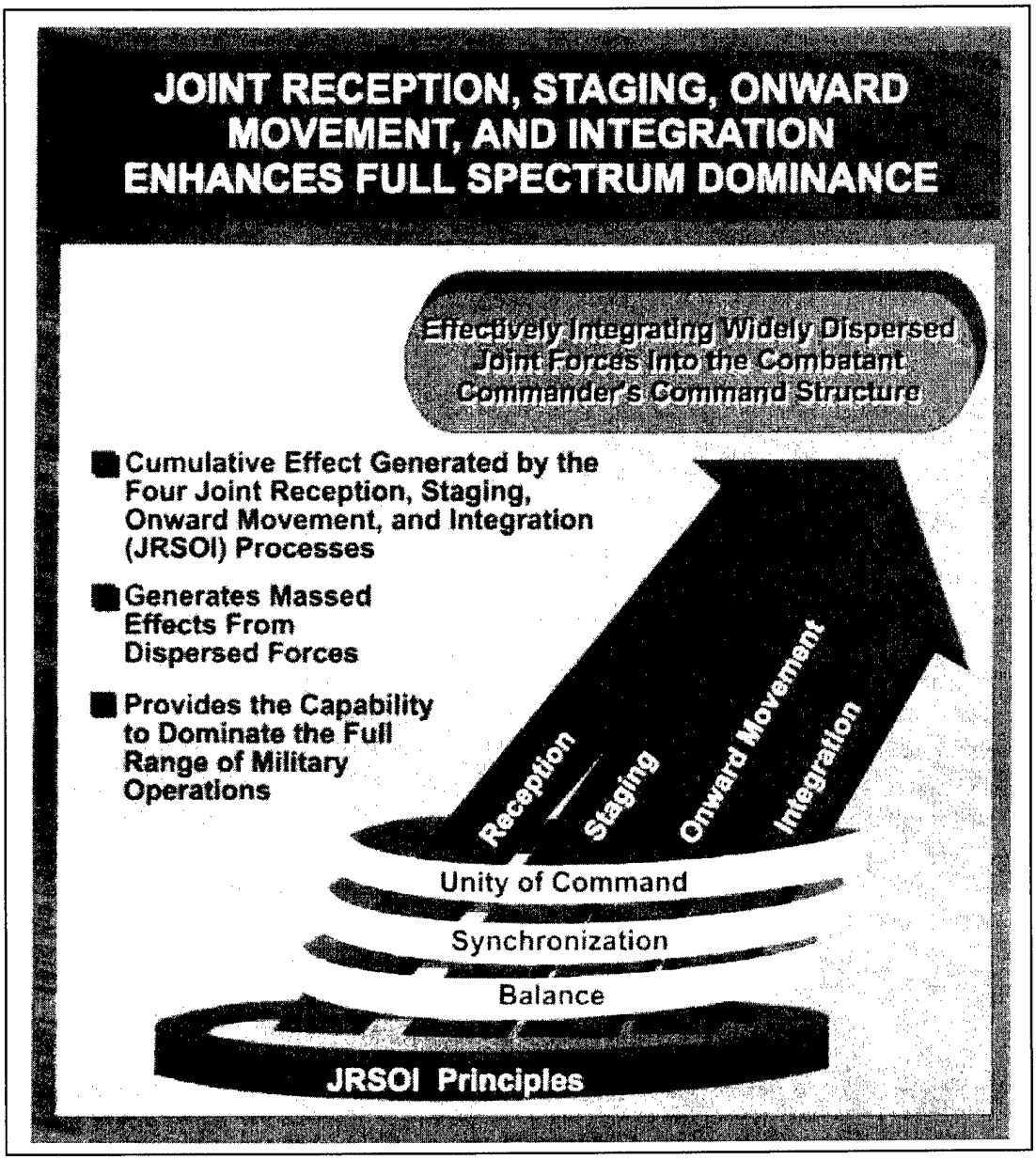

Figure 3. Source: Department of the Army (DAMO-FDQ), Joint Publication 4-01.8, *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration* (Washington, DC: US Government Printing Office 13 June 2000), I-2.

All services' doctrine must comply with joint doctrine. For that reason JP 4-01.8 will be the framework for this thesis and RSOI requirements for the Air Force maritime pre-positioned WRM.

Air Force Doctrine

The USAF's core competencies--found in Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*--of rapid global mobility and agile combat support bring together the Air Forces focus on the need to be flexible in its support capabilities and responsive in global airlift capabilities to respond to crises within hours of notification. Rapid global mobility, a unique USAF core competency, is key to maintaining global presence and a rapid response capability. The synergistic combination of airlift, air refueling, and air mobility support assets represents one of the greatest characteristics differentiating the USAF from the air arms of other services and the capabilities of other nations' air forces.[17]

AFDD 1 also highlights the use of pre-positioned WRM assets as a means to reduce the amount of strategic airlift needed. However, it also infers that they are land-based assets used in concert with host nation support to reduce the footprint needed to deploy. While staging assets reduces transportation requirements, the Air Force should maintain a balance between pre-positioning and the ability to deploy into areas where there is no staged material. Pre-positioned equipment afloat could be the answer to meet the need for WRM assets in remote areas.

Other Literature

The Center for Army Lessons Learned published newsletters in February 1997 and December 1999 clarifying the procedures for how the Army performs RSOI missions.

Using these newsletters and the doctrine manuals, FM 100-5 and FM 100-17-1, the Air Force can begin to understand the requirements for its plan to deploy WRM using pre-position ships.

Along with the field manuals and joint publications mentioned above, the Air Force research and briefings created by the AFLMA are primary sources of information for this paper. These documents provide an analysis of the types of equipment, vehicles, and other assets the USAF needs to pre-position to meet Department Planning Guidance requirements to wage war. They also perform a cost analysis of the savings incurred by using sealift versus airlift. Because the Air Force is still in the research stage, it needs to evaluate the JRSOI process as part of its feasibility study. When using pre-position ships, considering the JRSOI processes effects on the AEW deployment is critical to mission success.

After-action reports from the Gulf War, Bosnia, and Kosovo operations; Secretary of Defense Annual Reports to Congress; and the 1992 MRS provide justification for the use of pre-positioned afloat. They also provide insight into the value of sealift and pre-positioned afloat as critical pieces of the strategic mobility triad. As shown in figure 4 the strategic mobility triad consists of intertheater airlift, strategic sealift, and both land and maritime pre-positioned assets to enable strategic maneuver and global sustainment of US forces. As described earlier, the Gulf War unveiled the need for a faster deployment capability and pre-positioned war-fighting material to support conflicts in non-NATO countries. Bosnia demonstrated the success of sealift to support a more rapid deployment to a conflict and have the ability to mass forces upon arrival. On the other hand, ALLIED FORCE in Kosovo was a good example of the need to not neglect the

sealift arm of the mobility triad but to consider it in all conflicts. During ALLIED FORCE, sealift was not used to deploy forces. Each of these after-action reports shows the need for sealift and improvements in the logistics process to get assets ashore once the sealift arrives in theater.

Figure 4. Strategic Mobility Triad. Source: Department of the Army (DAMO-FDQ), Joint Publication 4-01.8, *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration* (Washington, DC: US Government Printing Office, 13 June 2000), I-3.

There was an adequate amount of reference and source material available to develop the analysis and conclusions produced in this thesis. The JRSOI research was conducted and coordinated with AFLMA, Central Air Force, and Central Command. Coordination of the thesis research and analysis was critical in order to obtain accurate data and to ensure conclusions and recommendations that this author developed are accurate and operationally feasible. This is some of the first research accomplished on the topic of RSOI involving USAF WRM. Further research using this thesis as the basis to develop the processes and procedures needs to be performed on RSOI issues.

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[1]Department of the Air Force, Air Force Doctrine Document 2-4.4, *Bases, Infrastructure, and Facilities* (Washington, DC: Defense Printing Office, 13 November 1999), 54.

[2]Department of the Army (DAMO-FDQ), Joint Publication 4-01.8, *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration* (Washington, DC: US Government Printing Office, 13 June 2000), vii (hereafter cited as JP 4-01.8).

[3]US Air Force Doctrine Center, Air Force Doctrine Document 1, *Air Force Basic Doctrine* (Washington, DC: Defense Printing Office, September 1997), 72 (hereafter cited as AFDD 1).

[4]Ibid., 9.

[5]Colonel George T. Raach, et al., *Conduct of the Persian Gulf War Final Report to Congress* (Washington, DC: Department of Defense, April 1992), 398.

[6]Ibid.

[7]Department of the Army, Field Manual 100-17-1, *Army Pre-Positioned Afloat Operations* (Washington, DC: U.S. Government Printing Office, 1996), 1-1.

[8]Department of the Navy, "Pre-positioning," *The U.S. Navy Military Sealift Command 1999 in Review* [Report on-line]; available from http://www.msc.navy.mil/1999inreview/pm3.htm; Internet; accessed 27 January 2001, 1 of 5.
[9]Ibid.

[10]Ibid.

[11]DALO-TSM, Information Paper, *Army Strategic Mobility Program (B-5-01)* [Report on line]; available from http://enterpriseconsultancy.cs.amedd.army.mil/ Library/Army_Top_Priorities/StratMobility_Pgm.html; Internet; accessed 26 January 2001, 1 of 3.

[12]Department of the Navy, "Pre-positioning," *U.S. Navy Military Sealift Command Fact Sheet* [Report on-line]; available from http://www.msc/navy. mil/PM3/apffs.htm; Internet; accessed 27 January 2001, 1

[13]Ibid.

[14]Department of the Army, FM 100-17-1, *Army Pre-Positioned Afloat Operations* (Washington, DC: U.S. Government Printing Office, 1996), i.

[15]Ibid., ii.

[16]JP 4-01.8, I-1.

[17]AFDD 1, 34.

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CHAPTER 3

METHODOLOGY

Background

The primary research question for this thesis asks, What are the implications of the USAF's plans to use maritime pre-positioned logistics assets to support the deployment and sustained combat effectiveness of an AEW? Rapid deployment of personnel and equipment is critical to the military's ability to meet the requirements of the National Security Strategy. Currently the Marine Corps has thirteen MPP ships divided into three squadrons located in the Mediterranean, Indian Ocean, and Western Pacific. Each squadron has enough equipment and supplies to support a Marine Corps Air-Ground Task Force of up to 17,600 Marines for thirty days.[1] The US Army has sixteen ships with their heavy brigade, combat support and combat service support units with thirty days of support capability. The USAF has three ships with munitions located in the Indian Ocean. In addition, there are six other ships with other logistics and medical support items on them. Together the different services MPP makes up the Defense Department's pre-positioned afloat response.[2]

Pre-positioned afloat vessels are the Army and Marine Corps means to rapidly deploy forces, but the USAF uses airlift and pre-positioned WRM. USAF current deployment process is self-contained and accomplished using organic airlift to transport rapid deployment kits from the CONUS and or land-based pre-positioned assets between theaters. The land-based pre-positioned assets are strategically positioned for use in a specific theater and require mobility teams to ready them for use and responsive airlift or ground transportation vehicles to move them to the FOL. Moving the WRM by surface

transportation or airlift in most theaters may be difficult due to route limitations, limited railroad systems, and availability of contract trucks. Movement by air consumes valuable intratheater and intertheater airlift sorties. Both method of movement of WRM require diplomatic clearance to transit across a nation's borders or airspace.

In June 1999 the AFLMA began looking at the possibilities of forward deploying Harvest Falcon WRM kits aboard pre-position ships. Under the MPP of WRM concept airlift requirements are reduced, more rapid deployment of the AEW is possible, and there is flexibility to the ever-changing world environment. This proposal would change the way that the USAF coordinates its deployment of forces into and out of a theater. When the USAF changes to the use of WRM pre-positioned afloat it will lose some of its independence. The USAF will require the support of other services to successful perform future combat and deployment operations. The MSC will be responsible for the management of pre-positions ships and their crews. According to JP 4-01.8, *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration,* the Army will have the responsibility for the reception, staging, and management of the onward movement of USAF assets. Integration of the supplies, equipment, and vehicles to create a base ready for the reception of forces will be the responsibility of the USAF. The thesis addresses the impacts of the USAF proposal to use pre-position ships to meet deployment requirements by evaluating the effects of this proposal on the ability of the services to accomplish their missions and support the combatant CINC.

Secondary Research Questions

The secondary thesis questions address two areas of concern when proposing a major change to how the USAF deploys AEWs. First, what are the challenges involved in deploying an AEW using maritime pre-positioned equipment? Key areas to be researched are the critical nodes of the USAF's current method of deployment, the critical nodes of the JRSOI process, and the effect on the USAF's deployment time line.

The second area of evaluation will be to look at how an increase in demand for pre-positioned assets afloat will effect the plans of other component commands and of the supported commander. Some areas that may cause some concern are the ports and their ability to handle multiple ships, offload capabilities at the ports, and surface transportation capabilities. Most of these concerns effect the Army and their ability to perform the first three stages of the RSOI process. In addition to the change to the Army supporting the USAF deployment process, there will also be a change to when the Army has to be in place to support port operations. This thesis will look at the effects of supporting USAF pre-position ships and what effect that will have on the Army's flow of deploying forces.

Methodology

The methodology used to accomplish this thesis focuses on a critical path method (CPM) of analysis. CPM analysis was developed by DuPont Incorporated around 1958 to analyze construction projects to identify key tasks that could affect both time and costs of a project.[3] CPM accomplishes this by identifying the activities and events that need to be accomplished to complete the project.[4] When the activities and events are clearly identified, they are networked together defining the paths between them and establish their precedence relationships.[5] Once the activities and events have been networked

using connecting paths the process can be evaluated to determine what can be accomplished ahead of time or simultaneously. Those events that must be accomplished before the next event can take place become the critical events or activities in the path that will effect time and cost of the project.[6]

The CPM will be used to identify the individual events in the current USAF deployment process and the JRSOI deployment process because all the events are sequential and critical to the success of the operation. The data for this analysis comes from joint publications, USAF instructions, and Army field manuals. Then, the two paths will be evaluated to identify the critical events that will effect the ability of the USAF to meet its deployment time line. This thesis will evaluate the critical events. To further help identify the positive as well as the negative aspects of pre-position afloat, a review of operational after-action reports by units, reports to Congress, US Government Accounting Office reports on defense readiness related issues, and published research material will be researched. Through the use of the critical path analysis a clearer picture of the effects of the service's requirements for performing pre-positioning afloat and RSOI operations will have on the response needs of deploying USAF units. The thesis concludes by establishing the need for changes to joint, Army, and USAF doctrine to lay out tasks and responsibilities for the respective services and clarify differences in how the services define the RSOI process.

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[1]Department of the Navy, "Pre-positioning," *The U.S. Navy Military Sealift Command 1999 in Review* [Report on-line]; available from http://www.msc.navy.mil/1999inreview/pm3.htm; Internet; accessed 27 January 2001, 3 of 5.

[2]Paul E. Boley, A*float Pre-positioning,* [diskette] (Gunther Air Force Base: Air Force Logistics Management Agency, 2000).

[3] Jack R. Meredith and Samuel J. Mantel, Jr., *Project Management, a Managerial Approach,* 3rd ed. (New York: John Whiley and Sons, Inc., 1995), 336.

[4]Ibid., 337.

[5]Ibid., 338.

[6]Ibid.
1

CHAPTER 4

RESEARCH AND ANALYSIS

> What is quite beyond argument is that bright and shiny equipment manned by battle-worthy and dedicated men is not going to frighten or deter a potential aggressor, unless he can perceive that all these components of support are also in the order of battle.[2]
>
> Admiral of the Fleet, Sir Peter Hill-Norton

Introduction

Increased operations tempo over the last ten years and a largely CONUS-based force has focused attention on creating a more effective global power projection capability. Power projection is key to the flexibility demanded of military forces. It provides options for responding to potential crises and conflicts even when they have no permanent presence or a limited infrastructure in a region.[3]

In order to enhance flexibility and responsiveness, the USAF organized a majority of its total force into ten Aerospace Expeditionary Forces (AEFs); two dedicated on-call AEWs; five Lead Mobility Wings; and with Air Operations Center and Air Force Forces Command and Control elements. The objective of these expeditionary forces is to meet a theater CINC's needs by employing tailored and responsive air package to create the required strategic, operational, or tactical effects.[4] AEFs can be lethal or nonlethal in nature, thereby providing the National Command Authority with a full range of force options. In some cases, an AEF may be comprised principally of airlift assets when the operational focus is nonlethal (example is humanitarian assistance operations), in nature and its success hinges directly on support provided by airlift and air-refueling assets.[5] The issue to be analyzed in this chapter is how the AEFs currently deploy using land-based pre-positioned WRM and what the implications are if they switched to using pre-

positioned WRM afloat. In order to accomplish this analysis, the current USAF deployment process and the proposed MPP process will be explored.

Current Deployment Process

Joint Publication 4-01.8 defines deployment as "the movement of forces and their sustainment from their point of origin to a specific operational area to conduct joint operations."[6] To bring the deployment process together USAF units deploy using two distinct phases of employment during a bare-base operation: the Erection and Construction Phase, and the Operation and Maintenance Phase.[7] The USAF defines a bare base as a location with the minimum amount of runway and parking ramp suitable for aircraft operations and a source of water that can be made potable.[8] The Erection and Construction Phase of the employment can be further broken down into the advance echelon (ADVON) and the initial force portions.

The first phase of the Erection Construction Phase is the deployment of the ADVON. An ADVON team is a totally independent and multidisciplined team with both operational and support personnel represented. Each team usually includes a combat control element, an engineer site survey team, a services team, and a public health team with equipment and vehicles, mobile communications with weather element, and materiel maintenance, medical, contracting representative, security forces, and aeromedical evacuation personnel as required. To ensure the base is ready for deploying forces and to identify any major shortfalls that need to be addressed early in the deployment , the ADVON team is the first element to arrive at a bare-base location.

When the ADVON team arrives at the FOL, using the BSP as a guide, they work with the host nation to develop the base layout plan; aircraft parking plan; set up

command, control, and communications; install navigational aids; and establish an aerial port function that will off-load the initial force and its hardware when they arrive. This team is also responsible to sign for or receive possession of the pre-positioned WRM assets. If the WRM is not stored at the bare base then the ADVON team must be manned to support the reception, and staging of pre-positioned WRM that is required to stand-up the air base.[9] Current procedures for the deployment of the WRM from the centralized storage location to the bare base is accomplished by the contractor managing that location and the units managing them in conjunction with intratheater airlift. Once the ADVON force is satisfied the bare-base location can support and is ready to receive the required mission activities, deployment of the initial force can begin.[10]

The deployment of the initial force starts the second half of the Erection and Construction Phase and accomplishes the integration portion of RSOI. Initial force deployment will most likely contain the first aircraft squadron with limited operations, maintenance, and support functions; mobility equipment; and spares kits. As these forces arrive, they must be prepared to work upon arrival. They will be required to provide support for generating the aircraft for future operational missions as well as for the setup of their own shelters with the technical assistance of civil engineers.[11] Once the initial forces have arrived and the base is set up, the deployment phase is complete and the Operation and Maintenance Phase begins.

During the Operation and Maintenance Phase, the civil engineers focus more on improving base support capabilities. Support functions, such as security forces, health services support, supply, vehicle maintenance, communications and information, civil engineering, contracting, and financial services, are expanded to give the base a fully

operational capability.[12] In addition, during this phase follow-on forces may arrive. The follow-on force may contain additional aircraft squadrons and an upgraded maintenance capability including functions, such as propulsion, environmental, and missile maintenance.

To smoothly transition from CONUS into the two phases of employment, the USAF has three deployment components. The first component is unit equipment, the gear that units deploy from home station via strategic airlift. The second is pre-positioned WRM assets. The third is purchased equipment from host nation sources.[13] Together these three components ensure a successful deployment.

The unit equipment portion of deployment will not be addressed because the USAF units do this portion extremely well. Strategic airlift regularly moves personnel and the aircraft specific equipment and parts. These factors do not vary greatly no matter what part of the world operations are conducted. Examples of unit equipment are: specialized test equipment for inspecting the avionics on a F-15C air-to-air fighter, crew chief tools and technical guidance publications, and spare jet engines. The other two components of the deployment process will not decrease the amount of airlift required. However, shortfalls in these areas could increase the needed airlift requirements. For example, if aircraft air-conditioning carts are not stored in WRM or cannot be purchased or leased from the host nation, then additional airlift is needed to move equipment. When executing a deployment the deploying unit makes some assumptions in order to determine what they need to transport:

1. Engineer tasks and priorities must permit combat sortie generation within seventy-two hours of engineer force arrival.

2. Airlift capability to the bare-base location exists.

3. Sufficient quantities of construction and materials handling equipment will be available although not always as early in the deployment as desired.

4. The bare-base location could be subject to hostile fire.

5. Sufficient quantities of Harvest Falcon equipment are available to support the aircraft and population mix.

6. Individual organizations erect their own tentage and shelters with limited technical support from engineer personnel.

7. Climatic extremes are not being encountered, which would force special actions such as installation of cold weather protection packages on bare-base assets.[14] These assumptions are based on information from the gaining theater CINC and knowledge of the forward-operating location. Most of this information is gained during the planning stages for pre-positioning WRM.

The second component of USAF deployment is pre-positioned WRM assets. WRM is probably the most critical of all for setting the stage of a successful deployment. The USAF accomplishes WRM planning and staging during peacetime using possible conflict scenarios within a theater as the basis of the planning. Using the scenarios, the planners proceed with the selection of possible forward operating locations (FOLs) and their approval by the regional CINC and host nation. Once the FOLs are approved by the CINC, his staff and the lead unit for these locations coordinate with the host nation to send in a team made up of operations, logistics, service support, and security planners to perform a site survey and develop a BSP. To ensure that support requirements do not change, plans are reviewed and updated every few years.

The BSP includes airfield suitability evaluations, vulnerability assessments, bed down assessments, recommended improvement areas, and equipment and vehicle shortfalls. Using the BSP, the USAF must determine the appropriate mix of pre-positioned resources to deploy forward.[15] Several dynamics effect decisions on the size, content, and location of pre-positioned WRM. The chief considerations are airlift availability and regional threats. Key to decisions made at this point is to increase on-call force responsiveness and supportability, and reduce airlift requirements.[16] To meet the goals of responsiveness and supportability, the WRM is currently pre-positioned using the starter and swing concept. The principle behind starter and swing is sharing resources positioned to meet current threats while maximizing flexibility. Starter stocks are assets required at or near the point of intended use until air and sea LOC are capable of sustaining operations. Swing stocks are the total requirements, minus the starter stocks. Swing stocks are positioned to maximize flexibility and are designed to support more than one theater.[17] These starter and swing stocks are made up of the Harvest Eagle and Falcon packages, previously mentioned in chapter 2. In order to tailor the Harvest packages for different locations, the packages are divided up into sets. These sets are:

Housekeeping Sets. Housekeeping sets include shelters, kitchens and dining facilities; showers, latrines, and self-help laundries; water purification, storage, and distribution systems; and electrical power generation and distribution equipment. Harvest Falcon kits include environmental control equipment for heating and air conditioning whereas Harvest Eagle kits do not. Each Harvest Falcon housekeeping set includes assets sufficient to support 1,100 personnel. Each Harvest Eagle housekeeping set supports 550 personnel.

Industrial Operations Sets (Harvest Falcon only). Industrial operations sets include facilities, equipment, and supplies necessary to establish and maintain base support functions, such as base civil engineering, supply, vehicle maintenance, packing and crating, chapel, field exchange, and others. Each industrial operations set supports up to approximately 4,400 personnel (one industrial operations set per four Harvest Falcon housekeeping sets).

Initial Flight Line Sets. Initial flight line sets include facilities, equipment, and supplies necessary to establish and support aircraft flight operations, maintenance, crash-rescue, and other flight operations-related activities for one aircraft squadron. Assets include facilities for flying squadron operations and aircraft maintenance. Limited hangers for fighter-sized aircraft are also provided. An initial flight line set is used for the first squadron deployed to a bare base.

Follow-on Flight Line Set. Each follow-on flight line set includes limited facilities, equipment, and supplies needed to support additive flight operations and maintenance needs for second and subsequent squadrons deployed to a bare base.

Harvest Eagle Utility Sets. Provides additive high voltage prime electrical power generation and distribution assets and environmental control units for support of a single Harvest Eagle housekeeping set.

Emergency Airfield Lighting and Mobile Aircraft Arresting System. Provide mobile airfield lighting and fighter aircraft arresting. (Four each in United States Air Force Europe, Pacific Air Force, and 49 Material Maintenance Group (MMG)).[18]

The following units are designated as responsible for storing, maintaining, managing, and reporting status for pre-positioned WRM: 609 Air Support Squadron

(ASUS), Shaw Air Force Base, South Carolina, for various South West Asia locations assigned to US Central Air Force; 49 MMG, Holloman Air Force Base, New Mexico, for assigned Air Combat Command assets; 607 ASUS, Osan Air Base, Republic of Korea, for assigned Pacific Air Force assets in Guam, Japan, Korea; 86 Material Maintenance Squadron (MMS), Sembach Air Base, Germany, for assigned United States Air Force Europe assets in Luxembourg, Norway, and other locations.[19] These centralized locations have access to railroads and highways for land haul, airfields for airlift, and some have access to ports for sealift. These storage sites are maintained using host nation agreements where host nation personnel maintain the storage facilities and the equipment or the whole operation is contracted out. Both methods have military oversight to ensure they maintain USAF standards, and they perform technical upgrades to equipment.

Because of the amount of cargo in each set, it is important to ensure that the flow of the support assets is timely and efficient. When the items are not properly managed, it could cause congestion at the air base as well as delay the deployment of operational units.[20] If the operational requirement is to have fighter aircraft on the ground within seventy-two hours of the engineer's arrival, having all the tentage and industrial sets up front will delay the arrival of the aircraft because the required emergency airfield lighting system and mobile aircraft arresting system will not have been installed. Because of the costs to purchase and maintain WRM in the forward location, planners, as part of the BSP survey, should evaluate the feasibility of using host nation support.

The third component of deployment is to purchase or lease equipment from host nation sources. Use of host nation sources, such as ACSA, to acquire equipment and supplies has the potential to ease the requirements for certain types of WRM or bare-base

assets. There are three methods of ACSA: payment in cash, equal value exchange, or replacement-in-kind commitments from allied hosts or coalition partners. Depending on supply availability and required delivery lead times, contingency contracting officers should also take advantage of local allied business entities and contract networks that are familiar with the markets and asset availability. The more that can be acquired locally the less that must be stored and maintained in ready condition. However, equipment and material from the host nation may be substandard or incompatible and must be checked before utilization to ensure compatibility with deployed assets, and that it is safe to be operated and maintained by US personnel.[21]

Transportation to the FOL

In the previous sections how deployments are planned, support equipment is stored, and who does the management and installation of the WRM were addressed. The last part of the current deployment process that needs to be reviewed is how the USAF gets the operational units and the WRM support packages to the FOLs.

Because the air mobility forces are limited assets and other services are vying for airlift to meet their deployment time lines, air mobility forces must be applied where they can make the greatest contribution to the most critical requirements. To prevent these limited assets from being misused during a major theater war the National Command Authority, with the advice of the Chairman of the Joint Chiefs of Staff, makes allocation decisions designating percentages of air mobility capabilities that can be made available to theater commanders. With respect to a specific theater or joint operations area, the CINC or joint force commander must prioritize requirements to ensure limited air

mobility assets are applied in a manner that effectively fulfills the time-phased force deployment concept.[22]

The USAF provides the nation the ability to rapidly project forces anywhere in the world through AEFs that integrate with air mobility forces. [23] In response to US Transportation Command validated movement requirements, Air Mobility Command (AMC) has primary responsibility for air mobility actions related to the support and execution of AEF deployments. AMC schedules, coordinates, commands, and controls air mobility forces.[24]

The air mobility forces that are used to accomplish the deployment of forces are a system of systems that combine airlift, air refueling, and air mobility support assets, processes, and procedures into an integrated whole. The air mobility triad best depicts this whole mobility system (see figure 5). Air mobility support provides the foundation for this triad. If required, the airlift and air refueling legs of the triad can operate independently of one another, but neither one can operate without the air mobility support leg.[25] Combining all three significantly increases the efficiency of airlift operations by making possible the direct delivery of personnel and materiel. This is accomplished by creating an air bridge as an air LOC linking the CONUS and up to two theaters. Using the air refueling leg of the triad makes it possible to accelerate the air bridge operations, since enroute refueling stops are reduced or eliminated. This reduces reliance on forward staging bases, minimizes potential en route maintenance delays, and enables airlift assets to maximize their payloads.[26]

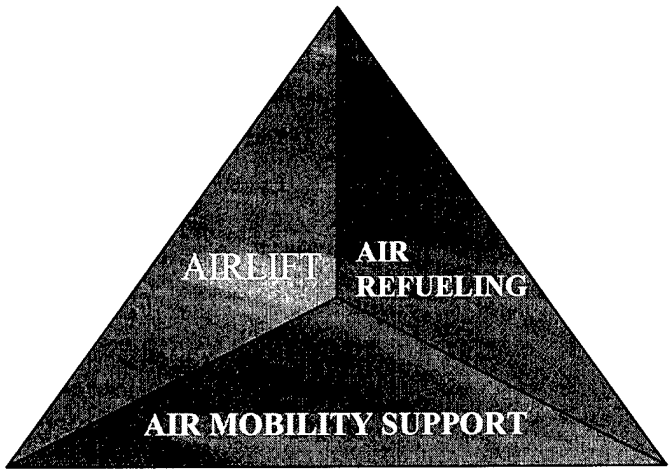

Figure 5. Air Mobility Triad

Based on limited intertheater and intratheater airlift assets that are available to the USAF, the pre-planning and forward deployment of WRM have major effect on airlift availability. Proper planning for WRM placement will reduce the intertheater airlift requirements. If the WRM items are not already pre-positioned at the FOL, CINC controlled intratheater airlift (C-130 aircraft) assets usually move them to their final location (outsized and oversized items require C-17 or C-5 aircraft). In a major contingency operation, some assets could be sealifted, if time permits. In overseas theaters, where bare-base assets are pre-positioned on the same continent, road movement or rail movement may be possible.[27]

APOD Operations

When AMC receives an execute order they immediately deploy tailored mobility support packages to establish en route support as well as establish the aerial port of debarkation (APOD). If the AEF deploys to an established location, AMC may send in

forces to bolster the ground operations. However, if AMC has to establish the APOD they will deploy a TALCE and or mission support team, along with force protection forces to provide the force reception. The TALCE is a mobile command and control organization that provides on-site management of mobility airfield operations to include command and control, communications, aerial port services, maintenance, security, transportation, weather, intelligence, and other support functions. TALCEs in support of on-call operations are capable of commencing operations at the FOL within four-hours of arrival, and can be fully operational within twelve-hours of arrival. These TALCEs units are designed to be self-supporting at a bare-base location for the first five days. Thereafter they require logistical re-supply support for aircraft parts and life support items.[28]

While the TALCE is arriving and getting set up, AMC has already launched airlift aircraft to pick up the deploying units. The first units on the ground after the TALCE will most likely be the ADVON team with engineers to receive pre-positioned WRM and start establishing the infrastructure. Within seventy-two hours of engineers arriving at the FOL, the initial force will start arriving with the operational aircraft.

Deploying with Maritime Pre-positioned WRM

The MRS, conducted in 1992, was motivated by concerns about DoD strategic mobility capabilities after Operations DESERT SHIELD and DESERT STORM. This study, and the success that the Marines had moving their Marine Expeditionary Units during DESERT SHIELD, influenced the acquisition strategy for many of the programs that are currently the backbone of today's strategic mobility program. These include the

large, medium speed, roll-on/roll-off (LMSR) vessel, the C-17 aircraft, pre-positioned stocks, and the Army Strategic Mobility Program.[29]

Since the 1992 MRS, the US has responded to numerous crises around the globe, most recent being Operation ALLIED FORCE in Kosovo. During this operation, the strategic airlift leg of the mobility triad was maximized and the sealift leg was virtually not used because of the field commanders' desires to have immediate availability of personnel and equipment.[30] In future rapidly developing crises, commanders in the field will still want their equipment and personnel transported as quickly as possible to a hot spot just as in Kosovo.

Even though airlift can move forces rapidly from CONUS to any theater, it is an expensive and inefficient means of moving bulk goods and heavy equipment. The more efficient use of airlift is the transport of light, early-entry forces, or for the movement of troops falling in on pre-positioned stocks or equipment transported by sea. To move large quantities of bulk goods and heavy equipment, sealift is the more economical means, but in comparison with air transport, it is extremely slow. Even the most recent fast transport ships can require two or three weeks to transit from CONUS to conflict sites in Asia or the Middle East.[31] To accommodate future rapid deployments the services must maximize all three legs of the mobility triad through transport planning and leveraging of future technology to make them more responsive.

Recognizing that the airlift leg of the mobility triad is overtaxed, the USAF is looking at the possibility of moving some of their deployment requirements to the pre-positioning leg of the triad. There are two types of pre-positioning in the strategic mobility triad (see figure 4)--pre-positioning ashore and pre-positioning afloat. As

mentioned above the USAF uses pre-positioning ashore in most theaters. However, the land-based pre-positioned stockpiles are expensive to maintain, require host nation approval and cooperation, may generate international tensions, can be a security risk, and may be difficult or impossible to move within the theater based on political tensions. Pre-positioning afloat, on the other hand, will allow the USAF to pre-position Harvest Falcon kits and vehicles on MSC vessels. A standard load would consist of two housekeeping sets, one initial flight line set, one industrial operations set, the corresponding vehicle set postulated by Air Combat Command, and additional line haul vehicles and trailers for helping move the assets from the seaport to the contingency location. These sets provide the capability to provide initial bare-base support for one AEW. MSC analyzed the above requirement and advised that a single Buffalo Soldier-class RO/RO ship would be the best way to store this equipment afloat.[32]

This vessel homeport will be in Diego Garcia, but can be sailed worldwide in response to any contingency and is not confined by diplomatic pressures of other countries. However, pre-positioning afloat is limited by cost, loss of capability during periodic maintenance, issues with port reception capabilities, and sailing time (see table 1).[33] Intertheater airlift will still be required to move personnel, specialized equipment, and parts even with pre-positioning of WRM.

Table 1. Sailing Times from Diego Garcia.

Sail time from Diego Garcia to:	
Al Iskandariyah, Egypt:	10.6 days
Bangkok. Thailand:	8.4 days
Izmir, Turkey:	11.9 days
Pusan, Korea:	12.9 days
Ad Dammam, Saudi Arabia:	7.1 days

Note: Speed for the ship is 13.5 (most economical), 16 (contingency cruise), and 18.0 (emergency). Times are calculated at 16 knots.

Source: Capt Paul Boley, "Afloat Pre-positioning for Non-munitions WRM", (Research project AFLMA PROJECT LX200001300 Presented to General Zettler, USAF/IL by the Air Force Logistics Management Agency).

With the introduction of pre-position afloat into the USAF's deployment strategy some aspects of their deployment plan will need to change to include the integration of deployment planning with other services deployment flow. Planning with the sister services is required to ensure personnel are available to perform RSOI functions and to ensure the USAF deployment time line is feasible and responsive. Deployment of the AEF initial force will still use airlift, but the ADVON will have to be prepared to perform different tasks to receive pre-positioned WRM. Instead of the WRM being land based and managed by contractors who will issue the WRM to the deploying unit or coordinate the transportation of the assets from the theater distribution point, the WRM will move through the JRSOI process.

Joint Reception, Staging, Onward Movement, and Integration

JRSOI process is the final phase of deployment and the critical link between deployment and employment of joint forces in the area of responsibility.[34] Another way to put it is reception is often considered the interface between the strategic and the operational levels of war; staging and onward movement normally occur within the operational level; and the integration phase represents the interface between the operational and tactical levels of war.[35] There are three principles that guide the successful execution of RSOI. They are: unity of command, synchronization, and balance.

Unity of Command. A single commander who is responsible for controlling and operating the RSOI process. The combatant commander has sole responsibility for

managing the flow of forces and equipment into the area of operations. They adjust resources based upon deployment flow, control movement in the area of operations, and provide life support to arriving personnel.

Synchronization. The goal of synchronization is to get the right personnel, equipment, and material to the right place in a timely manner. Detailed joint planning along with timely and predictable air and sea flow, visibility of assets as they move and the ability to adjust the movement schedule is key to synchronization success. When synchronization is achieved, the force buildup is expedited and units deploy minimum assets necessary to optimize throughput. This prevents overburdening the lines of communication.

Balance. Balance is closely related to synchronization and involves the direct control of the flow of assets through the theater. This is accomplished by managing the timing of the TPFDD flow up to the point of movement. TPFDD management by the supported CINC is a key activity for ensuring that the arrival time of personnel, equipment, and materiel coincide and do not exceed the capabilities of the intratheater distribution pipeline.[36]

For the USAF, properly synchronized and balanced JRSOI will be needed to expedite the transition of arriving materiel forward to the FOL. In the past, deployments were concerned mainly with movement of forces from the CONUS air base to the FOL, where success was measured. If this partial look at deployments is used when planning a deployment using JRSOI, it will cause bottlenecks and other inefficiencies that will dramatically slow buildup of AEF forces in-theater and hamper the Joint Force Commander's ability to maintain the operations timetable.[37] Each step of the JRSOI

process is a distinct task in the overall operation and to understand the effects of JRSOI on the USAF deployment process all four steps of the process need to be reviewed.

Reception

The first phase of JRSOI is reception or the process of unloading personnel and materiel from strategic transport, marshalling the deploying units, transporting them to staging areas, if required, and providing them life support.

For the first few weeks of a contingency, the aerial port of debarkation (APOD) will be responsible for handling all the influx of combat forces and combat support assets not provided by pre-positioning or available from the host nation. After the first few weeks, the first of the pre-positioned sealift ships will arrive in theater starting a dramatic increase of forces, equipment, and supplies.[38] This surge of equipment, material, and personnel must be monitored to maintain the balance and synchronization throughout the deployment using the theater-joint movement center to manage the TPFDD and intratheater movements. As mentioned earlier, the Joint Force Commander will have sole responsibility to manage the flow. One organization that the Joint Force Commander uses to manage the flow is the single port manager. As outlined in the Unified Command Plan and US Transportation Command Arrangements Agreement, US Transportation Command has the mission to provide worldwide common-user aerial and seaport terminal management and may provide terminal services by contract. This gives a single organization responsibility for all aspects of strategic deployment.[39]

When using sealift, the most critical nodes in the theater for supporting deployments is the seaport of debarkation (SPODs). The seaport's capacity and throughput capabilities are factors that make it an efficient way to move bulk or oversized

items. It is also these factors that influence the speed with which forces can be deployed, the order in which forces must be deployed and, to a large extent, the types of units that can be deployed. However, port throughput is a function of the operational environment and the level of port modernization (developed versus undeveloped).[40] In the diverse environments around the world forces could encounter any one of three types of seaports that could function as an SPOD: fixed, unimproved, and bare beaches. Fixed ports are improved, world-class ports, such as Dammam, Saudi Arabia, or Pusan, Korea. Unimproved or degraded ports are those found in places like Somalia and Haiti. Bare beaches are used where fixed facilities are unavailable.[41]

Both fixed and unimproved SPOD water terminals could include both seaports and inland water facilities capable of receiving deep draft vessels, coastal vessels, and barges. Many of the fixed locations will have a transportation infrastructure in place such as railways, highways, inland waterways, and adjacent airfields. Many of the terminals will already be equipped to handle RO/RO vessels, containers, general and bulk cargo, and lighterage. Figure 6 depicts a notional joint water port complex.[42]

If the operation is conducted in an area where vessels have to be offloaded over-the-shore or facilities are not available at a fixed port, JLOTS can be used to receive the forces (see figure 7). Navy and Army units conduct JLOTS operations. JLOTS is used to discharge cargo from vessels anchored offshore or in-the-stream, transporting it to shore or pier, and marshalling it for movement inland under a Joint Force Commander. JLOTS operations are considered when the port throughput capacity is insufficient to meet the needs of the operational plan or when suitable ports are not available. The magnitude of JLOTS operations extends from the reception of ships for offload through

the onward movement of equipment and materiel to inland marshalling and staging areas.[43]

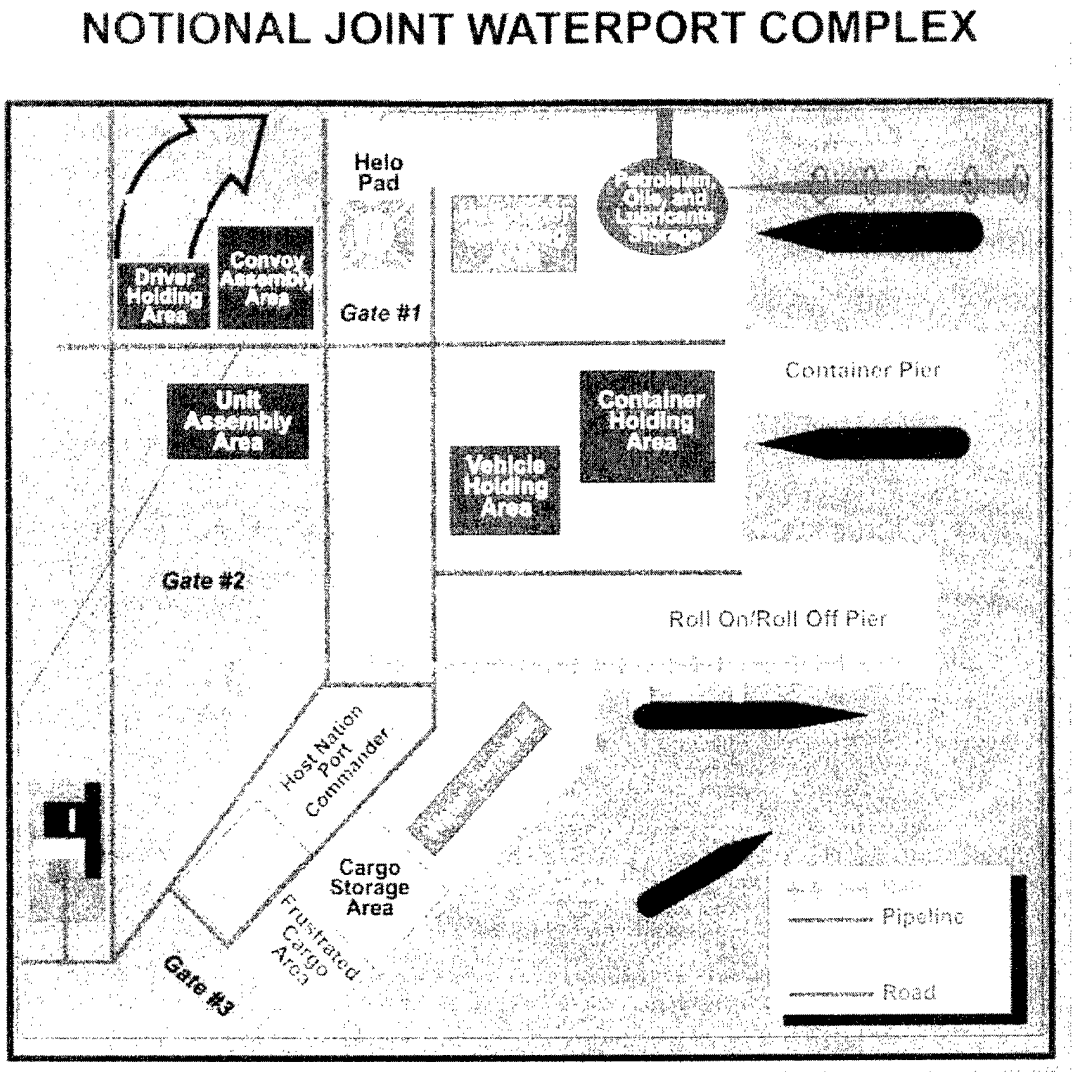

Figure 6. Source United States Transportation Command, Joint Publication 4-01.8 *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration* (Washington, DC: Defense Printing Office, 13 June 2000) iv-16.

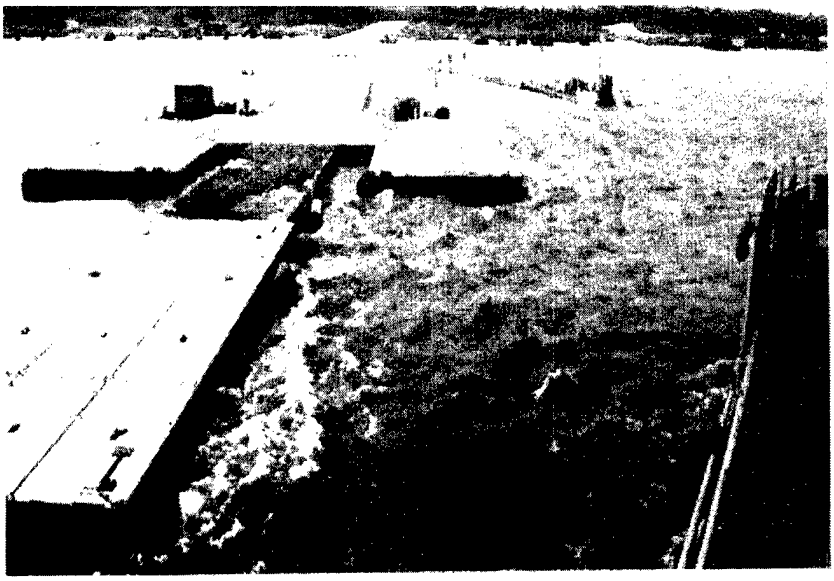

Figure 7. Joint Logistics Over-The-Shore Operations. Source: United States Transportation Command, Joint Publication 4-01.8 *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration* (Washington, DC: Defense Printing Office, 13 June 2000) iv-15.

Once the vessels arrive in port and the offload commences marshalling the equipment and supplies is an essential component of the reception process that facilitates port clearance. The timely movement of personnel, equipment, and materiel to a common assembly or holding area is the commander's first opportunity to reassemble personnel with equipment to begin to establish mission capability. To further enhance port clearance, the combatant commander must designate marshalling areas that support unit re-assembly without impeding the arrival ports for follow-on units.

Operation JOINT ENDEAVOR, 1995, is a good example of how important it is to select the right marshalling area. During this operation, the Army established a heliport to reassemble its helicopters that were shipped by air. The heliport occupied a portion of the airfield, which effected the number of airlift aircraft that could be parked on the field.

This action reduced the throughput capability of the airfield and consequently slowed the deployment. This was an Army decision that had strategic impact on airflow.[44]

Staging

Staging, as the second step in the JRSOI, is the process of assembling, holding, and organizing arriving personnel and equipment into units and forces, incrementally building combat power, preparing units for onward movement, and providing life support for the personnel until the unit becomes self-sustaining.[45] The staging process begins when personnel are taken from the APOD or SPOD to the marshalling areas in the vicinity of PODs to link up with their equipment and move to the staging area (SA). Within the SA, commanders continue the process of regaining the integrity of their units as personnel, equipment, and materiel are assembled and prepared for operations.[46] SAs are specific locations sited along the LOCs. The combatant commander will designate specific locations for staging in order to provide space and focus resources to support staging operations.

When selecting the location of the SAs, the combatant commander visualizes how forces are going to strategically concentrate and logistics support be provided before entry into the operational area. The combatant commander must evaluate the following factors to ensure that the SA is located to provide the greatest operational advantage:

1. Location of the TAAs or operational areas
2. Geographic constraints, availability of organic and host nation assets
3. Transportation infrastructure, distance to the ports
4. Force protection considerations.

All of these factors, along with the physical dimensions of the theater will ultimately determine the location of the theater SAs.[47] Normally the SAs are in close proximity or adjacent to the APOD or SPOD.

Once the location for the SA has been determined, the SA is built to support the flow of forces into the theater. The size of the SA or the ability to construct multiple SAs will influence the flow rate of equipment and personnel into the theater. The size of the SA and management of the TPFDD must go hand in hand or the support capabilities of the SA will culminate causing a slowdown in force buildup. When constructed, the SAs provide the necessary facilities, sustainment, and other support to enable units to become mission-capable.[48] Figure 8 is an example of a notional staging area.

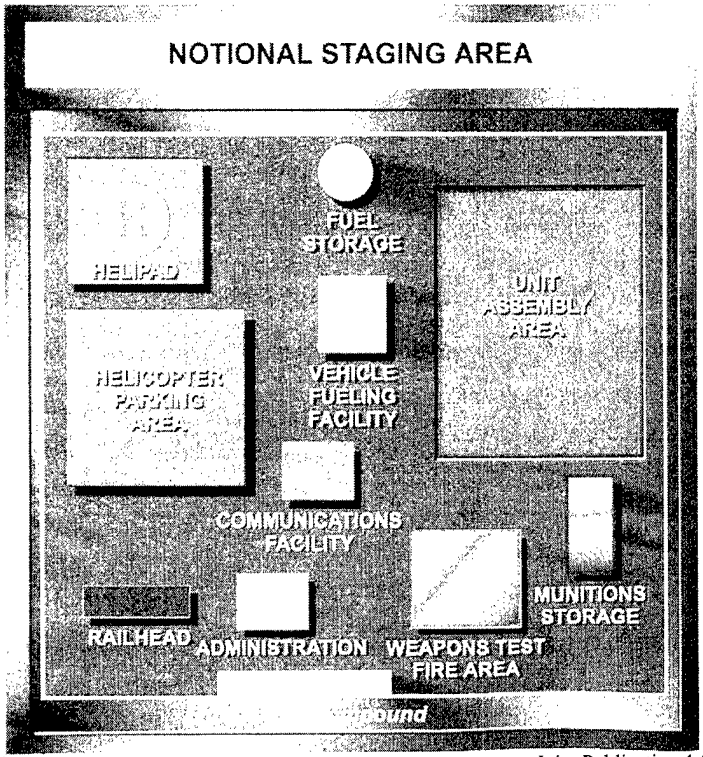

Figure 8. Source: United States Transportation Command, Joint Publication 4-01.8 *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration* (Washington, DC: Defense Printing Office, 13 June 2000).

After the commander has unit integrity, any required training is complete, and logistics support LOC established the staging process is complete and the forces are ready for onward movement.

Onward Movement

Onward Movement is the third phase of JRSOI. JRSOI is the process of moving units and accompanying materiel from reception facilities and staging areas to the TAAs or other theater destinations. This phase also moves arriving non-unit personnel to gaining commands, and moves arriving sustainment materiel from reception facilities to distribution sites as part of the sustainment operation.[49]

The onward movement process consists of several steps. The first step is to assemble and marshal forces in preparation for movement, that is build load plans, sequence loads and coordinate movement security requirements. The next step is the actual onward movement. The speed of movement and information flow in this step is vital for force protection and mission accomplishment.[50] To maintain and monitor the speed of movement and information flow the onward movement process has seven critical functions.

Movement control is one of the key functions that the combatant commander must establish to maintain control of assets moving through the theater. The movement control function consists of the planning, routing, scheduling, and control of personnel and cargo movements over LOCs. To manage these tasks the combatant commander can establish a joint movement center (JMC). This JMC must have sufficient communications and automation equipment (example: Joint Operation Planning and Execution System, Global Command and Control System, and secure phones) to insure the interface between the

strategic and theater transportation systems and the combatant commander staff is maintained. Another option available to the combatant commander is to assign movement control responsibilities to one of the existing movement control centers of the service components. Since the US Army already has movement control centers (MCCs) established to manage inland waterway and surface transportation the combatant commander usually delegates execution of this operation to the Army component commander.[51] A final option for the CINC is to task each of the services to manage their own movement control.[52]

One of the tasks within the movement control center is to update and monitor in-transit visibility (ITV) information through global command and control system. Strategic and theater ITV information is critical to successful execution of onward movement. The global command and control system provides vital ITV information for management of the continuous flow of forces and equipment into the theater. This information includes location, characteristics, and capacities of roads, aerial ports, and rail lines, combined with current status of highway regulation, traffic circulation and surface distribution plans, and movement programs. The system also tracks the detailed data on the cargo in transportation channels and the units involved.[53] Using ITV, the JMC can prevent LOCs from becoming saturated or under utilized ensuring host nations can still utilize their transportation systems and, if needed, refugees can be evacuated smoothly.

Communications is the second function of onward movement. The movement control elements must be equipped with sufficient communication and automation systems (example: SIPRNET, secure phones, global command and control system, and radio) to

provide an interface between strategic and theater transportation systems and the combatant command's staff.[54]

An obvious third function of onward movement is transportation. Close coordination between the nodes, routes, and host nation assistance should be coordinated to maximize the speed of movement. As previously mentioned this coordination is essential for minimizing congestion because in most cases the services, allied units, and the host nation populace will be using the same networks.[55]

En route supply and services support is a fourth function of onward movement. The support provided by the en route support activities provides for the continuous flow of personnel within the theater. These locations provide limited maintenance capability, fuel, food, and billeting facilities.

Convoy support sites are among the most critical of all the en route supply and services functions. They provide the bulk of en route support during onward movement. The services provided by convoy support sites are based upon such factors as distance between LOC nodes; number and location of support bases; and main supply routes' congestion, condition, and force protection.[56] Figure 9 is an example of a notional convoy support site.

The fifth in the list of onward movement functions is host nation support. Host nation resources and facilities are essential to the successful employment and deployment of forces. Host nations can often provide a variety of services through their national agencies and civilian labor force, for example food service workers, use of facilities, and transportation assets and personnel, to allow US Services to reduce the amount of cargo and personnel required to support onward movement.[57]

ACSAs are the sixth function, and they provide US pre-negotiated support for potential war scenarios. These agreements allow the US Services and armed forces from other countries to trade logistic services and goods. These transactions must be either reimbursed, replaced in kind, or exchanged for equal value.[58]

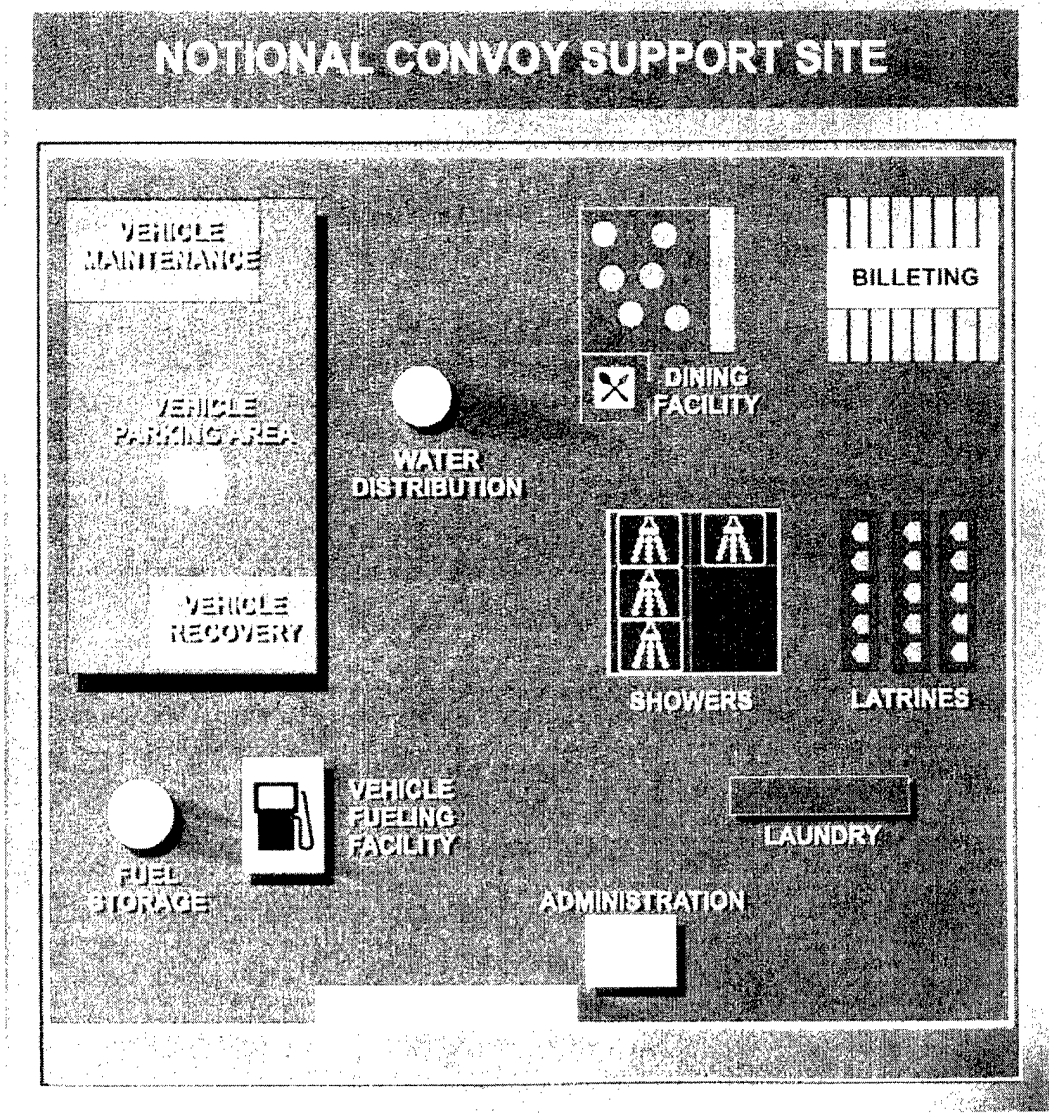

Figure 9. Source United States Transportation Command, Joint Publication 4-01.8 *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration* (Washington, DC: Defense Printing Office, 13 June 2000).

The final function making up the onward movement process is force protection. The focus of force protection is to minimize the enemy's opportunity to inflict serious losses and delays. It must be assumed that the interdiction of the LOCs will be an integral part of the enemy operation plan therefore the combatant commander must create plans to counter their actions.[59]

Integration

Integration is the final step in the JRSOI process. This step is the synchronized transfer of units and forces to a designated component or functional commander for employment in the theater of operations.[60] The purpose of integration is to seamlessly integrate mission-capable units into the gaining command. Units accomplish this process by continuously monitoring the progress of command and control and the completion of key logistics functions. The force tracking of mission capability components helps predict when integration can begin and how long it will take to complete. Integration is complete when the receiving commander establishes command and control over the arriving unit, unit logistics support transfers from the JRSOI organization to the gaining command, and the unit is capable of performing its assigned mission.[61]

JRSOI Analysis

After reviewing the JRSOI process it would seem that the structure of the process is geared more towards the deployment needs of a US Army deployment. However, the process can be adapted to the needs of the USAF. Using the previously defined JRSOI concept, the USAF would only use the joint reception, staging and onward movement portion of the total JRSOI process. Integration would not be a part of the process for the USAF because integration is not operationally dependant on the JRSOI process.

MSC would sail the pre-position ship to the port and the reception process would be performed using published joint doctrine. Since the Army is the port manager for the DoD, when the USAF decides to perform maritime pre-positioned operations they must coordinate with MSC and Military Traffic Management Command, through US Transportation Command, to ensure that port operations are established. In order to offload specialized equipment the USAF may be required to deploy qualified personnel to board the ship while it is underway or as a part of their ADVON. These personnel will prepare equipment for offload and assist the stevedores or US Army personnel at the port. Once the reception and marshalling stage is completed, it is time to go to the next stage in the JRSOI process.

Staging, as previously defined, is the process of assembling, holding, and organizing arriving personnel and equipment into units and forces, incrementally building combat power, preparing units for onward movement, and providing life support for the personnel until the unit becomes self-sustaining. Army pre-positioned assets consist primarily of war-fighting equipment (tanks, antipersonnel carriers, and others) whereas the USAF pre-positioning consists entirely of support and sustainment equipment so an operator for each peace of equipment is not necessary. The only support that may be required at this time, depending on the location of the staging area, would be life support for the augmentees assisting with the offload of the vessel. Since the USAF air expeditionary forces and direct support equipment are airlifted to their FOL, the staging process required would be limited.

The third stage of JRSOI is onward movement. Under the USAF's current proposal for MPP of WRM, the ship will have enough transportation assets to provide a minimum

organic line haul capability necessary to move all the equipment from the SPOD to the final destination.[62] Assuming that ground transportation is used instead of intertheater airlift, once the cargo is offloaded and marshaled the convoy will need to be built. After the convoy is loaded and cargo documented, coordination through the JMC or the designated movement control center is accomplished for approval of the route, time, and speed of travel to deconflict the movement with other actions taking place in the theater. At the completion of the onward movement phase, the WRM assets will be located at the USAF FOL.

With the WRM assets at the air base the ADVON team will go through the steps of receiving the cargo and starting the process of base buildup, as laid out at the beginning of this chapter. Therefore, instead of an integration phase the USAF will start their initial stage of bare-base development. During the initial stage of bare-base development, ADVON and the engineer efforts are concentrated on accomplishing those tasks that are necessary to meet the requirement for combat sortie generation within seventy-two hours.[63]

Integration, as defined by the joint publications, is when the receiving commander establishes command and control over the arriving unit, unit logistics support have been transferred to the gaining command, and the unit is capable of performing its mission. For the USAF integration will not be accomplished in the flow that is addressed in Joint Publication 4-01.8, *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration*. Based on the joint definition, integration for the USAF may occur prior to deployment if the flying squadrons are flying operational missions en route to the FOL, they have an airborne command cell deploying with them or the integration may occur

upon arrival at the FOL. With the unique rapid global response capabilities that the USAF has, the integration phase happens so quickly that it is almost nonapparent and will happen simultaneously with the base buildup.

Effect On The Air Force's Deployment Process

The USAF is the most responsive projection of national power that can protect national interest anywhere on earth in a matter of hours. "Its air and space forces through their inherent speed, range, and precision can respond to national requirements by delivering precision strikes, supplies, or surface forces where they are needed, when they are needed."[64] To maintain the responsiveness and speed of deployment, the USAF also has to have a highly responsive force support capability. Currently the responsiveness of the logistic support through the doctrinal concept of agile combat support uses current technologies to reduce the overall "footprint" of forward deployed support elements and develop a capability to reach back to the deep rear area for support when needed.[65] The need to provide highly responsive force support is certainly not unique to the Air Force, but a force that is poised to respond to global taskings within hours must be able to support that force with equal facility.[66]

After reviewing the current airlift and the proposed maritime method of deployment there is no clear-cut choice that would best support the AEF response. Each deployment method depends on situational controlled factors, (example: weather, seaport availability, transportation infrastructure, and availability of suitable airports). However, based on the unpredictability of availability of ports and transit time it is clear that maritime pre-positioning of WRM should not replace land-based pre-positioning but it should augment it.

If the crisis requires a response of forces within three days of C-day then the current airlift process is the one to use due to its rapid response capabilities. If crisis response requirement is not until C + 8 or C + 15, then the maritime method may be the better option. When determining whether to use MPP or not there are four factors that can be combined to determine responsiveness: (1) The transit time from homeport to the theater of operations (table 1). Movement of the vessel before C-day needs to be considered. (2) Once the vessel has reached the POD, the time to offload the vessel must be considered (table 2). (3) Based on the host nation transportation infrastructure the travel time from the port to the air base is factored. (4) Finally, the engineers and advance personnel will need a minimum of seventy-two hours for initial buildup. Add all four of these factors together based on the mobilization start date to get the response time required before the air base is ready for operational forces. CINCs will have to determine if this response capability is acceptable. Other factors that effect this calculation are the availability and suitability of pier space, safe passage from sea mines and hostilities, and the combatant commander's priority of offload between the Army, Marines, Navy, and Air Force.

Table 2. Average Ship Loading and Unloading Times

Ship Type	Percent Stow	Load Time (days)	Unload Time (days)
RO/RO	75	2	2
MPS	80	3	3/5*
LMSR	75	2	1.5/3*
FSS	75	2	2
Breakbulk/container	75	3	3

* Pier side/instream

Source: Military Transportation Management Command Transportation Engineering Agency, *Logistic Handbook for Strategic Mobility Planning*; available from https://140.153.122.11/pubs_res/700-2/default.htm; Internet; accessed 1 April 2001.

MPP of WRM as an added deployment option will not affect the USAF's desired deployment timelines. In fact, based on funding, terrain, and availability of airlift MPP could actually enhance the USAFs ability to deploy to certain locations. On the other hand, if MPP is to become the sole method of pre-positioning of WRM then it could have the opposite effect by lengthening the deployment time making the USAF less responsive.

Effect On The Army's Deployment Forces

According to US Army doctrine, the Army's desired end state is to provide a tailored corps of five divisions that is sustainable and with airborne, vertical insertion capability. The lead brigade must be in theater by C-day + 4, the lead division by C-day + 12. Land based pre-positioned assets will support the lead brigade. One fully supported heavy brigade, with sufficient supplies will be pre-positioned afloat and arrive between C-day + 8 and C-day + 12 (depending on sailing time). Two additional heavy divisions will be sea lifted from CONUS by C-day + 30 (armored, mechanized, air assault, [mix per CINC]). Airlift will move all the personnel to support the corps. The US Army objective is to have a full corps (five divisions and a COSCOM) in theater by C-day + 75.[67] With the Army using mostly sealift to accomplish their deployment of heavy equipment, the USAFs' mix of land-based pre-positioning, CONUS-based pre-positioning, and MPP does not have a major effect on the Army's end state. If the USAF shifts more WRM to the maritime option, the effects on the US Army would be negligible in a large developed port, like Ad Dammam, Saudi Arabia, that has three wide piers that total four miles of military useful wharf with highway and railroad access providing more than enough throughput.[68] If the same situation happened in an underdeveloped port where JLOTS

had to be used and the combatant commander decided the USAF assets were needed first, because of the logistics required to offload the vessels, the US Army could suffer lengthy delays getting deployed forward.

However, the Army is currently in the process of developing a concept to place a "medium-weight" brigade anywhere in the world within 96 hours, a division within 120 hours, and five divisions within thirty days.[69] This deployment time line is extremely airlift intensive in the early hours of the war. An example of the strain that the US Army movements can put on the airlift global mobility systems is Task Force HAWK during Kosovo. This movement of Army helicopters and support elements required over 300 C-17 sorties to haul 22,000 short tons of equipment, constituting 44 percent of the entire Operation NOBLE ANVIL airlift effort.[70] If the USAF used maritime pre-positioning it would free up some airlift to assist in the US Army deployment. But, if the US Army had a requirement to be in theater in ninety-six hours it stands to reason that the USAF would need to be in theater earlier or at the same time to perform offensive and defensive counterair missions, making maritime pre-positioning option ineffective. Depending on the port size, and capabilities, USAF maritime pre-positioning seems to have little or no effect on the US Army deployment process.

Responsiveness To Supported Commanders

As world technologies improve and adversaries become more knowledgeable in our war fighting capabilities, the combatant commander is going to need more instruments in his toolbox from which to choose. Maritime pre-positioning is responsive to the combatant commanders needs in that it provides an option to: (1) avoid political influences of countries storing WRM but not involved in the conflict, (2) to free up airlift sorties for

other priorities, and (3) to maintain response flexibility. According to an analysis performed by the AFLMA and the MRS-05 study, afloat pre-positioned material arrived in time (Marine and Army pre-position ships were included in the database) to support the Halt.[71] Again, the supportability of afloat pre-positioning is dependant on the situation and the rate of response that the combatant commander needs to meet the mission.

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[2]Department of the Air Force, Air Force Doctrine Document 2-4.4, *Basing, Infrastructure, and Facilities* (Washington, DC: Defense Printing Office, 1 November 1999), 21 (hereafter cited as AFDD 2-4-4).

[3]The White House, *A National Security Strategy for a New Century* (Washington, DC: Government Printing Office, December 1999), 11

[4]Department of the Air Force, Air Force Instruction 10-400, *Aerospace Expeditionary Force Planning* (Washington, DC: Defense Printing Office, 1 December 1999), 7 (hereafter cited at AFI 10-400).

[5]Department of the Air Force, Air Force Doctrine Document 2-6, *Air Mobility Operations* (Washington, DC: Defense Printing Office, 25 June 1999), 3 (hereafter cited as AFDD 2-6).

[6]United States Transportation Command, Joint Publication 4-01.8 *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration* (Washington, DC: Defense Printing Office, 13 June 2000) vii (hereafter cited as JP 4-01-8).

[7]Ibid., 33.

[8]Department of the Air Force, Air Force Instruction 25-101, *War Reserve Materiel (WRM) Program Guidance And Procedures* (Washington, DC: Defense Printing Office, 25 October 2000), 24 (hereafter cited s AFI 25-101).

[9]Ibid., 40.

[10]AFDD 2-4.4, 33.

[11]Ibid., 33

[12]Ibid., 33

[13]Captain Paul Boley, "Afloat Pre-positioning for Non-munitions WRM" (Research project AFLMA PROJECT LX200001300 presented to General Zettler, USAF/IL by the Air Force Logistics Management Agency).

[14]Department of the Air Force, Air Force Handbook 10-222, *Guide To Bare Base Development,* vol. 1 (Washington, DC: Defense Printing Office, 1 July 1996), 6 (hereafter cited as AF Handbook 10-222).

[15]AFI 10-400, 26.

[16]Ibid, 26

[17]Boley.

[18]AFI 25-101, 24.

[19]Ibid.

[20]AF Handbook 10-222, 16.

[21]AFDD 2-4.4, 22.

[22]AFDD 2-6, 7.

[23]Ibid., 3

[24]AFI 10-400, 13.

[25]AFDD 2-6, 2.

[26]Ibid., 53.

[27]AF Handbook 10-222, 16.

[28]AFI 10-400, 24.

[29]Boley.

[30]William S. Cohen, *Kosovo/Operation ALLIED FORCE After-Action Report,* Report to Congress (Washington, DC: Department of Defense Printing Office, 31 January 2000), 41.

[31] Department of the Army, Field Manual 100-17-3, *Reception, Staging, Onward Movement, And Integration* (Washington, DC: Defense Printing Office, 17 March 1999), 1-4 (hereafter cited as FM 100-17-3).

[32]Boley.

[33]FM 100-17-3, 1-4.

[34]JP [4-01.8], vii.

[35]FM 100-17-3, 1-3.

[36]JP [4-01.8], I-6.

[37]FM 100-17-3, 1-5.

[38]Ibid., 3-1.

[39]JP [4-01.8], IV-6.

[40]Ibid., IV-4.

[41]Ibid., IV-9.

[42]Ibid., IV-12.

[43]United States Transportation Command, [Joint Publication 4-01.]6, *Joint Tactics, Techniques, and Procedures for Joint Logistics Over-the-Shore (JLOTS)* (Washington, DC: Defense Printing Office, 12 November 1998), I-3.

[44]JP [4-01.8], iv-10.

[45]Ibid., V-1.

[46]Ibid., V-2.

[47]Ibid., V-8.

[48]Ibid.

[49]Ibid., VI-1.

[50]Ibid., VI-2.

[51]United States Transportation Command, Joint Publication 4-01.3 *Joint Tactics, Techniques, and Procedures for Movement Control* (Washington, DC: Defense Printing Office, 21 June 1996), III-7 (hereafter cited as JP 4-01.3).

[52]JP 4-01.8, VI-3.

[53]JP 4-01.3, I-9.

[54]JP 4-01.8, VI-5.

[55]Ibid.

[56]Ibid.

[57]Ibid., VI-7.

[58]Ibid.

[59]Ibid., VI-8.

[60]FM 100-17-3, 1-6.

[61]JP 4-01.8, VII-4.

[62]Boley.

[63]AF Handbook 10-222, 18.

[64]AFDD 1, 40.

[65]Ibid., 35.

[66]Ibid., 34.

[67]FM 100-17-3, 1-2.

[68]Military Transportation Management Command, *Port of Ad Dammam Saudi Arabia,* available from http://mtmctea.army.mil; Internet; accessed 1 April 2001.

[69]John A. Shaud, "The Army Ponders Its Future," *Air Force Magazine Journal of the Air Force Association,* November 2000, 36.

[70]Boley.

[71]Ibid.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Analysis Conclusions

The primary research question for this thesis is to determine the implications of the USAF plans to develop a MPP capability to support the deployment and sustained combat effectiveness of an AEW. Analysis of this research concluded that maritime pre-positioning is not a replacement for land-based pre-positioned WRM, but a valuable alternative to land-based pre-positioning for the war-fighting CINCs. The implications of MPP of WRM are both positive and negative. On the positive side maritime pre-positioning vessels can deliver 100 percent of the requirement on a single ship, have freedom of movement in international waters, frees up airlift, and provides the USAF a flexible response option to multiple theaters around the globe. The shortfalls that preclude the use of MPP to replace land-based WRM are: lengthy transit from homeport to the area of responsibility, availability of ports, possible requirement for JLOTs making offload time unacceptable, and host-nation transportation infrastructure. In order to answer the primary research question, this thesis reviewed the current USAF method of deploying an AEW. Then the thesis established the JRSOI process used to deploy when using maritime pre-positioned WRM. An analysis of the current and maritime processes yielded advantages and disadvantages to both methods. The following paragraphs will explain the advantages and disadvantages of each method of deployment.

The current USAF method of deployment uses land-based WRM. With the movement of forces based on C-day, land-based WRM gives the CINC the ability to respond more quickly to threats. If the WRM is colocated with the FOL, the only lift

requirement is for the operational forces. In this scenario tactical operations could commence in less than seventy-two hours. If the WRM is located at a centralized depot in the theater, WRM can be moved using intratheater airlift. This is much faster than moving the same material from CONUS. However, movement of WRM may take weeks or months. Enough WRM can be moved in seventy-two hours to begin initial tactical operations. The key to land-based WRM is the management of the flow of WRM to the FOL. Due to the diversity and large amount of cargo in each set or package, it is important to ensure that the flow of the support assets is timely and efficient. When the flow is not managed properly, it will cause congestion and delays at the air base as well as delay the deployment of operational units.[1] Land-based WRM allows for initial tactical operations in seventy-two hours when C-day is the starting point for movement of cargo or the response is unexpected.

Although land-based WRM is more convenient, it consumes airlift and requires international coordination to use and move the assets within and between countries. When the WRM is not pre-positioned at the FOL it is moved by C-130 aircraft and strategic airlifters (C-17 or C-5 aircraft for outsized and oversized items). Using C-17s or C-5s to move assets within the theater detracts from the USAF's ability to move personnel and cargo for all Services from CONUS to the FOL. According to a study performed by the AFLMA, the use of MPP ships would free up three to four C-17 aircraft equivalents for intertheater or intratheater airlift support.[2] When WRM is pre-positioned at regional locations, over-the-road or rail movement of WRM may be possible, freeing up intratheater airlift.[3]

Depending on storage location, WRM may require transportation across international borders to get to the FOLs. The movement across borders will require diplomatic clearance from all countries affected. If the countries do not want to become involved with the US actions they may refuse to allow the USAF to cross their borders making movement of WRM difficult. If the country in which WRM is stored declines involvement in the US actions, it may deny usage of the WRM, thus making the land-based WRM useless. These delays in the deployment process would be detrimental to the USAF response. To overcome these foreseen shortfalls, the USAF needs to pursue maritime pre-positioning of WRM to offset the shortfalls, in land-based WRM.

MPP vessels provide the US Air force a flexible response option to multiple theaters around the globe. Flexible response is the ability to move the WRM from theater to theater or to a specific country without having to coordinate movements diplomatically. Because these vessels are manned twenty-four hours a day, seven days a week, and operate in international waters, the capability to rapidly relocate WRM from one theater to another does not require diplomatic approval of a foreign nation until a port is selected. This freedom of movement allows the US to stage the vessels anywhere in international waters and or use them as part of a show of force declaring US intentions. The movement of the vessel to the theater prior to C-day reduces the limiting factor of sailing time when it is time to deploy forces.

The sailing time of a RO/RO ship can be a negative factor of MPP capability if the vessel is not moved to the theater before C-day. From Diego Garcia RO/RO vessels need seven days to get to Saudi Arabia or thirteen days to arrive in Turkey; transit speed is nominally sixteen to eighteen knots. If movement of maritime vessels is delayed until

C-day, there is no way to get the required WRM in place within the USAF deployment goal of seventy-two hours from C-day. For this reason, an early decision to move the MPP vessel to the area of responsibility is essential to the success of MPP. Other factors that may affect the delivery of WRM; these include the mining of the ports and seaways or the closing of straits preventing access to certain theaters. In these cases, deployment by airlift has the advantage.

However, moving the vessel as part of a show of force would position the vessel near the port before C-day. With this type of pre-positioning response of the vessel, maritime pre-positioning is more responsive than centrally located land-based WRM. Maritime pre-positioning cannot only deliver the initial response needs faster, but it has the capability to deliver the entire requirement of WRM faster than airlift.[4] The sailing time of the maritime pre-positioning vessel is key to getting to a theater, but the WRM still has to get off the ships and to the FOL. That is why the JRSOI process in conjunction with the ports and transportation infrastructure of the host nation are also important.

Under the MPP concept the USAF is no longer self-sufficient. MPP requires the USAF, through US Transportation Command, to use cross-service logistics for the movement and offload of the vessel. According to Joint Publication 4-01.8, *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration*, the US Army's Military Traffic Management Command operates the ports. To perform a maritime pre-positioning operation the USAF will have to establish a cross-service agreement with the US Army to provide personnel and equipment to off-load the vessel. The USAF will also require the approval of the host nation to use its ports and facilities.

When using the MPP of WRM the availability of ports and the capabilities of the host-nation transportation infrastructure are critical. Countries with fixed or world-class ports, such as Dammam, Saudi Arabia, or Pusan, Korea, the size of the ports and the availability of cranes and offload support equipment mean there will be no impact on the Services ability to meet the required deployment time lines.[5] These ports have sufficient space to facilitate the off-load--normally over 500-acres of paved open areas (a division requires 35.7 acres)--with immediate access to rail and major four lane highways to handle the throughput of the maritime pre-positioned fleet.[6] These places also have reinforced road systems that will also support the weight and quantity of equipment and supplies.

Countries with unimproved or bare beach ports, such as those found in Somalia and Haiti, provide an additional challenge to MPP. These ports would require the procurement of port-handling equipment, engineer work to improve the infrastructure to support the weight and quantity of equipment, and possibly the use of JLOTS. Due to the barging operations that are required using JLOTS, it is a much slower process. Depending on the weather, sea states, type of cargo, and port conditions offload time could double or triple. Because of the time-consuming logistics required to offload the vessels, all services could suffer lengthy delays and not be responsive to the CINC's needs. JLOT operations would prevent the USAF from meeting its seventy-two-hour response goal and could very well cause sister services not to meet their deployment time lines.[7] However, JLOTS may be the only method available to accomplish the mission.

Overall, airlift requirements are increasing, the Army is becoming more mobile, in order for both the USAF and Army to maintain its responsiveness in the future the use

of both sealift and airlift must be maximized. The analysis shows that maritime pre-positioning can be a responsive means to deploy USAF pre-positioned WRM. The maritime capability provides the CINCs with another instrument to enable them to project power. It also provides the CINCs with the ability to avoid political influences of countries storing land-based WRM in their area of responsibility.

Recommendations

The USAF should continue to pursue maritime pre-positioning as a deployment response enabler. Maritime pre-positioning should not be considered as a replacement for land-based pre-positioned WRM, but an additional, more flexible capability. To maximize the responsiveness of this capability, the USAF needs to establish three vessels. This will allow a vessel to be placed in the Mediterranean, Indian Ocean, and the Western Pacific for a response capability in each theater. To develop maritime capability for the combatant commanders the USAF needs to develop MPP, RSOI, and JLOTS doctrine.

The AFDD 2-4 Combat Support Series and AFDD 2-6 Air Mobility Series require updating to include the maritime WRM pre-positioning process and how it will integrate into the AEF concept. These documents should define the concept of MPP of WRM to meet the agile combat support goals of USAF logistics. They should also provide the basis for developing operational plans incorporating MPP.

Using Joint Publication 4-01.8, *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration*, and Army Field Manual 100-17-3, *Reception, Staging, Onward Movement, and Integration,* as references, the USAF needs to develop its own RSOI doctrine. It is recommended that the USAF use Field Manual 100-17-3, *Reception,*

Staging, Onward Movement, and Integration, as a starting point to develop Air Force Instructions for Air Force RSOI. This field manual clearly defines the RSOI process and is easily adapted to Air Forces requirements. These instructions need to provide guidance for USAF personnel responsibilities, procedures for port operations, convoy buildup, and road or rail movement. The tactics, techniques, and procedures developed should focus on synchronizing the Army and Air Force RSOI process.

The USAF needs to review and update Air Force Joint Instruction 24-102, *Logistics Over the Shore Operations in Oversea Areas,* dated 1983, to include references to Joint Publications 4-01.8 and 4-01.6 as well as Army Field Manual 100-17-3, *Reception, Staging, Onward Movement, And Integration.* This Instruction should also lay out the techniques and procedures that USAF personnel will adhere to when accomplishing LOTS functions.

Relationships to Previous Studies

Although there are numerous studies available on the subject of MPP, most focus on Army and Marine Corps MPP ship transit time, size of the ship or correct number of ships, and type of assets loaded on the ship. This thesis is one of the first to research USAF use of MPP and the JRSOI portion of the deployment process.

Suggestions for Further Research

Future research should explore the makeup of the different AEFs and the ability of the pre-positioned WRM to meet their needs. Activation of new weapon systems and technological improvements to old systems leads to some support equipment being obsolete. Selecting the correct national stock number for equipment is critical to having the proper types of equipment pre-positioned.

In addition to getting the proper equipment pre-positioned, research of JRSOI capabilities within each of the different theaters should be accomplished to evaluate the challenges to using maritime pre-positioning. Due to infrastructure within a region, some areas may require extensive engineer work in order to support maritime pre-positioning. These areas need to be evaluated for their ability to meet the combatant commanders desired response time. In countries where the ports are inadequate consideration should be given to adding the repair or construction of the ports to the CINC's Theater Engagement Plan (TEP). This would provide a capability for the military and the country's economy.

Summary

The purpose of this thesis is to determine the implications of the USAF proposal to use maritime pre-positioning of WRM as a means to significantly enhance agile combat support for future expeditionary aerospace operations.[8] It started with an explanation of the evolution of WRM forward basing and how the US went from a logistics mass in Europe during the Cold War to a mobile force depending on responsive logistics after the early 1990s. The thesis evaluated joint, Army and Air Force doctrine to define the process of deploying using maritime pre-positioning. This paper also focused primarily on the JRSOI aspect of the maritime pre-positioning operation.

After analyzing the current USAF deployment process of land-based pre-positioned WRM against the proposed maritime pre-positioned WRM process, this author has concluded that they are both necessary capabilities. The current process requires airlift and guarantees delivery of WRM to a theater within seventy-two hours. However, it takes a longer period to complete the full-deployment process. Conversely,

maritime pre-positioning takes longer to reach its destination, thus delaying the delivery of WRM. Nevertheless, when it arrives, it completes the deployment process faster than using land-based WRM. Conclusions from this analysis determined that land-based pre-positioning should be maintained and that maritime pre-positioning should be pursued to provide additional flexibility for the combatant commander. Technology may eventually reduce the WRM required, increase the speed of logistics ships, or increase the airlift capacity available. Until that time, both land-based WRM and maritime pre-positioned WRM make the services a responsive, formidable force around the globe--meeting the *Joint Vision 2020* goals of dominant maneuver and focused logistics to achieve full spectrum dominance.

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[2]Captain Paul Boley, "Afloat Pre-positioning for Non-munitions WRM" (Research project AFLMA PROJECT LX200001300 presented to General Zettler, USAF/IL by the Air Force Logistics Management Agency).

[3]AF Handbook 10-222, 16.

[4]Boley.

[5]United States Transportation Command, Joint Publication 4-01.8 *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration* (Washington, DC: Defense Printing Office, 13 June 2000), IV-9 (hereafter cited as JP 4-01.8).

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