**A COMPARATIVE ANALYSIS OF LOGISTICS READINESS OFFICER
TRAINING AND ADAPTIVE BASING COMPETENCIES**

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Abstract

This research examines Air Force Logistics Readiness Officer (LRO) training compared to core competencies identified in Adaptive Basing (AB) concepts. This qualitative research utilizes both comparative analysis and interviews to determine if the current formal training is in line with the known requirements for AB concepts. Additionally, should there be gaps in training identified, the research seeks to identify additional training options to aid in the success of the USAF and its LROs.

The research found that of the thirteen AB sub-competencies, current formal training begins to address many of them; however, the training provided is rarely at a performance level. Interviews have indicated that a gap in experience resulting from decreasing exercise and deployment opportunities makes performance level knowledge and exercising more relevant now than in the last 20 years. While there is progress to be made regarding training, the census is that regardless of training source, if opportunities for practical, hands-on experience are available, any training course will be of great value to the LRO community.

To my wife and daughter. Thank you for your love, support... and patience!

Acknowledgments

I owe a sincere debt of gratitude to my faculty advisor, Lt Col Matthew Roberts. Your rigor, support and guidance throughout this process and monumental time in my life cannot be overstated. Without you this would not have been possible. Additionally, I'd like to thank my sponsor Brig Gen David Sanford as well as Brig Gen Linda Hurry. Your guidance, leadership, and example will continue to influence not only my development but also that of those who I am blessed to lead in our Air Force.

Tony Crooms

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A COMPARATIVE ANALYSIS OF LOGISTICS READINESS OFFICER TRAINING AND ADAPTIVE BASING COMPETENCIES

I. Introduction

Background

Over the last 20 years of continued operations in support of the Global War on Terror, mission generation and air dominance have largely gone uncontested and relied on hardened infrastructure as well as relatively unfettered access to resources to sustain the fight. While the USAF has capitalized on this and been very successful, past success is no guarantee of future performance. Tomorrow's Airmen are more likely to fight in highly contested environments and must be prepared to fight through combat attrition rates and risks to the Nation that are more akin to the World War II era than the uncontested environment to which we have since become accustomed (C. Q. Brown, 2020).

As the Department of Defense transitions from sustained operations in the middle east to great power competition, it is essential that the United States Air Force (USAF) reset its thinking and ensure that the force is prepared to support the emerging concepts of a near-peer fight. To provide Combatant Commanders flexible, lethal options, the USAF has experimented with and adopted several Adaptive Basing (AB) concepts.

The Air Force logistics community's response to this changing environment is the concept of Persistent Logistics. This is the culmination of the ability to posture for a rapid transition to conflict operations, sense at the speed of relevance, and respond utilizing the combined-joint logistics enterprise (CJLE). Air Force leadership must prioritize training today's LROs to remain relevant and successful in the near-peer fight. This research explores the fundamental requirements of the logistics readiness officer (LRO) given its responsibility within

the Combat Support (CS) construct, current formal training objectives, and the AB core competencies presented by RAND.

Problem Statement

With the shift from sustained operations in support of the Global War on Terror to Adaptive Basing concepts supporting a near-peer fight, the LRO community needs to understand the necessary change in training to support. The war of attrition that the near- peer fight is expected to be will require new concepts and competencies to win. Without proper focus, training, and knowledge regarding evolving concepts, Combat Support (CS) functions will not be prepared to support the operations that are already being exercised.

Research Questions

1. What competencies need to be taught for an LRO to effectively operate in an AB environment?

2. Do current LRO core competencies account for AB competencies?

3. What gaps, if any, exist in LRO development regarding AB?

4. How best can we address these gaps in the LRO community?

Methodology

      The research that follows was conducted via a multi-method approach. Knowledge, skills, and abilities (KSA) for current basic, intermediate, and advance LROtraining were compared to those implied in the RAND study on "Building Combat Support Competencies to Enable Evolving Adaptive Basing Concepts." To glean a solution for any gaps, KSAs for both LRO training and the RAND report were comparedto current related USAF Weapons School training.

      Additionally, interviews were conducted with key leaders in the Logistics Readiness community to understand the current state of Logistics Readiness (LogR) andtraining pertaining to AB Concepts. LogR policymakers at Air Staff, Defense Logistics Agency (DLA), Air Combat Command (ACC), Air Mobility Command (AMC), the Supply Chain Operations Wing (SCOW), and Squadron Commanders experimenting with the implementation of AB concepts as directed by their higher headquarters (HHQ)are included in these interviews.

Implications

      This research focuses on only LRO training regarding the AB concepts. The intent is to effect meaningful change in LRO development should there be a need. If successful, this paper will indicate areas for improvement in training to requirements produced by AB concepts. Additionally, it will assist in justifying the need for flexible and responsive training courses as the USAF enters an era in spite of bureaucracy.

II. Literature Review

Chapter Overview

This chapter provides a literature review of Agile Combat Support responsibilities, adaptive basing concepts, and LRO training. The research is regarding the RAND Corporation's study titled "Building Agile Combat Support Competencies to Enable Evolving Adaptive Basing Concepts." The study provides an in-depth look at what the corporation believes is necessary for successful AB concepts in a near-peer conflict. The basic, intermediate, and advanced LRO courses are currently under re-write. This review is of the recently finalized training standards for both the basic and intermediate courses as well as the most recently approved Instructional System development (IST) report for the Advanced Logistics Readiness Officer Course (ALROC). Additionally, the Career Field Training and Education Plan (CFETP) and experiential training will be reviewed.

Relevant Research

ACS is the ability to create, protect, and sustain air and space forces across the full range of military operations. It is the foundational and crosscutting United States Air Force (USAF) system of support that enables Air Force (AF) operational concepts and the capabilities that distinguish air and space power-speed, flexibility, and global perspective ("AFDD 4-0 Combat Support," 2011). Figure 1 shows the ACS Overview and the functional capabilities required to achieve the desired effects. What was once termed ACS in AFDD 4-0 is now Combat Support (CS) in AFPD 4-0 while maintaining the exact definition, except for any mention of space because of the creation of the US Space Force. This emphasizes the fact that CS in today's USAF is by nature and must continue to be agile. Inherent to CS are the attributes of agility,

reliability, integration, and responsiveness. Attributes that echo throughout all AB concepts. The

Logistics Readiness Officer's roles in CS are Distribution, Logistics Planning, and Materiel

Management as defined below in Table 1 (Appendix: Functional Communities, 2020).
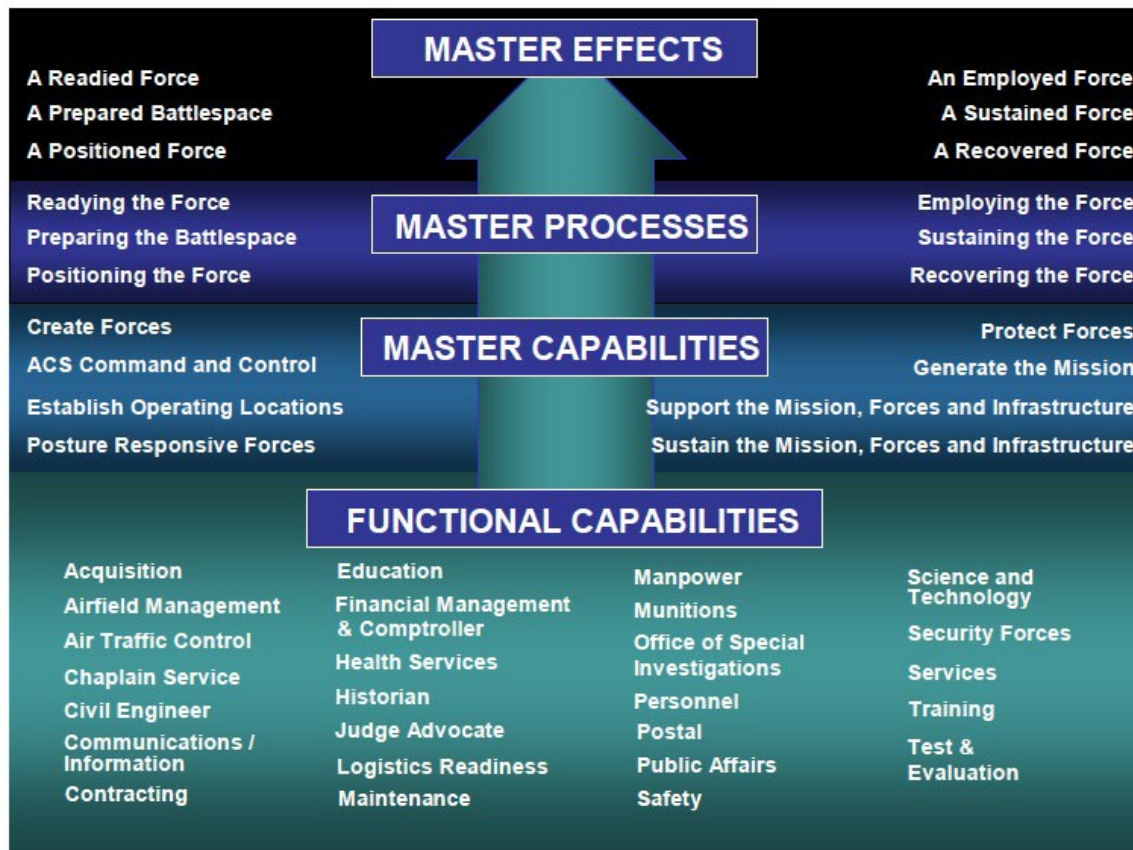

Figure 1: Agile Combat Support Overview (AFDD 4-0)

Table 1: Logistics Readiness Functional Areas and Roles within ACS

Functional Area	Role
Distribution:	Distribution personnel arrange for end-to-end transportation of passengers, equipment and materiel in support of deployment, redeployment, sustainment and retrograde. Distribution personnel provide a wide range of transportation services, including packing and intermodal containerization of materiel, movement planning, preparation for and movement of personnel and cargo (including required customs processes), receipt/delivery of inbound personnel and cargo, and in-transit visibility.
Logistics Planning:	Provides site planning, management of war reserve materiel, and implementation of efficient combat support operations across the competition continuum. Provides the planning component for deploying to, reception of forces in, sustaining, and redeploying from an operational area.
Materiel Management:	Provides assistance to commanders and equipment custodians in the proper transfer and accounting of assigned equipment assets. Procures, receives, stores, issues, and accounts for assigned readiness spares assets. Monitors, controls, and reports status of reparable assets. Acts as the primary liaison between the unit and supporting logistics support centers. It is an enabling capability that supports sustainment of Airmen, weapons systems, and facilities to provide responsive, consistent, and reliable support to the warfighter during peacetime and war.

Previous research on ACS is limited but has found room for improvement to effectively employ ACS. Walter Eady's 1997 study on ACS capabilities under wartime conditions found that for ACS to be a complete success, it will take the efforts of USAFDepots, Defense Logistics Agency (DLA), and our sister services to work together as a joint team. While his conclusion is heavily focused on materiel management, the implications apply to the much broader USAF supply chain (Eady, 1997).

Furthermore, given the 2002 Air Force intent of deploying a nominal expeditionary package (a 36-ship mixed fighter squadron of air defense suppression, air superiority, and ground-attack aircraft) within 48 hours to an unprepared bare base couldnot be met with today's support processes. The timeline can be met only with judicious prepositioning and even

then only under optimistic assumptions (Kristin F. Lynch et al.,1999). The RAND Project Air Force found that a complete reexamination of the AF's support system would be necessary to identify design trade-off and investment decisionsneeded to achieve the following capabilities to meet operational requirements (Tripp et al., 1999):

1. Supporting the spectrum of operations from permanent rotational requirements (e.g., Operation Southern Watch) to deterrence, halt-phase operations to Major Theater Wars (MTWs), and the transitions between them.

2. Dealing with uncertainty as to location and timing of deployments.

3. Evolving in response to changing political situations, new technologies, and newweapon systems.

Adaptive Basing Competencies

Because of the shift from sustained Central Command (CENTCOM) engagements in the global war on terror to a potential near-peer fight against China or Russia, it is safe to say that today's "flavor of operations" is AB in nature. AB is a concept best described as "the ability to avoid or survive attacks and continue operating in theater despite those attacks." (Mills et al., 2020). Acting as an umbrella, AB is a living concept that encompasses all warfighting ideas that may lend themselves to the overarching concept. As such, it is not limited to the ideas that have been identified and are in practice today.

The list of ideas and sub-concepts will continue to grow as innovative Airmen, researchers, DoD commissioned reports, and others, seek to identify tomorrow's war- winning theories providing a toolkit of operational options for Combatant Commanders to draw from. Table 2 is consolidated from the RAND research on ACS competencies for AB and lists and

describes the more commonly known AB concepts that have either been in discussion or are

being exercised today.

Table 2: Current Adaptive Basing Concepts

Concept	Description
Flex-basing:	PACAF developed this concept, under which threatened forces, given indications and warning (I&W), would temporarily escape, or flex, to alternate locations to wait out an attack or fight from those alternate locations. 11
Dynamic basing:	U.S. Pacific Command (PACOM) developed this concept, which aims to keep combat power survivable by keeping the logistics "tail" as close as possible to the combat "teeth." Simply stated, dynamic basing depends on dynamic logistics.12
Cluster basing:	This RAND Corporation–developed concept calls for several resilient bases of equal capability to be located close to one another to share resources and provide mutual support to one another in the event of attack. The Air Force's draft AB Concept of Operations uses the term more broadly—i.e., "a basing approach that groups bases and operating locations geographically for mission continuity, ease of C2, supportability, and mutual protection."
Rapid Raptor:	This PACAF concept calls for the quick deployment of a package of F-22 Raptors and supporting logistics to any forward operating base in the world and for having the aircraft in combat-ready status within 24 hours of employment. The package would use one C-17 aircraft for carrying materials, munitions, and maintainers and later for moving, refueling, and rearming a minimum of four F-22s in unfamiliar, austere environments, leaving a small footprint.13
Rapid-X:	This concept is very similar to rapid Raptor, but it was developed by HQ USAFE. Rapid-X calls for the quick deployment of any type of fighter aircraft (not just F-22s) to assist missions from bases that lack the full infrastructures that usually support fighter units in a major contingency. The concept calls for bringing in four fighter aircraft, rearming and maintaining them, having them fly another mission, and possibly vacating the assisted base. The intent is to use a wide variety of locations in Europe to challenge a potential adversary seeking to target aircraft and disrupt allied operations.14
Untethered operations:	This concept is closely related to Rapid-X and also originated from USAFE. It seeks to leverage robust basing and North Atlantic Treaty Organization (NATO) partner interoperability to complicate Russian targeting and create an arsenal of options for allied combat operations in Europe. Under this concept, a small package of fighters could drop into a base with the support of only the personnel and equipment that could fit on a single C-17, conduct operations for several hours without bedding down overnight, and depart with the C-17, leaving the base essentially as it was found.15
Joint forward area refueling point:	This joint concept is closely related to the U.S. Marine Corps concept of forward arming and refueling point (FARP) operations. The FARP mission is to provide ordnance and fuel for highly mobile and flexible helicopter and fixed-wing operations. The size of the FARP varies with the mission and the number of aircraft to be serviced. Normally, FARPs are transitory facilities used for a specific duration and mission.16 The Marine Corps also uses another variant of this concept, which is called Distributed Short Take-Off Vertical Landing Operations.17
Agile Combat Employment (ACE):	ACE originally was a PACAF concept that directly informed the command's numbered plan by incorporating a limited number of discrete base types. The term has now been adopted more broadly within the Air Force

Common throughout these concepts are three underlying competencies that RAND found critical to prioritize and capitalize on for the success of any AB concept. Table 3 lists these competencies and Knowledge, Skills, and Abilities (KSAs) implied in the study.

Table 3: Adaptive Basing Competencies

Competency	Sub-Comepetencies
Integrated Basing - using networks of bases	- Network Basing Design - Shared aircraft repair - Integrated Transportation - Integrated Supply Chain - Resource Management - WRM Utilization - Prepositioned Stock Utilization
Flexible Operations - offering maneuverable multi-platform mission generation not tied to a flying	- Transient Alert (TA) - Launch and Recovery (L&R)
Rapid Scalability - scaling integrated bases up and down to support a maneuverable force.	- Inter-theater Transportation - Intra-theater Transportation - Cargo Preparation - Load-Planning - Pack/Unpack the Base

With the ever-growing tool kit of AB concepts and the inability to know preciselywhich one will be called upon and when, the ACS community nonetheless can assess what these building blocks imply for its own force development (Mills et al., 2020).

Given the functional roles of the LRO in CS in conjunction with the competencies of Integrated Basing, Flexible Operations, and Rapid Scalability identified in the RAND report, the USAF LRO is not only relevant in AB concepts but plays a critical role thatneeds to be trained to.

AB concepts have been around for years before they became the flavor of today'sUSAF operations. In 2015, Maj Gen CQ Brown, Brig Gen Bradley Spacey, and Capt Charles Glover penned an article title "Untethered Operations: Rapid Mobility and Forward Basing Are Keys to Airpower's Success in the Antiaccess/Area-Denial Environment." This article focuses on the

requirement for fighter operations to be executed through forward basing and a light logistical footprint (C. Q. Brown et al., 2015). Untethered Operations by this standard requires a baseline to fit all fighter-supportinto a single C-17. "The single C-17 template forces load planners to prioritize support demands to keep the logistics tail as lean as possible." (C. Q. Brown et al., 2015). The article identifies that producing sorties from an austere location is primarily a matter of logistics. Whether it is capitalizing on ground transportation provided by a U.S. Army Theater Sustainment Command or taking advantage of partner nation interoperability delivered by USAF Air Advisors through the Building Partner Capacity (BPC) framework, the Combined/Joint Logistics Enterprise (CJLE) will be invaluable. "Improved interoperability across the spectrum of flight operations and agile combat support functions both reduces the logistics problem for allied planners and enables countries with few or even no modern fighters to participate in defense efforts" (C. Q. Brown et al., 2015).

Persistent Logistics

AF/A4 has responded to the shift to AB concepts with "Persistent Logistics." The concept is based on the premise that the future scheme of operational maneuver and expected attrition will place heavy demands on the logistics system requiring more significant levels of agility, protection, and resilience (AF/A4, 2018) The way forward is intended to set the stage for AB operations. The problem that persistent logistics targets isthat Air Force logistics is not adequately designed to project, protect, and sustain forces and maintain situational awareness to rapidly respond to changing conditions in an operational environment contested by a near-peer adversary. Solidifying the CJLE in a way that provides resources across a given theater that can be called upon during operations is how the USAF intends to address it. This concept is not new as the USAF has had units exercising and Air Advisors conducting training with our partner

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nations tobuild the framework for an interoperable CJLE. The concept of persistent logistics

now requires that the framework is in place and reliable. Regarding Persistent Logistics, the A4

Enterprise of 2030 will be:

1. Posture for rapid transition to conflict operations

   a. Great power competition will require us to reassess forces footprint in agreements and will require changes to how we organize train and equip.

2. Sense at the speed of relevance

   a. future conflicts will be steeped in information empowered by rapid decision-making sensing will allow allied forces to observe the operational environment and Orient the CJLE in real-time and near real-time providing actionable logistics intelligence

3. Respond

   a. the CJLE must be ready to respond to threats below the threshold of armed conflict. This will require a coordinated effort with other government department's allies and partners and industry

The background paper on Persistent Logistics states that, "Pre conflict investments

specifically in force development and training will pay dividends as we overcome setbacks and

develop operationally effective responses in contest in and coms degraded environments." So

how is the AF/A4 community getting after this force development andtraining opportunity?

LRO Training

LRO training has evolved over the relatively short existence of the career field. In2002

the Supply, Transportation, and Logistics Plans Officer career fields combined to create the

LRO, bringing each of their distinct competencies and proficiencies. The Career Field

Education and Training Plan (CFETP) provides information for career field functional

managers, commanders, supervisors, trainers, and technical training centers to plan, develop,

manage, and conduct a robust career field training program. Tables 4 and 5identify those

competencies and proficiencies listed in previous CFETPs for comparison as they have changed

over two iterations.

Table 4: LRO Core Competencies (21R CFETP, 2002)

				Years	<2	<4	<6
Competencies	Materiel Management	Distribution	Contingency Operations	Minimum Cumulative Competencies	1	2	3
Must gain one SEI minimum in each competency							
Special Experience Identifiers (SEI) (Proficiencies)	Materiel Management or Fuels Management	Distribution Management or Aerial Port Operations or Vehicle Management	Contingency Operations	Minimum Cumulative SEIs	1	2	3
Note 1: Officer may be deployed after completing and gaining experience in one SEI.							
Note 2: Officer is considered qualified after gaining experience in all competencies.							

Table 5: LRO Core Competencies (21R CFETP, 2017)

COMPETENCIES	Supply Management	Deployment, Distribution and Transportation (DDT)
PROFICIENCIES	Supply Vehicle Management Fuels Life Cycle Logistics	Transportation (Ground or Air) Logistics Plans

In his 2007 examination of the LRO training model and 2002 CFETP, Lovewell indicated concerns with the model failing to address the dynamic and expanding roles that LROs faced. (Lovewell, 2007). He noted that the LRO CFETP was often redundant outdated, not addressing critical areas to the degree which the operations tempo required.

Additionally, in 2009, Maj Trace Steyaert conducted research to identify the critical functional skills required and the definition of a "qualified LRO," as well as challenges impeding the progress of competency training. Through a Delphi study, polling squadron commanders and operations officers in the Air Combat Command (ACC) Major Command (MAJCOM), he found the following top ten responses to two ofthese questions, not rank-ordered:

Table 6: Research Question Responses (2009, Steyaert)

Question 1: In your opinion, what is your definition of a "qualified" LRO?
Competent understanding and knowledge of the LRO core competencies, completed all CFETP training tasks and has all special experience identifiers (SEIs)
Proficient understanding and knowledge of base level logistics functions (LRS or APS) and their interrelationships
Understanding of AF supply chain management and doctrine
Demonstrates good communication/managerial skills, is an adaptive plus independent worker and is accountable
Deep understanding and knowledge of strategic level logistics functions
Received AFIT logistics management degree, training certifications (i.e. supply chain management), career broadening (i.e., acquisitions, LCBP)
Deployed at least twice for 120 days each deployment
Knows when and how to ask questions and get needed answers
An officer that can lead as a flight commander with little supervision
Experience with and conversant knowledge in Joint and AF logistics

Question 3: In your opinion, what are the critical functional skills required of a "qualified" LRO?
IDO experience, deployment operations, TPFDD management, support planning (IGESP/beddown)
Briefing and analytical skills
Supply management, WRM management, warehouse management, HAZMAT
Understands logistics information systems (SBSS, DCAPES, GDSS, GATES, LOGMOD, OLVIMS, etc...)
Manage squadron ART and SORTs programs
Vehicle management and vehicle operations (including convoy operations)
Fuels management
Aerial port operations, cargo movement, load planning, TMO
Administrative experience (awards, decorations, performance reports, budget, discipline issues, enlisted promotion system)
Leadership

Of these responses, very few lend themselves to the agile, reliable, integrated, and responsive distribution, logistics planning, and materiel management that ACS calls for, and even fewer address the integrated basing, flexible operations, and rapid scalability AB concepts require.

The CFETP, currently under re-write, was last published on 30 Jun 2017. At that point, the USAF was in the midst of two conflicts in the CENTCOM AOR and heavily focused on joint operations and security in Iraq and Afghanistan. In 2013 research was conducted regarding the mission sets (competencies) of the USAF LRO (Roberts, 2013) Through qualitative content analysis of interviews and focus groups of logistics practitioners, Roberts found that the competencies of Deployment, Distribution, Materiel Management, Life Cycle Logistics, and Joint Logistics were valid at that time, and several knowledge, skills, and abilities (KSAs) could be combined for a more concise training plan. Accordingly, the 2017 CFETP consolidate these competencies into (1) Supply Management: Skills include the ability to forecast requirements accurately, identify and select supply sources, schedule deliveries, receive, store, verify and transfer product, and authorize supplier payments; and (2) Deployment, Distribution, and Transportation: Ability to plan, coordinate, synchronize, and execute personnel and cargomovement and sustainment tasks in support of military operations. Joint Logistics was then addressed within any corresponding proficiencies under each competency.

At the entry-level of USAF logistics readiness, an officer must analyze, explain, identify, discuss, or conduct actions or tasks within the proficiencies listed in the CFETP.The ability to do so demonstrates an ability to understand what is necessary to support thesteady-state operations of a main operating base. However, the 2017 CFETP Core Competencies description begins to open the door for the flexibility to address evolving requirements of the LRO career field.

Intent of Formal Training Programs

LRO Initial Skills Training

The Logistics Readiness Officer Course (LROC) is an "…AFSC awarding course is to provide the basic knowledge and skills needed to perform basic LRO duties. The goal isto send new LROs to the Basic Course within their first 120 days of assignment to the unit. The scope of training includes Introduction to Logistics, Basic Level Roles and Responsibilities, Supply, Fuels, Transportation, Vehicle Management, Logistics Plans, Life Cycle Logistics, and Capstone exercises." (CFETP, 2017)

Intermediate LRO Course (ILROC)

"This course provides training for 6-10 year Captains (O-3) going into Operations Officerpositions to perform duties described in the AFOCD. This course is a prerequisite to holding an Operations Officer or Command position. Instruction includes Doctrine, Joint Logistics, Air Force Logistics Competencies (Supply Management, Deployment, Distribution, and Transportation), Maintenance Support, FGO Roles and Responsibilities,and Logistics Readiness Officer Force Development. The course places particular emphasis on operational processes, which LROs should affect at home station, in Joint and deployment environments. Officers who have previously completed ALROC/IROC will be grandfathered from this requirement." (CFETP, 2017)

<u>Advanced LRO Course (ALROC)</u>

ALROC intends to "develop a premier warfighting logistics cadre to solve complex multi-domain challenges across the full spectrum of operations in support of the NationalDefense Strategy. The course teaches logisticians to leverage critical thinking skills and exploit the full capability of the Joint Logistics Enterprise through 400 hours of rigorous graduate-level academics focused on mathematics, analysis, and application to thrive injoint and multi-national environments." (ISD, 2019)

<u>Advanced Sortie Production Course</u>

AMMOS: United States Air Force Advanced Maintenance and Munitions Operations School prepares aircraft maintenance, munitions, and logistics readiness leaders for tomorrow's victories. USAF AMMOS provides the Air Force's premier advanced maintenance, munitions, and logistics training, expanding combat capability through graduate-level education. Graduates are highly skilled tactical and operational maintenance, munitions, and logistics readiness officers and SNCOs, capable of effectively leading aircraft maintenance, munitions, logistics readiness operations at home station or deployed. They can skillfully manage aircraft fleet health and overall unit personnel readiness and training challenges to ensure combat-ready weapons systems supporting an air campaign. Graduates plan and execute a unit's flying hour program and effectively deploy forces to accomplish expeditionary combat operations. They can also design and perform munitions operations and production. Graduates are charged to effectively share their knowledge as mentors to their senior leaders, peers, and subordinates. They also act as an advisor to wing leadership on aircraft maintenance,

munitions, and logistics readiness issues at home station or deployed. (*Nellis Air Force Base > Units > 57 WG*, 2021)

Additionally, in Jan 2021, in an interview with the President of the Air Force Association, the commander of the 57th Wing at Nellis AFB, NV, home to the AMMOS, said that the school "is really shifting their scan downrange right now to see what are problems on the horizon that are going to be rapidly approaching us here, and how dothey focus their efforts appropriately?" The focused effort has three pillars:

1. Figuring out how to utilize and sustain fifth-generation capabilities

2. Logistics Under Attack

3. Operating within austere environments

Experiential Training

Maybe without even knowing, the USAF has trained through experiential learning for a very long time. The inception of the well-known Red Flag exercise can find its basis in experiential learning theory. "Red Flag, which was developed to help the Air Force "train as it fights," is a simulated combat training exercise that pulls in the air forces of the United States and allies." (Boyn, 2000).

Experiential Learning is an engaged learning process whereby students "learn by doing" and reflect on the experience. Experiential learning activities can include but are not limited to hands-on laboratory experiments, internships, practicums field exercises, study abroad undergraduate research, and student performances. (*Experiential Learning » Center for Teaching & Learning | Boston University*, n.d.) Of all the core and additional

training required and available to the USAF LRO, only one identifies as focusing on experiential learning techniques, the ASPC at the AMMOS.

Summary

This chapter reviewed literature identifying the LRO, AB Concepts, and LRO training role. Additionally, relevant research was examined to provide a background on studies conducted before this research. These reviews indicated that there had been a lack of flexibility and responsiveness of training of the lifetime of the LRO career field.

III. Methodology

Chapter Overview

A multi-method approach using comparative analysis and semi-structured interviews is used for this research. Competencies and knowledge, skills, and abilities (KSA) for current basic, intermediate, and advance LRO training were compared to those noted in the RAND study on "Building Combat Support Competencies to Enable Evolving Adaptive Basing Concepts."

Additionally, semi-structured interviews were conducted with key leaders in the Logistics Readiness community to gain an understanding of the current state of Logistics Readiness (LogR) and training as it pertains to AB Concepts. Senior leaders and LogR policymakers at Air Staff, the Defense Logistics Agency (DLA), and Air Combat Command (ACC), and the Supply Chain Operations Wing (SCOW), as well as Squadron Commanders experimenting with the implementation of AB concepts, were included in these interviews. With the growing number of units leaning forward to experiment with

AB and its performance, only six interviews were conducted, four of which are with Squadron Commanders chosen due to their MAJCOM having tasked them to begin conducting these experiments.

Interview Participants

To understand the most current and relevant information regarding the employment of adaptive basing concepts and training requirements, the interview participants were deliberately chosen. All six participants are LROs in the rank of Lt Col, Col, or Brig Gen. Five of the participants are sitting commanders at the squadron level and above. These commanders have a vested interest in the evolving concepts to support the near-peer fight, and some are involved in exercising AB concepts and building the units to support AB concepts. The final participant resides on staff with oversight of LRO development such as ACC/A4R, AMC, A4T, AF/A4LR, etc.

Interview Questions

1. As we step away from the joint fight in CENTCOM and focus on the near-peer fight, what does a relevant LRO look like in the USAF?

2. On a scale from 1 to 5, how relevant do you believe LogR is to AB concepts?

3. On a scale from 1 to 5, how confident are you that the LRO career field is prepared to support AB concepts?

4. Given the KSA of the RAND study, do you believe these are all-encompassing, too little, or too much? Why?

5. If there are gaps in current LRO development, what are they?

6. Would you address these gaps through ALROC, a LogR Weapons School, or both?

7. As we build the curriculum to stand the Advanced Logistics Readiness Officer Course (ALROC) back up, would you assume any differences between ALROC and a LogR Weapons School?

8. Do you believe there's a need for or value added by creating a LogR Weapons School? Why or why not?

Summary

This chapter provided a brief overview of the methods used to complete this research. This multi-method approach takes advantage of real-world experiences in real-time and training curriculum to deduce if the training being delivered is the training that is needed.

IV. Analysis and Results

Chapter Overview

This chapter will review the responses to interview questions posed to six participants. The participants were chosen from across the AF and are currently serving in positions relevant to this research. Additionally, the chapter includes reviewing the three current LRO-specific formal training courses, the LRO Course, Intermediate LRO Course, and the Advanced LRO Course.

Interview Questions Answered

1. **As the USAF steps away from sustained CENTCOM operations, what does arelevant LRO look like in an Air Force preparing for a near-peer fight?**

The first question was asked to poll the perspective of the direction the LRO career field should be headed in as operational focus shifts away from CENTCOM. All six interviewees referenced experienced critical thinkers. The following are two examples.

"Someone who can think through and understand the enterprise-level movement ofpeople and resources."

"Logistician with an expeditionary mindset capable of integrating non-mission generating functions into a mission generation environment."

To achieve this, a solid understanding of the classes of supply, base-level operations, and exercising are necessary As evident in the analysis of training that follows, exercising is not a requirement for LRO proficiency. However, interview respondents clearly stated exercises and deployments are essential for building an LRO's critical thinking skills. These skills used to be honed during the multitude of deployments LROs participated in. However, the deployment opportunities for LROs have greatly diminished. With the withdrawal of the US from operations in Afghanistan and the ramp down of Central Command (CENTCOM) operations, the military services are adjusting their sights to a near-peer fight. With that comes a different type of relevance as the USAF and LRO shift away from decades of what was once "In Lieu of" (ILO) deployment taskings, then "Joint Expeditionary Taskings" (JET), where just in time training on how to be a soldier was provided and LROs had to "figure it out" in the deployed environment. As we move through the responses to the interview questions, we will understand just how valuable the "figure it out" mentality has been to the LRO career field.

2. **On a scale from 1 to 5, how relevant do you believe LogR is to Adaptive Basing(AB) concepts (i.e., ACE, FARP, etc)?**

3. *On a scale from 1 to 5, how confident are you that the career field is prepared to support AB concepts?*

The following two questions were asked to gauge both relevancy and preparedness of LROs in AB concepts. Figure 2 shows the consolidated results.
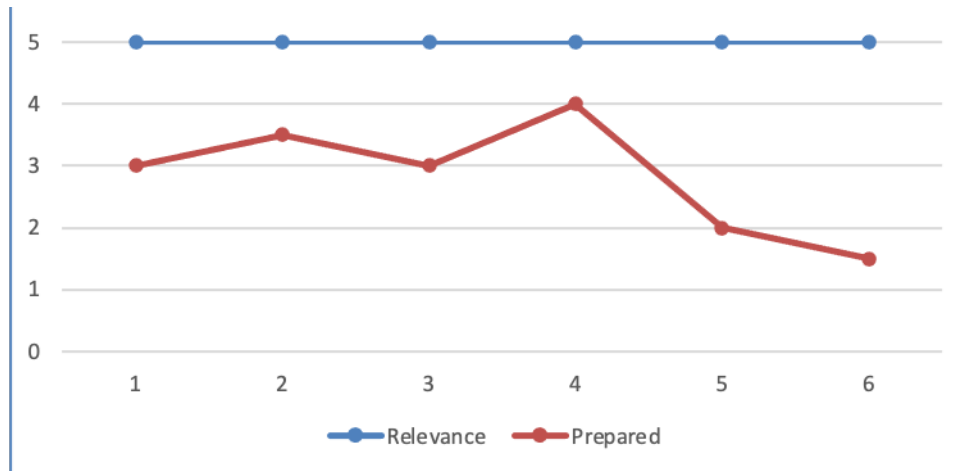
Figure 2: LRO Relevance vs. Preparedness for AB Concepts

"Logistics Readiness will be the linchpin as to whether agile combat employment (ACE)is going to happen or not. 90% of the ACE discussion over the last 22 months has been logistics. How can we move ourselves through the fight?"

While the respondents are unified in their opinion on the relevance of the LRO in AB concepts, there are varying opinions on how prepared the career field is to support them. The overwhelming consensus is that the decrease in wartime experience resulting from the withdrawal from the CENTCOM area of responsibility (AOR) has caused a generation gap of experience. Continuous deployments to CENTCOM, rarely covering the same competency or skill twice, learning new joint and command relationships each time, and having to define and measure success independently has likely trained a core of logisticians who can "figure it out" when thrown to the proverbial wolf that is AB. With that lifestyle of experiences behind the USAF, today's company-grade officers (CGOs)

are left without the opportunity to gain those valuable experiences on the job and in real-time.

"There's a generation gap of experience that was gained as a result of the continuous deployments in the CENTCOM joint fight. At home station, there are SNCOs to depend on, and you're not dealing with Partner Nations, Host Nation Support, joint engagements, etc.…"

For the past 20 years, the LRO has gained operational experience and knowledge and employed it at a tactical level. Without these opportunities, no deployments, and no exercises, the young CGO who has grown up in a peacetime environment will never learn how he or she should operate in a stressed, geographically separate, and geographically moving battle space unless changes are made to how we train and develop LROs.

4. *The RAND study identifies three broad competencies, Integrated Basing, Flexible Operations, and Rapid Scalability. Are these competencies insufficient, necessary, or excessive for LRO development?*

This question was asked to provide a point of reference for the remaining questions and gain perspective for the basis of the study. All but one respondent believedthat these competencies were necessary but insufficient. This indicated that while the competencies were valid, current implementation shows they are not as in-depth as needed. For example, the competency of integrated basing, being a broad category, does not explicitly address specific resource management skills that are key during present-dayemployment.

"Securing and executing tactical funding (i.e., Field Ordering Officer and Pay Agent) training are key."

5. *Regarding gaps in LRO development for AB concepts, there is a consensus that they are there. The difficulty at this point in AB is knowing what they are.*

"Yes! There are gaps in the Air Force, so of course, there are gaps in LRO development."

Currently, the USAF has not identified what it requires of an LRO when it comesto AB. This paper assumes the minimum requirements based on the functional areas of combat support and the LRO's responsibilities within that construct. The common question is, "who is the integrator." While the LRO combat support functional area of Logistics Planning includes implementing efficient combat support operations across thecompetition continuum, it is not a given (AFPD-4, 2021). Several combat support career fields would be justifiable given their

roles and responsibilities within the same constructand the needs of a given operation. Nevertheless, as the AF experiments to figure out what AB looks like, several staffs, wings, and other organizations have turned to their LROs for planning and execution. The interviewees are either living this now, have witnessed, or are receiving feedback that points to one common developmental gap.

Experience. Additionally, the ability to train as we fight, building and leading teams of diverse skillsets, and executing logistics as a weapon were key responses that are clearlynot addressed in any current formal training.

6. *Could we address these gaps with a LogR weapons school? How?*

7. *As curriculum to stand the Advanced Logistics Readiness Officer Course (ALROC) up, what do you see the differences being, if any, between an ALROC and a LogR Weapons School?*

8. **Do you believe there's a need for or value added by hosting a LogR WeaponsSchool? Why or why not?**

The final set of questions intend to provide an understanding of the type of training needed and the perception of the Advanced LRO Course (ALROC) based on what is currently common knowledge in the field. It is important to note that the title, weapons school, was used to gain a shared understanding of the intent across the LogR community. This research is not concerned with the title of the other weapons schools, training, only its reference to tactical level expertise. The stated intent of ALROC is to develop a premier warfighting logistics cadre with the critical thinking skills necessary toexploit the full capability of the Joint Logistics Enterprise (JLE). As of today, when the course comes back online, the target audience will be senior O4s and O5s. A LogRWS would serve the same purpose as other weapons schools (e.g., Advanced Sortie Production Course) that are currently operating, train students to be tactical

experts in their combat specialty while also learning the art of battlespace dominance (*United StatesAir Force Weapons School > Nellis Air Force Base > Display*, 2019). Those Captains and Majors likely coming out of a career-broadening tour and headed to be commanders of large flights or Operations Officers would probably be the target audience. Given the two definitions, these trainings could be very similar except for the target audience. As one interviewee stated, the products of the two programs are different.

With ALROC being an established, relevant, yet time-consuming course, one response indicated that,

"ALROC should be the LogRWS because of the time commitment."

There is shared concern among the responses regarding the significant amount oftime spent away from operations as officers shuffle through multiple, lengthy training courses. However, if substantial attention cannot be given to warfighting or "Logistics asa Weapon," there will be a great value added to the community with the creation of a LogRWS.

Finally, the overall need indicated by all participants was the LogR needs the ability to exercise to provide experience to the force. The ability to train as we fight is notan experience that any respondents alluded to being available to develop LROs who havelost such opportunities with the decreasing deployment opportunities. It is made very clear that regardless of the training source, the chance to test, fail, and learn in an environment that is not detrimental to the wartime execution of the mission is of the utmost importance.

LRO Training Analysis

LRO training is in the process of shifting from task-based to competency-based training. The core competencies have remained essentially unchanged over the last 20 years. Materiel management, deployment, distribution, and transportation sum them up nicely. Notable additions were Life Cycle Logistics within the materiel management competency and leadership as a core competency. Table 7 identifies the proposed core competencies for the LRO career field with the sub-categories (or proficiencies).

Table 7: Proposed LRO Core Competencies (2021)

Competency	Sub-Competency	Sub-Competency Description
Logistics Planning	Deployments	Mobilize capabilities to meet operational requirements
	Plans and Support Programs	Management and evaluation of logistics support capabilities
Supply Management	Life Cycle Logistics	Management of life cycle of commodities and logistics
	Consumable Commodities	Management of commodities which are consumed, including hazards material, petroleum, oil and lubricants (POL)
	Reparable Commodities	Management of commodities which are repaired, including aircraft parts, equipment and vehicles
Distribution Management	Transportation Management	Management of transportation system, including household goods (HHG)
	Surface Transportation	Managing cargo and passenger distribution functions through the surface transportation system.
	Air Transportation	Managing cargo and passenger distribution functions through the air transportation system.
Leadership	Unit Readiness	Evaluating and preparing unit personnel and equipment for deployment
	Inspection	Drive an effective unit inspection program
	Budget	Appropriate and execute a fiscally responsible budget cycle
	Training	Develop, monitor, and evaluate a relevant unit training program for all personnel
	Organizational Management	Organize, plan, and lead the unit

The proposed changes to the LRO core competencies are directly tied to the combat support competencies that LROs are responsible for. Additionally, the changes now include the core competency of leadership, integrating the four major graded areas across basic and intermediate level occupational training. Whether the core competency

of leadership will be included and expanded upon at the advanced level remains to be seen. Regarding KSAs, the proposed changes decrease the total Subject Knowledge Training (K) KSAs by 47 percent and increase the Performance Training (P) KSAs for the basic and intermediate courses by 22 and 49 percent, respectively. The P statement identifies that the individual has performed the task to the satisfaction of the course; however, the question remains as to whether or not this shift goes far enough in preparing LROs for the AB environment. Although there is an emphasis on introducing experience at multiple levels, there is no requirement for an LRO to test or apply his or her knowledge in an exercise or real-world environment. Tables 8, 9, and 10 provide the definitions of behaviors required and the breakdown of both current and proposed behaviors.

Table 8: Logistics Readiness Officer Course Behavioral Statements

Behavioral Statement Coding System	
Code	Definition
K	Subject Knowledge Training – The verb selection identifies the individual's ability to identify facts, state principles, analyze, or evaluate the subject.
P	Performance Training – Identifies that the individual has performed the task to the satisfaction of the course; however, the individual may not be capable of meeting field requirements for speed and accuracy.
PK	Performance Knowledge Training – The verb selection identifies the individual's ability to relate simple facts, procedures, operating principles, and operational theory for the task.
-	No training provided in the course or CDC.
X	Training is required but not provided due to limitations in resources.
Each training standard element is written as a behavioral statement. The detail of the statement and verb selection reflects the level of training provided in the course.	

Table 9: Existing LRO Formal Training CTS vs. AB Sub-Competencies

Existing CTS				
PCK	LROC	%	ILROC	%
K	148	87%	35	80%
P	1	1%	0	0%
PK	22	13%	9	20%
Total	171		44	

Table 10: Proposed LRO Formal Training CTS vs. AB Sub-Competencies

Proposed CTS				
PCK	LROC	%	ILROC	%
K	61	64%	25	41%
P	22	23%	30	49%
PK	13	14%	6	10%
Total	96		61	

Chapter two of this paper references the three competencies required for AB concepts: integrated basing, flexible operations, and rapid scalability. Additionally, there were thirteen implied sub-competencies or proficiencies listed. The proposed changes and CTS, which have successfully addressed some requirements for adaptive basing concepts, do have gaps remaining that need to be addressed. Of the 96 KSAs for the LRO basic course, less than half contribute to the AB KSAs. For the intermediate LRO course, less than one-third of the KSAs contribute to AB KSAs. The following charts show the breakdown of the CTS KSAs as attributed to the AB KSAs.
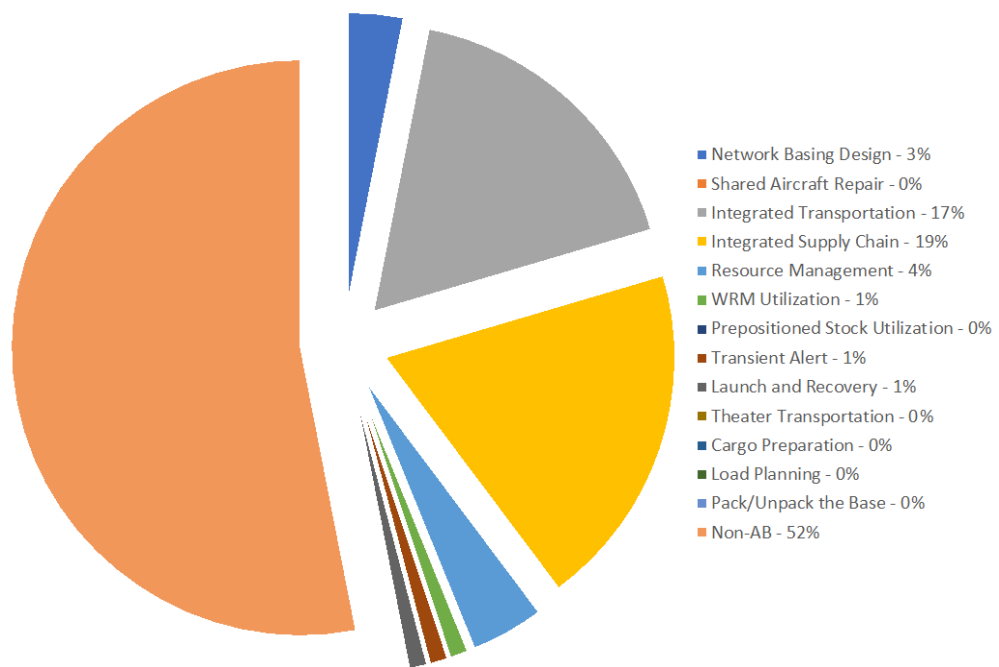
- Network Basing Design - 3%
- Shared Aircraft Repair - 0%
- Integrated Transportation - 17%
- Integrated Supply Chain - 19%
- Resource Management - 4%
- WRM Utilization - 1%
- Prepositioned Stock Utilization - 0%
- Transient Alert - 1%
- Launch and Recovery - 1%
- Theater Transportation - 0%
- Cargo Preparation - 0%
- Load Planning - 0%
- Pack/Unpack the Base - 0%
- Non-AB - 52%

Figure 3: LROC KSAs vs. AB Sub-Competencies
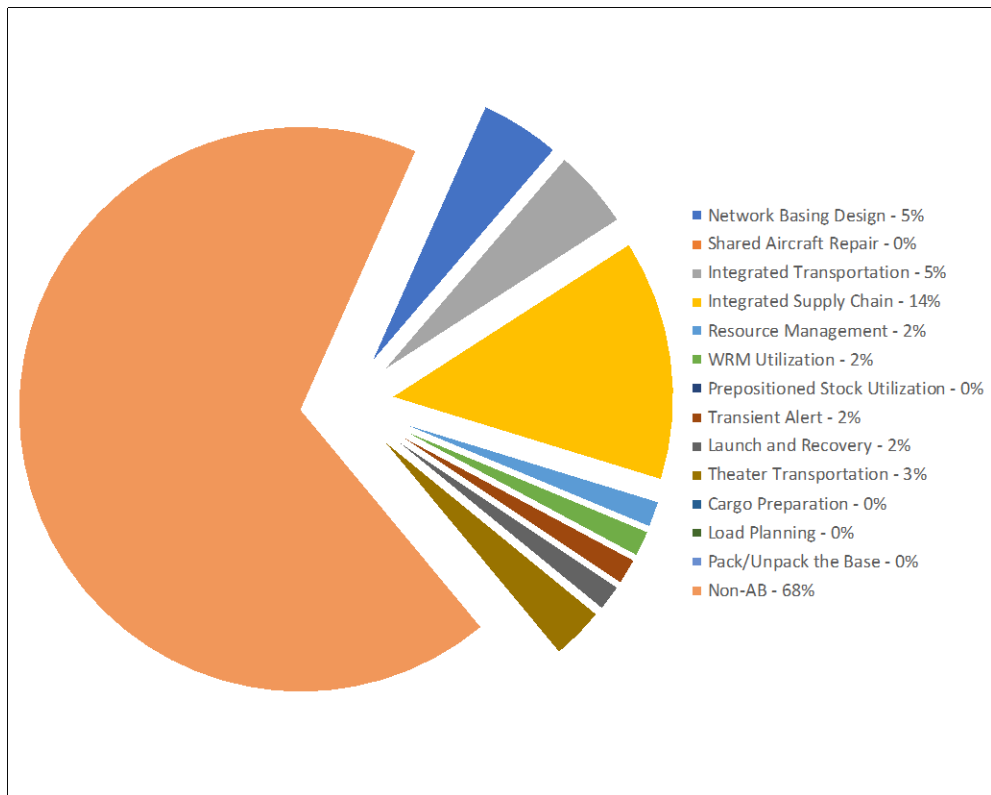
Figure 4: ILROC KSAs vs. AB Sub-Competencies

It is important to note that while several of the KSAs listed in the proposed CTSs for the basic and intermediate courses lend themselves to the development of the individual AB KSAs, very few have the potential to cover those KSAs comprehensively. For example, while plan, analyze, and execute flight and squadron budgets address aspects of the AB KSA Resource Management, it does not handle the FOO or PA responsibilities that appear relevant in the interviews. Therefore, there is a need to further integrate these AB competencies into the current LRO training model. Additionally, as AB concepts, competencies, and KSAs continue to evolve, some of the current topics may become wholly irrelevant or expand to encompass more than what is currently

35

known. Not having a comprehensive curriculum covering AB competencies between the

basic and intermediate courses is not ultimately disastrous to the LRO and its functional

responsibilities to the ACS construct. The LogR community is working to stand up the

next iteration of ALROC. Being the third of four AF/A4 offered formal training courses

for LROs, this course can be strategically placed in an LRO's career based on the needs

of the AF. The most current framework for the curriculum was approved in 2019 and

addressed many of the experience gaps cited in the interviews. It is organized into six

modules (Table 11):

Table 11: ALROC Modules

Module	Definition
1. Ready the Force	Organizing, training, and equipping a fit force to provide mission capability.
2. Prepare the Operational Environment	Preparing an operational environment conducive to mission execution. Analyzing, planning, and posturing forces, infrastructure (built and natural), and materiel for rapid employment.
3. Positioning the Force	Processes involving the right types and amounts of forces and materiel at the right places and times to meet mission objectives. Deploying, receiving, and integrating forces and materiel at the point of employment.
4. Employing the Force	Processes involving forces, infrastructure, and materiel meeting mission requirements. Generating the mission, providing right-sized support, and ensuring timely regeneration of forces and materiel.
5. Sustaining the Force	Sustaining and recovering the forces when conducting persistent operations. Maintaining effective levels of forces, materiel support, including the physical plant, and infrastructure capability for ongoing operations. Recovering forces, materiel support, and infrastructure damaged from attack, accident, or other incident.
6. Reconstituting te Force	Processes involving reconstituting forces to be readied for operations. Reset or redeployment of forces and materiel, ensuring airpower can be reapplied to meet operational needs.

These modules provide a framework that encompasses only bits and pieces of

the threeAB competencies but does address several of the KSAs. There are several

learning objectives within the framework that directly address some of the AB KSAs.

Figure 5 visually represents the breakdown of the 136 ALROC objectives as
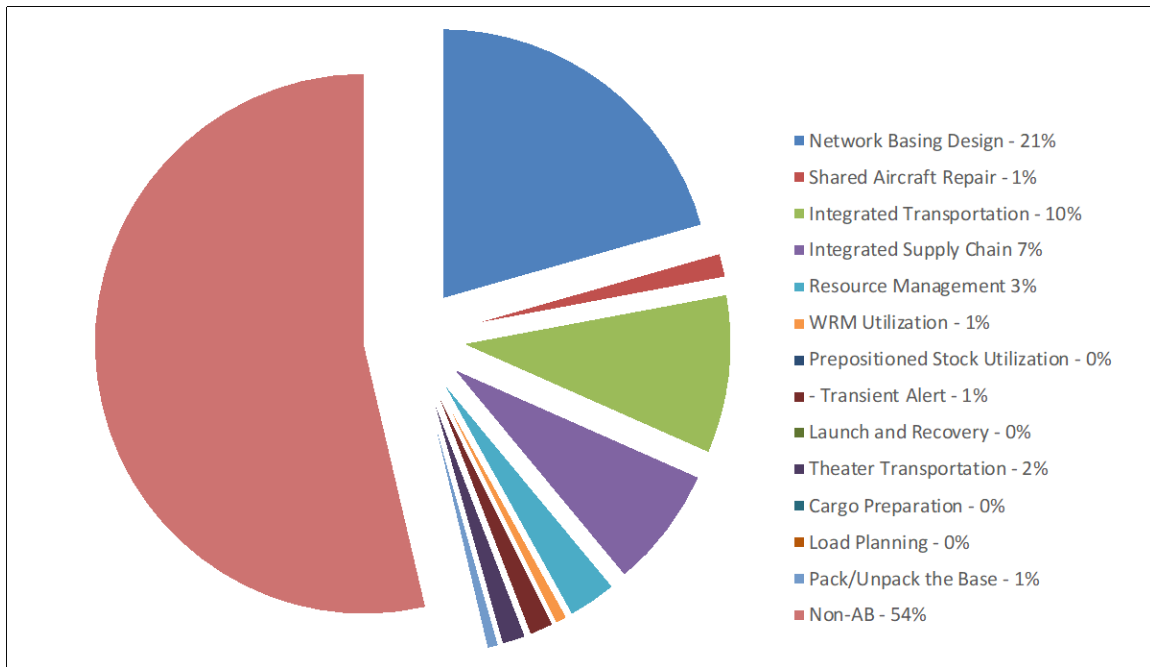
contributed to thethirteen AB KSAs.

Figure 5: ALROC Objectives vs. AB Sub-Competencies

Of the ALROC objectives, the most significant percentage is tied to Network Basing Design while Launch and Recovery, Cargo Preparation, and Load Planning remain unaddressed. Additionally, sub-competencies with one percent likely require more development to meet the intent. For instance, it was determined that shared aircraft repair was slightly addressed within the ALROC objectives. There are two objectives attributed to this, Readiness Spares Packages and Mission Support kits. While these two areas are critical to the generation of sorties, their focus solely on the materiel

management contribution leaves aircraft recovery, refueling, rearming, and other vital skills to be acquired through other training means.

Summary

Leaders in the field "figuring out" the LRO's contribution to the AB concepts are incredibly confident that there is a massive role for LogR. Current training has continued to develop surface-level skills necessary to succeed in some areas; however, with the limited availability of opportunities to deploy and exercise any skills, a gap is developing that may be critical in AB execution. Several of the sub-competencies in AB concepts are addressed through the three LRO-specific formal training avenues available, however, the bigger question of "What does the AF need of us?" will need to be answered to ensure that the requirements are comprehended and training successfully implemented.

V. Conclusions and Recommendations

Chapter Overview

This chapter reflects on the analysis of the research conducted regarding training to the competencies of AB concepts. Additionally, recommendations for action and further research are provided.

Conclusions of Research

Current and projected LRO training does a great job of identifying and training to the operational requirements for logistics in a near-peer fight. Given this research, there is high confidence that an LRO will be at the tactical level of execution during a near-peer

conflict. The greatest obstacle is access to the formal training or real-world opportunities that will make LROs as successful as they are relevant to the AB concepts.

After 20 years of operations in the CENTCOM AOR, AF LogR has come to rely on highly resilient, highly capable, long-duration main operating bases from which to provide its CS functions. These bases have seemingly been built and resourced to absorb the punishment of engagement with the confidence that the US will win in the end. AF LogR is not developed to fight any differently. AB concepts are based on the fact that the AF cannot afford to absorb the punishment as in the past. Operations and logistics will need to survive and persist from day one to win the potential attrition fight that a high-end, near-peer fight will be.

Additionally, as JET deployments decreased over the later years of CENTCOM operations, a gap of experienced LROs with the soft skills gained through engagements with combined and joint forces, host and partner nation personnel, and organizations has grown. Commanders in the field executing AB experiments and senior leaders acknowledge these gaps. The sum of the overwhelming need is the ability to train like we fight and exercise logistics concepts to gain the knowledge and experience necessary to win the fight.

USAF Weapons School is paralleled to the potentially training for AB competencies in this research. The comparison is made to reference the tactical expertise gained and the credibility associated with the completion. Based on this research, any training course that provides relevant tactical experience and operational knowledge to the LRO executing "logistics as a weapon" would be of great benefit to future AF operations. If not designated a USAF Weapons School, the LogR community will need

toidentify an avenue to promote the relevance and credibility of the course and its graduates.

Recommendations for Action

Target Audience

As ALROC comes back online, the course's framework covers numerous topics relevant to the AB competencies. The target audience for this course is senior O4s and O5s. Current experiments and exercises envision O3s and O4s on the ground executing tactical logistics within the geographically moving battlespace. Suppose this remains true and no additional training opportunity is offered to prepare these younger officers for AB competencies. In that case, the LogR community should consider shifting the target audience to include O3s and O4s.

Tactical Logistics Employment Course (TLEC)

If it is not feasible to adjust the target audience of ALROC, a tactical logistics employment course targeting officers with the potential to lead logistics within a geographically moving battlespace. This course would need to be extremely deliberate and include many of the topics included in ALROC. Additionally, to address time away from the unit, development should be sensitive to course length, consider training en route with permanent change of stations (PCS), or both.

Training Consolidation

In the interest of resource savings, further research should be conducted regarding the integration of AB competencies in current training curriculum. As several of these competencies are touched upon in the current curriculum of the three formal LRO training courses, it may be possible to expand upon the necessary skills sets within currently available avenues. Per this research, exercising and other experiential methods will be key in ensuring the experience need is well practiced.

Training Curriculum Flexibility

This research is based on the current AF interest in AB concepts. These concepts are both growing in number and evolving. Additionally, at this time, questions remain regarding what is required of an LRO. Training curriculum should be based on a framework that addresses tactical logistics employment but has the flexibility to adjust within that framework to new requirements and evolving concepts. An enduring course should be responsive and capable of shifting to what comes after AB.

Exercise LogR Flag

It is not feasible to send every LRO to ALROC or a TLEC, so exercising should be explored. A regular exercise offers the opportunity to rotate LROs through experienced-based training and provide a laboratory for the development and testing of logistics concepts.

Recommendations for Future Research

Adaptive Basing KSAs

The three competencies for AB concepts of integrated basing, flexible operations, and rapid scalability are extremely broad. Each of the KSAs identified under these competencies may be better referenced as competencies themselves, as each may have several tasks, knowledge, or technical references associate. Future research should be done to determine if the KSAs referenced in this research can be treated as competencies. If so, KSAs for those new competencies will need to be identified.

Senior Captain LRO Availability to Support AB Concepts

LROs fill a large and diverse set of permanent assignments across the Department of Defense. The current career path encourages two base-level assignments followed by a career-broadening assignment. This path diverts senior Captains from the tactical level to gain critical operational, strategic, Joint, and other experience and education. As requirements for AB grow, a study on the current placement and recommended posture for personnel that will most likely be needed to support would be beneficial.

Combat Support Weapons School (CSWS)

In Chapter 4, it was noted that while the LRO functional area of Logistics Planning includes the implementation of efficient combat support operations, there may be a desire to shift the integration responsibilities to another career field or add the role to other career fields. If this were to happen, a training course to build the AB competencies necessary that brings together all career fields involved might be of value.

Summary

This study explored the competencies required for the successful employment of AB concepts and compared them with training currently available to the LRO career field. Additionally, interviews with key leaders in the LRO community helped identify gaps in the experience. Ultimately, the study found that the gaps that exist can be addressed through adjustments to the current training course and providing additional experiential opportunities throughout the early years of an LRO's career.

Appendix A

21R Career Field Education and Training Plan

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14. ABSTRACT

This research examines Air Force Logistics Readiness Officer (LRO) training compared to core competencies identified in Adaptive Basing (AB) concepts. This qualitative research utilizes both comparative analysis and interviews to determine if the current formal training is in line with the known requirements for AB concepts. Additionally, should there be gaps in training identified, the research seeks to identify additional training options to aid in the success of the USAF and its LROs.

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