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Study on the Air Force's Ability to Field Senior Logistics Readiness Officers Experienced in Fuels Management

Keith A. Lewis

A STUDY ON THE AIR FORCE'S ABILITY TO

FIELD SENIOR LOGISTICS READINESS

OFFICERS EXPERIENCED IN FUELS

MANAGEMENT

THESIS

Keith A. Lewis, Captain, USAF

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DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

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Keith A. Lewis, BS

Captain, USAF

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Keith A. Lewis, BS
Captain, USAF

Approved:

______________//signed//______________ ____________
Marvin A. Arostegui, Lt Col (USAF) (Chair) date

______________//signed//______________ ____________
Bradley E. Anderson, Maj (USAF) (Member) date

AFIT/GLM/ENS/05-14

Abstract

The Chief of Staff of the Air Force Logistics Review (CLR) of 1999 was an extensive improvement effort designed to examine a multitude of base-level logistics process issues and their resulting impact on organizational structures. A major initiative resulting from the CLR was the development of the logistics readiness officer (LRO) career field, which combined three previous logistics fields; supply/fuels, transportation, and logistics plans. As a result, the training for a LRO is extensive, promoting logistics function familiarity rather than expertise. This is of particular concern in the critical area of fuels management. Fuel is an absolute necessity in any military operation and its proper management is paramount to mission success.

The objective of this research is to determine the impact of changes due to the LRO career field implementation on the Air Force's ability to field LROs with fuels management experience. An interview questionnaire with officers with advanced fuels position experience identified the requirements of advanced fuels positions. Spreadsheet models were used to predict the Air Force's ability to fill advanced fuels positions in the future from a manning perspective.

The results of this research indicate the Air Force will be able to fill advanced fuels positions from a manning perspective. However, the interview results indicate that LROs in the future will not possess the experience or education required to fill advanced fuels positions. The results presented in this research provide insight to Air Force senior leaders on how to manage the important resource of logistics officers with fuels management expertise.

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Keith A. Lewis

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A STUDY ON THE AIR FORCE'S ABILITY TO FIELD SENIOR LOGISTICS READINESS OFFICERS EXPERIENCED IN FUELS MANAGEMENT

I. Introduction

General Issue

Today's environment is characterized by unstable global security. The United States Air Force must be able to get the right information, right supplies, and right people to the right place at the right time. To do this, the Air Force must capitalize on expertise in critical functional areas. One such area is that of fuels management. Fuel is an absolute necessity in any military operation and its proper management is paramount to mission success. This research focuses on Air Force logistics readiness officers and the identification of the requirements necessary for these officers to fill advanced positions within the fuels discipline, so that both the requirements and the officers may be properly valued, managed, and cultivated.

Background and Overview

The Air Force continually strives to improve performance and streamline organizational structures in response to ever evolving world threats. One of the more recent and extensive improvement efforts was the Chief of Staff of the Air Force

Logistics Review (CLR). The CLR began in the Fall of 1999 with the purpose of examining a multitude of base-level logistics process issues and their resulting impact on organizational structure. This review postured the Air Force to further enhance the way it produces and delivers air and space power in the expeditionary, rapid reaction, contingency-based world environment of today and in the future (HQ USAF, 2002b).

A major initiative resulting from the CLR was the development and implementation of the logistics readiness officer (LRO) Air Force Specialty Code (AFSC), 21RX. The career field combined three previous logistics AFSCs; supply/fuels, transportation, and logistics plans under what is known as the logistics readiness squadron. The overall objective of this initiative is to develop senior-level logisticians that can merge logistics experience, doctrine, and resources to provide operational support to the warfighter in the expeditionary environment (HQ USAFR, 2002).

This demands the development of logistics officer leadership skills and technical expertise in supply, logistics plans, transportation, and the Joint Operation Planning and Execution System through a combination of mandatory education, training, and certification programs centered on logistics core competencies (Hall, 2001). However, developing this technical expertise poses a formidable obstacle considering the training environment for the LRO.

By combining three logistics disciplines, the training for an LRO has become both extensive and expansive in the technical areas of each discipline and in the time required for training. The LRO is expected to become qualified in three core competencies which encompass six proficiencies. The core competencies are distribution, material management, and contingency operations. The six proficiencies are material management, distribution management, contingency operations, fuels management, aerial port operations, and vehicle management. It is expected to take approximately six or seven years for a LRO to become fully qualified. Qualified means an officer must complete the LRO basic course and complete at least 12 months in a proficiency within each of the three core competencies (Department of the Air Force, 2002). The LRO does not have to learn each proficiency within each competency to become a qualified LRO. This training path has the potential to lead to a lack of experience and expertise within a particular proficiency, particularly in the highly technical fuels discipline.

By becoming qualified in the fuels management proficiency of the material management core competency, a LRO is awarded the fuels management special experience identifier (SEI) code. The SEI code identifies an individual in the personnel data systems as having special training, experience, and competence within a particular field, which marks them as candidates for unique positions, contingency operations, or advanced positions within the applicable discipline (Department of the Air Force, 2002).

A LRO, who received the fuels management SEI by working in the fuels management flight for 12 months during his or her first assignment, could potentially be selected for an advanced fuels position years later in his or her career despite no fuels experience since that first assignment. This brings to the forefront the dilemma of having qualified LROs per the training requirements outlined in the training plan, versus LROs truly possessing the experience, education and training necessary to fill advanced positions within the fuels discipline.

The fuels officer career field has changed over time. Once a stand alone career field, there has not been a dedicated fuels officer career field since around 1980, when the career field was combined with that of supply officers. The fuels discipline, which had been aligned under the umbrella of the supply squadron for years, became truly a subspecialty of supply (Pittman, 2001). Therefore, supply officers were tasked with learning the fuels discipline in addition to the functions of the supply specialty. Officers were regularly rotated from section to section within the squadron, often eliminating the opportunity for an officer to gain the experience and training necessary to become competent in the fuels area. If officers were allowed to stay in fuels for a substantial period, subsequent assignments were in other areas of supply; therefore perpetuating the loss of expertise. Now, with the implementation of the LRO career field, officers have many more functions in which to become proficient. Therefore, the opportunity to become truly proficient in the fuels discipline is convoluted even further.

Throughout the history of the Air Force, the operations of the fuels organizations played a vital role in both peacetime and during war. By understanding the importance of fuels management expertise to mission accomplishment, the Air Force can establish methods to 'grow' fuels professionals.

Problem Statement

How important is it to have fuels management expertise in the Air Force? Fuel is a critical staple to every operation undertaken by the Air Force. Fuels management expertise promotes the safe, effective, and efficient allocation of a critical resource. This, in turn, enhances mission accomplishment. To develop and maintain fuels management expertise, the requirements for advanced fuels positions must be identified.

Investigative Questions

- What education and training is required for a LRO to fill advanced positions within the fuels discipline?
- What practical experience is required for a LRO to fill advanced positions within the fuels discipline?
- How can the requirements of advanced positions within the fuels discipline be met?
- How well does the current training plan prepare LROs to meet the requirements necessary to fill advanced positions within the fuels discipline?
- Will there be enough LROs to fill advanced positions within the fuels discipline with experienced officers?

The investigative questions will be answered through: 1) semi-structured telephone interviews and/or electronic mail correspondence with Air Force officers serving in advanced fuels positions 2) spreadsheet models to predict the Air Force's ability to fill advanced fuels positions with LROs in the future.

Research Objective

The objective is to determine the impact of the changes due to the LRO career field implementation on the Air Force's ability to continue to field senior logistics officers with fuels management experience. The first step is to identify the requirements for advanced positions within the fuels discipline and how they can be met. This is accomplished through interviews with personnel serving in, or having served in advanced fuels positions and the subsequent analysis of their responses. Next, spreadsheet models examine the Air Force's capability to fill advanced fuels positions in the future from a manning perspective. These results combined with the analysis of the interview responses provide information about the research objective.

Research Methodology

This study was completed in two phases. In the first phase, the fundamental research methodology involves the use of semi-structured telephone interviews and electronic mail correspondence. The interviews were conducted among officers filling advanced fuels positions, or having previously filled advanced fuels positions. An analysis was performed to evaluate the interview responses. The second phase was completed through the use of spreadsheet models. Models were developed to determine the impact of the LRO career field implementation on the Air Force's ability to fill advanced fuels positions with experienced officers.

Scope of Research

This research is limited to the fuels discipline within the Air Force. Within the Air Force LRO career field, the research is limited to those officers serving in, or having served in advanced fuels positions. Additionally, this research is limited by the short period of time that has elapsed since the inception of the LRO career field. Consequently, the long-term effects of the implementation of the LRO career field on advanced fuels positions has yet to truly be experienced in the field.

Relevance

This topic is relevant due to the dynamic and diverse nature of the LRO career field. The implementation of this career field impacts fuels management, a critical function within the logistics arena. This study addresses those impacts; therefore Air Force senior leaders can make educated decisions on how to manage the important resource of officers with fuels management expertise.

Outline of Thesis

This thesis is divided into the following five chapters: Introduction, Literature Review, Methodology, Findings and Analysis, and Conclusions and Recommendations.

Chapter 1: Introduction – This chapter discusses the background, focus of research, research objectives, and relevance of this thesis study.

Chapter 2: Literature Review – This chapter begins with a definition of advanced positions and the evolution of the logistic readiness squadron and the fuels officer career field. Next, the LRO qualification process is described followed by an explanation of the LRO career path. Then, training and development concepts and processes are presented. Finally, career movement and its components are explained.

Chapter 3: Methodology – This chapter begins by describing the method selected to gather information on the requirements of advanced fuels positions. Next, questionnaire development is explained. Then, the identification of the selected participants is discussed followed by justification for using the telephone/electronic mail interview as a tool for identifying the requirements of advanced fuels positions. Finally, the process and justification for using spreadsheet modeling is provided.

Chapter 4: Findings and Analysis – This chapter presents the results of the questionnaire. Common themes found throughout the questionnaire responses are described. Finally, the results of the spreadsheet models are presented.

Chapter 5: Conclusions and Recommendations – This chapter reviews the research results. The relevance of the research effort is presented. Recommendations for future research are provided.

II. Literature Review

Introduction

The purpose of this chapter is to provide a thorough review of the literature relevant to this research effort. Initially, this chapter provides a definition of advanced positions for the purpose of this research. This chapter then summarizes the 21RX Air Force Specialty Code (AFSC) and the evolution of the Logistics Readiness Squadron. This chapter presents a historical review on the evolution of the fuels officer career field. This is followed by a description of the LRO qualification criteria and process. Subsequently, it presents the LRO career path. A review of LRO training and development is presented, which includes a discussion on training needs assessment. Additionally, this chapter examines the concept of career movement. Within the discussion of career movement, this chapter defines career, introduces career path characteristics, and presents a career movement model.

Definition of Advanced Positions

The purpose of this research is to determine the impact of the changes due to the LRO career field implementation on the Air Force's ability to continue to field logistics officers with fuels management experience to fill advanced fuels positions. For this study, advanced positions are defined as those fuels positions above the base level fuels management officer. More specifically, advanced positions are fuels positions at major commands (MAJCOM), Air Staff, Joint Petroleum Offices (JPO), Air Force Petroleum Office (AFPET), and Defense Logistics Agency (DLA).

Air Force Specialty Codes

Personnel Employment assigns an AFSC to every officer and airman in the United States Air Force. An officer AFSC is a combination of numbers and alpha characters used to identify the officer's career field. The first two numbers identify the utilization field. The third digit, which is an alpha character, identifies the functional area within the utilization field identified by the first two numbers of the AFSC. The fourth character, which is numeric, designates the qualification level of the officer. For example, the AFSC 21R3 is explained as follows: the 21 specifies the logistics utilization field, the R identifies the functional area of logistics readiness, and the 3 designates the officer as being fully qualified. The AFSC in which an officer is best qualified to perform is known as the primary AFSC. An officer may be called upon to perform duty outside of his or her primary AFSC. When this occurs the officer is assigned a duty AFSC to identify the specialty in which he or she is performing duty (Department of the Air Force: 2001). The Logistics utilization field includes all functions performed by logistics officers to include the following: aircraft, missile and spacelift maintenance, supply, transportation, and logistics plans. AFI 36-2105 summarizes the Logistics Readiness specialty, 21RX, as follows:

> Integrates spectrum of the logistics processes within the operational, acquisition, and wholesale environments. The major logistics processes include distribution, materiel management and contingency operations. Directs and manages distribution management, materiel management, contingency operations, fuels management, airlift operations, and vehicle management. Plans and programs logistics support for wartime requirements (Department of the Air Force, 2004).

With this wide spectrum of responsibilities, LROs must be flexible and knowledgeable in all functional areas to perform effectively. This knowledge begins at the base level in the logistics readiness squadron (LRS).

Logistics Readiness Squadron

Logistics has become a set of highly-integrated processes and an organization is needed to be responsible for logistics deployment, material management, and distribution processes. Thus, the LRS was formed to develop an organization that best supports in-garrison, transition, and deployed warfighting operations. The LRS evolved through the merger of the supply and transportation squadrons and the addition of the logistics plans function. The vision was to streamline processes, eliminate duplication, and maximize benefits through technology (Hall, 2001). The LRS is comprised of six flights: Distribution; Readiness; Management and Systems; Traffic Management; Vehicle Management; and Fuels Management. The organizational structure of the typical LRS is shown in figure 1 on the next page. The LRS is responsible for overall direction of base logistics processes involving vehicles, equipment, supplies, cargo movement, deployment functions, logistics plans, personal property, passenger movement and fuels (Barker, 2003). This multi-functional construct provides the primary training environment for the LRO. The expected end result from gaining experience, coupled with training and education, in such a diverse environment is that talented and valuable officers will materialize, prepared for leadership positions in the expeditionary Air Force (HQ USAF, 2002a). Diversity was not always the working environment for the fuels officer.

History of the Fuels Officer

During the 1950's through the 1970's, the fuels officer was designated by a specific AFSC, 63XX. In an initiative to improve the career opportunities of fuels

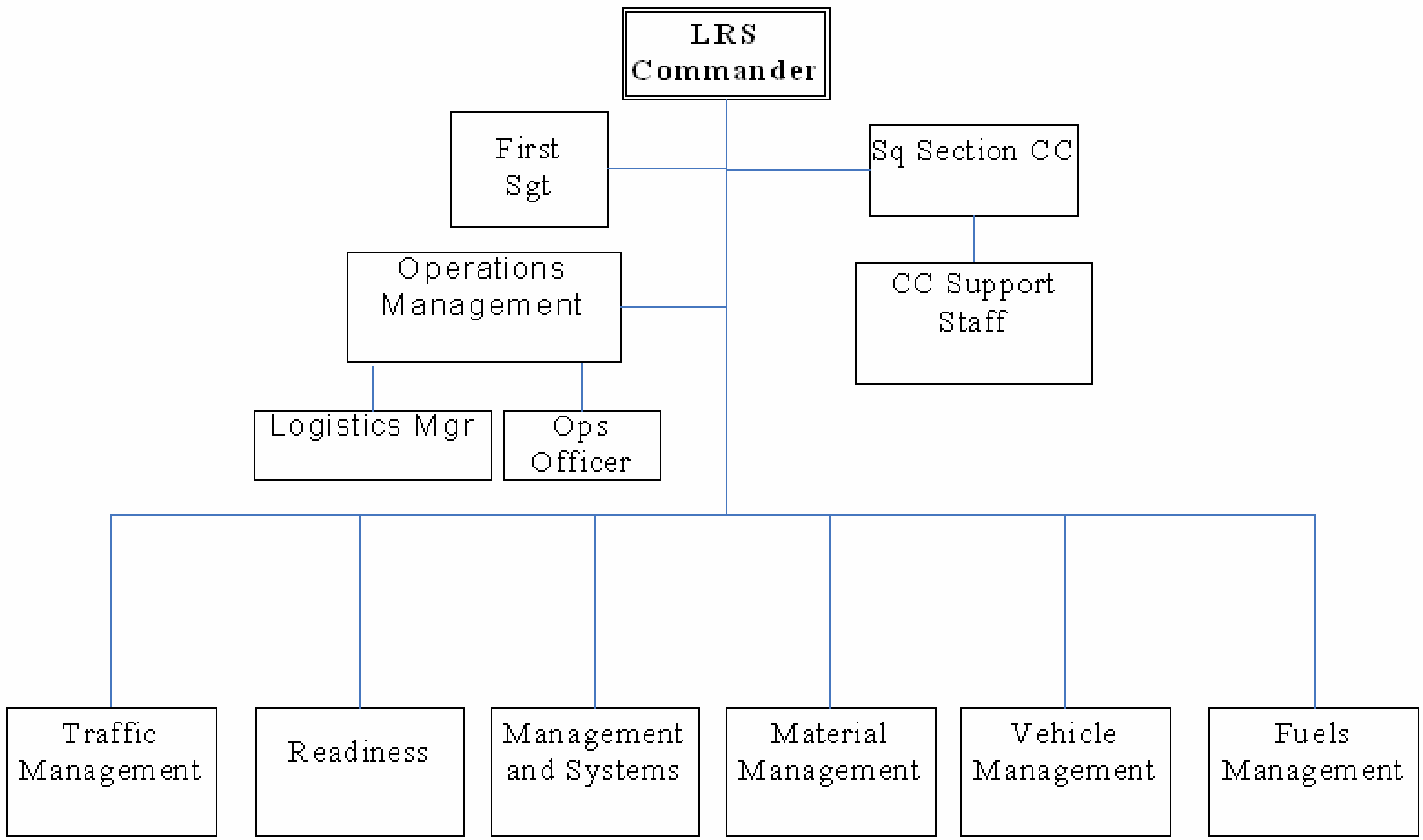

Figure 1. Logistics Readiness Squadron Organizational Structure (LRO Handbook: 2003)

officers, supply officers and field grade fuels officers were consolidated under one AFSC, 6416, in April of 1977. The AFSC of company grade fuels officers was also changed from 6324 to 6434, thereby placing it under the supply career field. This allowed career broadening opportunities for both supply and fuels officers; supply officers could obtain experience in the fuels arena while fuels officers could experience the many facets of base supply. Furthermore, this opened the door for fuels officers to possibly fill squadron commander positions, which were previously unavailable (Spackman, 1985).

In the early 1990's, the AFSC for supply/fuels officers was re-designated as 21SX. Then on 1 November 2002, the LRO career field was implemented, combining the supply (21S), logistics plans (21G), and transportation (21T) career fields under the LRO career field designated as 21R. This further increased the focus on breadth of experience as opposed to depth, where technical expertise can be attained.

This initiative forced the fuels officer to gain experience in the many areas of not only supply, but transportation and logistics planning as well. This greatly increased the training responsibility for the LRO without decreasing his/her responsibility when filling the fuels management officer (FMO) position. The FMO is appointed by the squadron commander as the accountable and responsible officer for the base fuels account (Department of the Air Force, 1996a). As the responsible officer, the FMO must be proficient in fuels management and is responsible for the care and safeguarding of the petroleum product inventories. Also, the FMO ensures accountable records are maintained and required reports are generated (Department of the Air Force, 1999).

Logistics Readiness Officer Qualification Process

A highly trained and motivated officer corps is the key resource for the Air Force to meet the challenges of the future. An important result of combining the three aforementioned logistics disciplines is that the training for an LRO has become expansive in not only the technical areas of each AFSC, but in time as well. To organize this training, the LRO Career Field and Education Plan (CFETP) was developed. The CFETP is a comprehensive, multipurpose document encapsulating the entire spectrum of education and training for a career field. It outlines a logical growth plan and identifies training resources. The growth plan is designed to make training identifiable, non-repetitive, and economically feasible. It also aids in identifying what training and/or education should be accomplished at certain points in a LRO's career (Department of the Air Force, 2002).

The LRO specialty integrates logistics processes within the operational, acquisition, and wholesale environments. The major logistics processes define the logistics readiness core competencies of material management, distribution, and contingency operations. These core competencies encompass six proficiencies. The six proficiencies are as follows: material management; distribution management; contingency operations; fuels management; aerial port operations; and vehicle management (Barker, 2003).

The LRO is expected to become qualified in the three core competencies. It is expected to take approximately six or seven years for a LRO to become fully qualified barring extenuating circumstances such as deployments, special duty assignments, or any other unforeseen interruption to training. This basically allows the LRO approximately two years to become qualified in each competency. Qualified means an officer must complete the LRO basic course (technical school) and complete at least 12 months in a proficiency within each of the three core competencies.

Meeting the time requirements is mandatory but not sufficient for gaining proficiency in a core competency. The LRO must also develop and demonstrate detailed knowledge required for award of a special experience identifier (SEI) code (Shirriff, 2003). The SEI code identifies an individual in personnel data systems as having special training, experience, and competence within a particular field. SEIs complement the assignment process by marking individuals as candidates for unique positions, contingency operations, advanced positions within the applicable discipline, or to meet other management needs. The officer SEI is a three character code. The first character is an activity code and the last two characters identify an experience set. For example, the fuels management SEI is LKY with the 'L' representing the logistics domain and the 'KY' identifying fuels management as the experience set (Department of Air Force, 2004). Figure 2 represents a LRO training timeline and identifies the three core competencies and the respective proficiencies/SEIs of each. Officers are available for deployment after completion of one core competency based on the SEI awarded. At a minimum, officers must gain one SEI in each of the three core competencies (Department of the Air Force, 2002). For example, a LRO may earn the SEIs for material management, fuels management, and vehicle management, yet he/she is still not considered fully qualified because only two of the core competencies are covered (material management and fuels management are both under the material management core competency). Becoming a qualified LRO is the initial milestone as officers head down the LRO career field path.

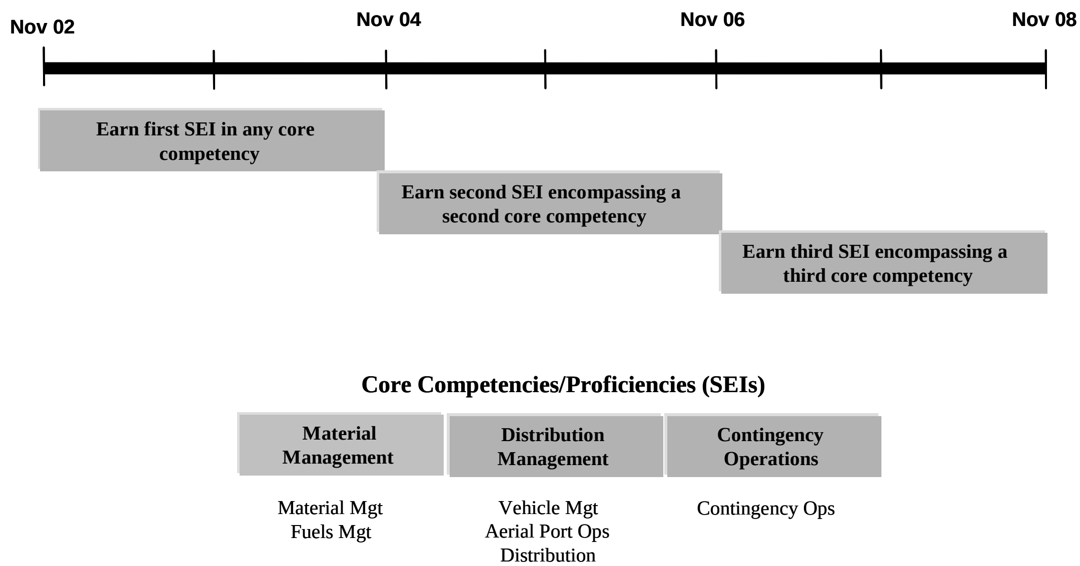

Figure 2: LRO Qualification Timeline

LRO Career Path

Different types of assignments are recommended during an officer's career; however, the officer must gain the necessary depth and breadth of experience to improve performance and the potential for increased responsibility warranted by assignments at different levels (Department of the Air Force, 1996b). An important role in the Air Force's ability to accomplish its mission is adequate education and training and timely progression from entry level officer to staff officer skill level. Education and training is not restricted solely to the technical aspects of the career field, but includes professional military education (PME), special duty, and advanced educational opportunities as well (Department of the Air Force, 1996b).

Upon completion of the LRO basic course, officers enter formal on-the-job training which leads to qualification in the three logistics readiness core competencies. Once fully qualified, officers, usually from lieutenant through senior captain, enter continuation training to broaden their experience base. Besides wing level positions, fully qualified LROs may be assigned to numbered Air Force (NAF) or MAJCOM staff positions. Also, they may be considered for special duty assignments, the Air Force Intern Program, or other career opportunity programs such as the Logistics Career Broadening Program. As LROs transition from company grade officers (CGO) to field grade officers (FGO), they can expect to fill positions at both the wing level or higher. At wing level, LROs may fill positions such as squadron operations officer or aerial port operations officer. At higher levels, LROs may fill staff positions at NAF, MAJCOM, Air Staff, and joint assignments. Once in the field grade officer ranks, LROs can still fill wing level positions. These include the squadron operations officer for large squadrons, squadron commander, or deputy mission support group commander. Also, LROs may fill positions at all levels above the wing to include joint staff assignments and positions within DoD agencies (Department of the Air Force, 2002).

Figure 3 depicts the LRO career path pyramid. It identifies where an LRO may be assigned during his/her career and the grade expected to be eligible for that duty as an LRO. The various levels of PME, special duty, and advanced academic opportunities along with the appropriate time frames for each are also identified. In some cases experience, training, and education may play a vital role in assignment determination. From the pyramid, it is obvious that as rank increases so does the opportunity for higher level positions which entails increased duties, responsibility, and accountability;

henceforth, training needs should increase as well. At this time it is appropriate to associate how this corresponds to training needs assessment and career advancement within typical organizations of the private sector.

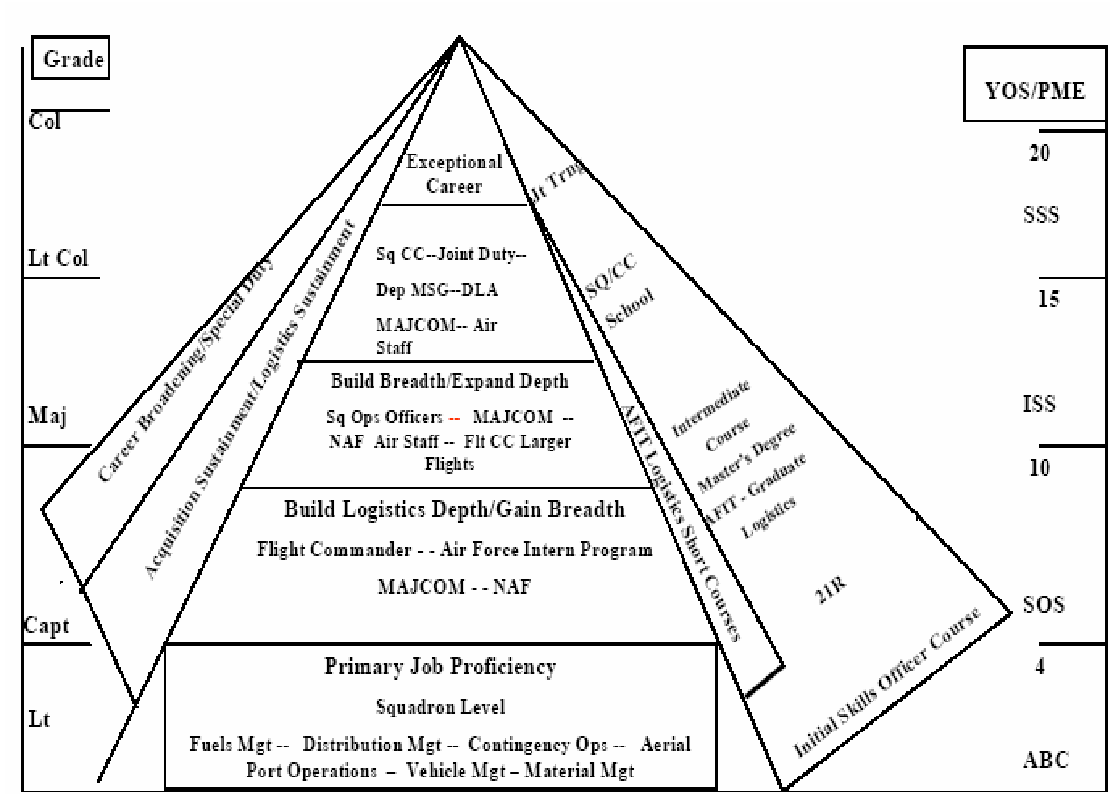

Figure 3. Logistics Readiness Officer Career Path Pyramid (Barker, 2003)

Training and Development

There are several different opinions as to the definition of training and development. For example, Wayne Cascio claims, "Training consists of planned programs designed to improve performance at the individual, group, and organizational levels. Improved performance, in turn, implies that there have been measurable changes in knowledge, skills, attitudes, and/or social behavior" (Cascio, 2003). Ivancevich and

Glueck state that training and development "is, in short, an attempt to improve current or future employee performance" (Ivancevich and Glueck, 1983). Their definition is based off the following factors: training, management development, formal training program, and learning. These factors are described below.

> *Training*: the systematic process of altering the behavior of employees in a direction to increase organizational goals.
>
> *Management development*: the process by which managers gain the experience, skills, and attitudes to become or remain successful leaders in their organizations.
>
> *Formal training program*: an effort by the employer to provide opportunities for the employee to acquire job-related skills, attitudes, and knowledge.
>
> *Learning*: the act by which the individual acquires skills, knowledge, and abilities which result in a relatively permanent change in his or her behavior. (Ivancevich and Glueck, 1983)

Based on a survey of corporate training and development practices, Cascio (2003) found that four characteristics distinguished companies with the most effective training and development practices. These characteristics are listed below.

> Top management is committed to training and development; training is part of the corporate culture.
>
> Training is tied to business strategy and objectives and is linked to bottom-line results.
>
> A comprehensive, systematic approach to training exists; training and retraining are done at all levels on a continuous, ongoing basis.
>
> There is a commitment to invest the necessary resources, to provide sufficient time and money for training. (Cascio, 2003)

All of the authors seem to agree that training and development play a major role in the vitality of any organization. With the training and its associated key factors defined and the vital characteristics to effective training practices established, how do these relate to the development of the officer corps, particularly the highly diverse LRO career field in meeting challenges of the future?

Development of the LRO

If the Air Force is to meet present and future challenges, the officer corps must be efficiently and effectively trained. Within the Air Force as an organization, this pertains to the unit positions, staff level positions at the different levels, and other joint/advanced positions. From an organizational perspective, the goal of training and developing LROs is to enhance the organization's ability to attain its goals. From an individual perspective, training is accomplished through a formal training program in the form of a technical school to build knowledge, skills, and attitudes for the LRO to initially perform a job. This is followed up with a formal on-the-job training program to enhance his or her ability through qualification procedures to perform a more specific job more effectively, both short-term and in the future (Department of the Air Force, 2002).

As the LRO gains rank and changes positions commensurate with that rank, the training and development takes a more managerial development approach rather than focusing primarily on the technical aspects of the career field (Department of the Air Force, 2002). However, due to the diverse nature of the LRO career field, an officer can be removed from his or her area of expertise for quite some time, perhaps years, and then be called upon to fill a managerial position for that area. For example, an LRO may have been the FMO at his or her first base for 18 months. The LRO could spend six years in different functional/special areas and then be assigned to a MAJCOM fuels officer position without any retraining in the fuels arena. To perform effectively, the LRO needs to understand both the technical and practical aspects of the job as well as the managerial responsibilities. If the Air Force trains and develops its logistics readiness officer corps to meet the same basic goals as the corporate world, then it makes sense for the Air Force to look to the civilian sector for ideas to meet these goals.

Training Needs Assessment

One way civilian corporations attempt to enhance their ability to meet organizational goals is through training needs assessment. In general, it is important to analyze training needs with the organizational objectives and strategies clearly in mind. This helps prevent wasted time and money on training programs with little or no return on investment for the organization. If training needs cannot be related to the achievement of organizational goals, then the training is probably unnecessary. There are three levels of analysis for assessing training needs. These levels are described as follows:

> *Organizational analysis*: focuses on identifying where within the organization training is needed.
>
> *Operations analysis*: attempts to identify the content of training; what an employee must do in order to perform competently.
>
> *Individual analysis*: determines how well each employee is performing the tasks that make up his or her job. (Cascio, 2003)

Training needs may surface in any of these three categories. When assessing training needs, managers often find it helpful to use a model as depicted in Figure 4. Initially an analysis of the external and internal environment of the organization is necessary. This includes, but definitely not limited to, such areas as business strategies, union activity, safety concerns, and personnel behavior. The next step is to ask the question, "Will training produce changes in employee behavior that will contribute to our organization's

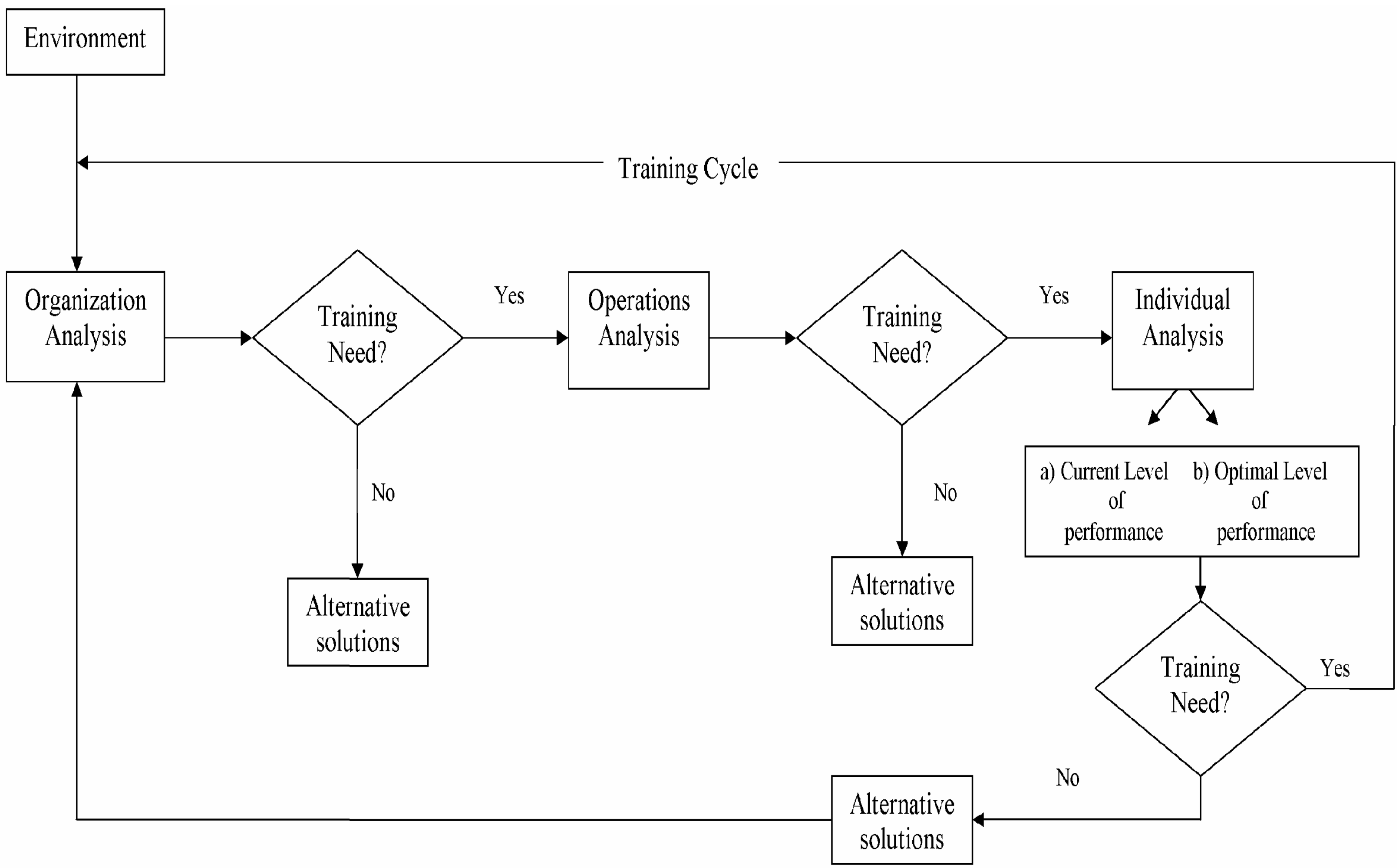

Figure 4. Training Needs Assessment Model (Cascio: 2003)

goals?" After all, training should contribute to the attainment of organizational goals (Cascio, 2003). Next, operational analysis takes place. This involves collecting information on how work is done, so that standards of performance can be established. Then, the competencies necessary for effective task performance are identified. Finally, individual analysis is necessary. This involves the determination of whether or not the individual has the experience, knowledge and skills necessary to perform to or above the standards set forth in operational analysis (Cascio, 2003).   The Air Force employed a training needs assessment to determine the knowledge and skills required for logistics readiness entry level officers as evident by the development of the 21RX CFETP. However, as noted earlier, the LRO qualification process is very expansive. This raises two important issues. First, there is no formal training program per se for an advanced fuels position. Secondly, developing expertise in a specific area of logistics readiness becomes inherently difficult. Therefore, the Air Force should look to the concept used by a typical civilian organization when considering career advancement.

Career Movement

Organizations generally provide their employees with the opportunity for advancement as the employees' careers progress. Similarly, the LRO is also afforded career advancement. There are both fundamental similarities and differences between the characteristics of the advancement processes between a typical civilian organization and the LRO career field. It is appropriate to define the word career then discuss the characteristics of the career path, and finally present a model of career movement in organizations.

Career Defined. Hellriegel, Slocum, and Woodman (1983) define career as "the sequence of work-related positions occupied by a person during the course of a lifetime." This definition is widely accepted by several authors of human resources and organizational behavior textbooks. Traditionally, career success was defined in terms of occupational advancement, which could easily be measured (Cascio, 2003). Hellriegel et al. (1983) support the idea that career success is best determined by the individual and is more related to the concept of self–actualization rather than occupational advancement.

Career Path Characteristics. Career paths represent logical and possible sequences of positions that could be held, formed by analyzing what an individual does in an organization. Characteristics of career paths are listed below.

> Career paths should:
>
> Represent real progression possibilities, lateral or upward, without implied normal rates of progress or forced specialization within a technical area.
>
> Be tentative and responsive to changes in job content, work priorities, organizational patterns and managerial needs.
>
> Be flexible, taking into consideration the compensating qualities of those who influence the way work is performed.
>
> Specify the skill, knowledge, and other attributes required to effectively perform at each position along the path and specify how they can be acquired. (Cascio, 2003)

The LRO career path indeed has both similarities and differences in relation to these career path characteristics. Undoubtedly, some of the differences are inherent to the military construct. However, the glaring difference is that the LRO career path lacks the specification of the skills, knowledge, and other attributes required to effectively perform in advanced positions, and how they can be acquired. This could be troublesome in the future for LRO promotion potential. According to the Air Force Officer Promotion

Program, the most important indicator of potential is job performance (Department of the Air Force, 1997). At this time it is necessary to describe the types of movements within an organization.

Model of Career Movement. In an organization, there are three dimensions along which career moves can be made; vertical, horizontal, and inclusion. The vertical dimension refers to the increases or decreases in the formal rank of personnel in the organization. The horizontal dimension represents the movements from one functional or technical area to another. The inclusion dimension represents movement to the core of the organization. Inclusion movements occur as employees become very trusted and are consulted on important matters; however, vertical or horizontal movements do not have to occur for inclusion to take place (Hellriegel et al, 1983). Figure 5 combines the three dimensions.

The potential movements depicted in Figure 5 appear similar to those of an LRO. However, there are some major differences in the processes. In civilian organizations an employee can stay in a position for several years, often mastering a technical area before being promoted. An LRO at base level is rotated among several positions covering diversely different technical areas. Familiarization with functions becomes the norm rather than mastering the functions. This is contradictory to part of the criteria used to select Air Force officers for promotion. The criteria state that lieutenants and captains should concentrate on depth of experience rather than breadth (Department of the Air

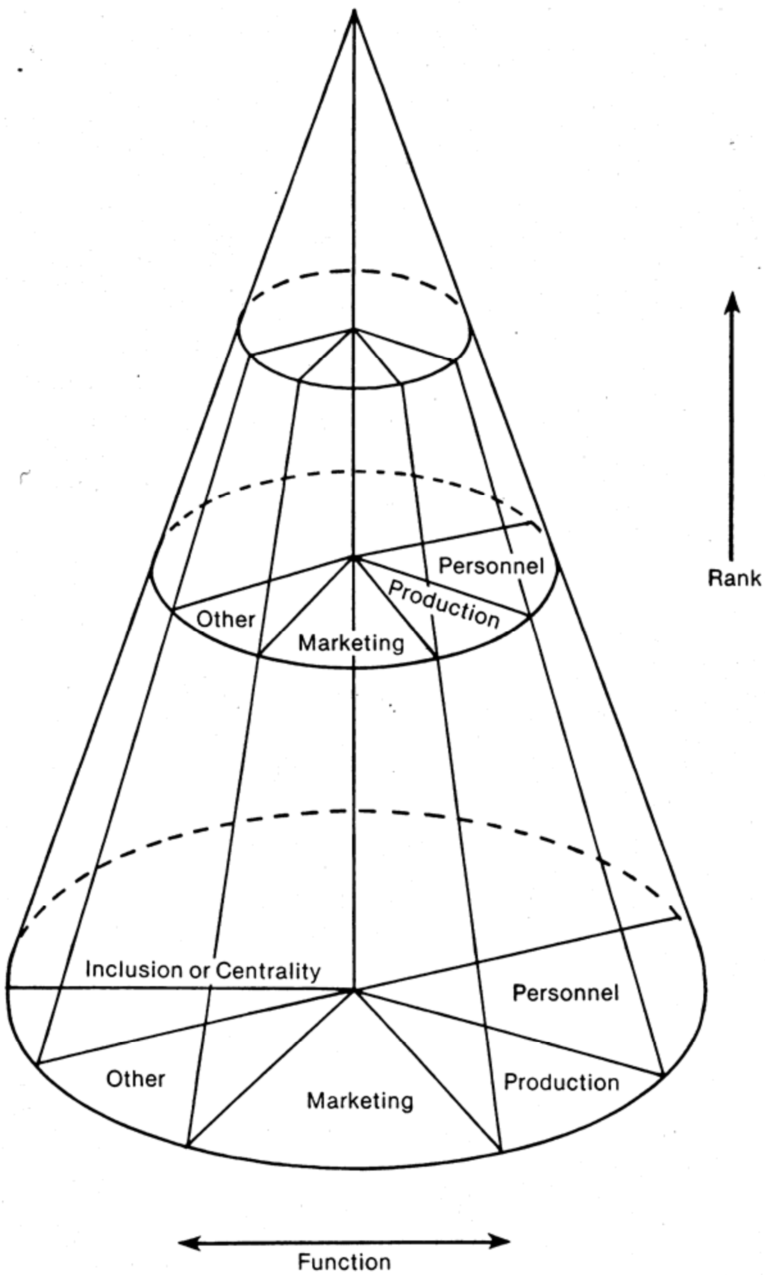

Figure 5. Model of Career Movement in Organizations (Hellriegel et al: 2003)

Force, 1997). If it takes up to six or seven years for an LRO to attain qualification, the ability to truly obtain depth is in question.

A civilian employee may be transferred to another location, similar to an Air Force permanent-change-of-station. However, if the move is a vertical promotion, the estimated time to get up to speed on their new duties is 9 months; 7.8 months for a lateral move (Cascio, 2003). Due to the frequency of moves for LROs and the diversity of jobs that he or she may fill as a result of those moves, getting truly up to speed may be extremely difficult. This is of great concern in a logistics functional area as critical as fuels management. There appears to be much more of an opportunity to develop technical and functional experts in the civilian organization system.

Finally, being promoted as an Air Force officer often dictates and/or limits the options for future positions. Future positions are not necessarily contingent upon previous positions. In the civilian organization, an employee is promoted into a job normally related to the previous position where his or her skills, knowledge, and attitudes can continue to develop into expertise. Understandably, the Air Force by its very nature mandates different personnel management systems from the civilian sector. However, the need to develop expertise in critical functional areas such as the fuels discipline cannot be denied nor compromised. The safe, efficient, and effective management of fuels can be the difference between mission accomplishment and mission failure.

Chapter Summary

Once a stand alone AFSC, Air Force fuels officers were absorbed first into the supply career field. Then, most recently, supply officers were absorbed into the logistics readiness career field. Logistics readiness officers at base level are aligned under a usually large organization known as the logistics readiness squadron. The functional areas for LROs extend far beyond those of just the fuels discipline, encompassing three core competencies and six proficiency areas.

The LRO training and qualification process is extensive. Career field managers expect qualification to take up to six or seven years, providing the LRO with an experience level of about one year in each proficiency. This poses a significant concern that expertise within functional areas, particularly the fuels discipline, is not possible. Per their career path, LROs assume advanced positions as they gain rank. However, the experience and expertise required to perform effectively in these advanced positions can lag behind.

The training and development of the LRO from a technical perspective really only occurs at the base level. Then training takes a more managerial approach focusing on leadership and officership. Technical training needs assessments should be held at each level to identify the skills, knowledge, and attitudes to perform effectively, thereby promoting organizational goal attainment.

The nature of the military promotes and mandates career movement. The Air Force promotion system and the LRO career path stress breadth and depth in officer assignments. Therefore a LRO is persuaded not to spend too much time in one functional area, such as fuels management. This inherently impedes the capability of an LRO to 'grow' into a fuels expert. Ultimately, the Air Force must decide how to 'grow' these fuels experts. But before that plan can be developed, the Air Force needs to first identify the true requirements of advanced fuels positions then determine how to meet these requirements. Chapter III describes the methodology to identify the requirements for advanced positions within the fuels discipline. It also describes the methodology to predict whether or not the Air Force can field LROs experienced in fuels management for advanced positions within the fuels discipline.

III. Methodology

Introduction

The objective of this research is to determine the impact of changes due to the LRO career field implementation on the Air Force's ability to field logistics officers with fuels management experience for advanced fuels positions. Before this objective can be met, the experience, education, and training requirements for advanced fuels related positions must be identified. This chapter describes the methodologies used for identifying the requirements for advanced fuels positions and for determining the Air Force's capability to field senior logistics officers experienced in fuels management in the future. First, development of the interview questionnaire used for identifying the requirements for advanced fuels positions is discussed. Next, the spreadsheets developed and used by this researcher to determine the Air Force's ability to fill advanced fuels positions in the future are presented and explained.

Identification of Requirement Categories

The first step in identifying the requirements for advanced fuels positions was to determine the categories for the requirements. These categories served as the source from which interview questions could be developed. The source for fuels requirements categories was official Air Force guidance.

Official Guidance. Identifying requirements categories was accomplished through a review of pertinent Air Force regulatory guidance. The Career Field Education and Training Plan, CFETP 21RX, provides a description of the training plan for development within the logistics readiness officer career field. The training plan is further divided into the three core competencies and six proficiencies encompassing the career field. For each proficiency, specific requirements mandatory for award of the applicable SEI are identified. These requirements include training, which includes formal courses, and experience. Therefore, the requirement categories for identifying requirements for advanced fuels positions are 1) training and education, and 2) experience. These categories provided the basis upon which to develop questions for the interview questionnaire.

Questionnaire Development. The interview questions for identifying requirements for advanced fuels positions are open-ended questions. Salant and Dillman (1998) point out advantages of using open-ended questions. First, open-ended questions are excellent for exploring unknown subjects. Also, this type of questions "…give survey respondents a chance to voice strong opinions, vent frustrations, or let researchers know what has been overlooked" (Salant and Dillman, 1998). However, they point out that open-ended questions have several drawbacks as well. One of these drawbacks is that open-ended questions may ask people to recall experiences or discuss issues that they may not have considered in a long time. Also, open-ended questions may produce many different responses with only a few mentions of any one topic (Salant and Dillman, 1998). To address these drawbacks, the first two questions were designed with responses anticipated by the researcher listed under the first two questions. These anticipated responses were used both to facilitate responses and to simplify the recording of responses process. Additionally, unanticipated responses were recorded. The following questions comprised the interview questionnaire:

Question 1:

In your opinion, what education and training is required for a LRO to fill advanced positions within the fuels discipline?

(i.e. formal courses, leadership training, joint courses/training, exercises, advanced degrees, specific tasks, etc)

Question 2:

In your opinion, what practical experience is required for a LRO to fill advanced positions within the fuels discipline?

(i.e. command diversity, assignments, airframe diversity, refueling systems diversity, fuels equipment, fuels positions, years of experience required, years between fuels assignments, deployments, etc)

Question 3:

What steps can be taken so the requirements of advanced positions within the fuels discipline you identified in questions 1 and 2 can be met?

Question 4:

How well does the current training plan prepare LROs to meet the requirements necessary to fill advanced positions within the fuels discipline?

a. Not at all
b. Somewhat Prepares
c. Fully Prepares
d. Over Prepares

These four questions served as the foundation for the interview questionnaire. The questionnaire also included definitions relating to the fuels requirement categories. The purpose of including the definitions was to ensure a consistent explanation to all participants and remove any bias on the part of the researcher during the research process. The following definitions were provided in the interview questionnaire:

Advanced Fuels Position: Fuels positions above the base level fuels management officer.

Education: Knowledge and skills gained through formal instruction or study.

Training: Practice used to develop proficiency in some profession.

Experience: The observing, encountering, or undergoing of things generally as they occur in the course of time (Costello, 1992).

These definitions and the aforementioned interview questions, along with general directions and a description of the purpose of the interview, constitute the questionnaire used in this research effort. A copy of the complete questionnaire is available in Appendix A.

Interview Participants. The next step was to identify participants for the interviews. There are 40 fuels positions in the United States Air Force fitting the definition of advanced fuels positions. Participants were selected from fuels officers filling these positions. The agreed upon sample size was 20 fuels officers. Furthermore, it was decided that these 20 officers should be representative of the different levels of advanced fuels positions. Therefore, participants were sought in the following categories: MAJCOM fuels staff officers, Air Staff, DLA, and Joint Staff. Potential participants were identified from the 2003-2004 Fuels Directory, known as the Blue Book.

After identifying the interview participants, contact was made with each participant via telephone and/or electronic mail. The contact consisted of a general discussion explaining the nature and purpose of the research and the interview questions, and to schedule times for the actual interviews.

Interview Analysis. Upon completion of all of the interviews, the responses were analyzed. The analysis of the interview data was conducted using Creswell's data analysis spiral (Leedy and Ormrod, 2001). This process consists of four steps as depicted in Figure 6.

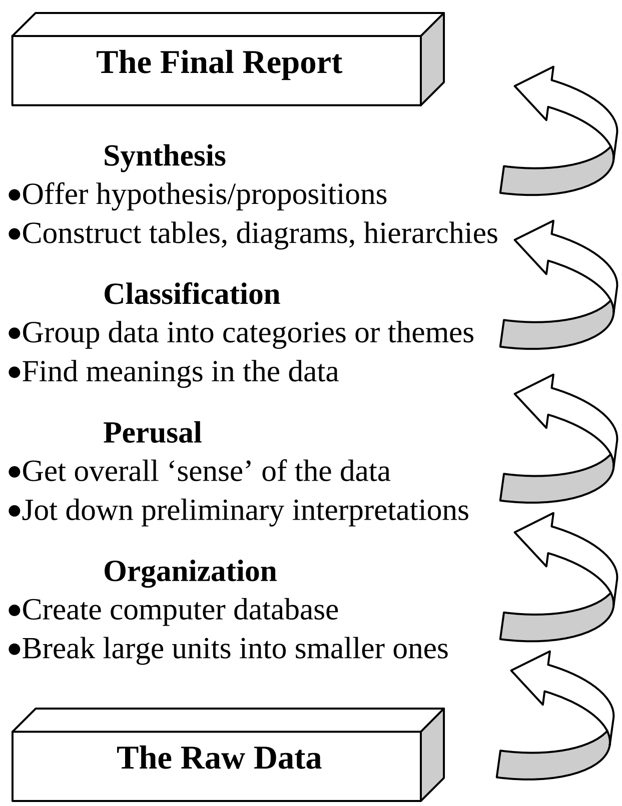

Figure 6. The Data Analysis Spiral (Leedy and Ormrod, 2001)

The first step is organization. This refers to taking the raw data from the interviews and organizing it together in a central location such as a computer database. Larger bodies of text may be broken down into smaller units at this time for manageability purposes.

The second step calls for perusal of the data. The data should be perused several times to get a sense of what it contains as a whole. During this process, notes are taken that suggest possible themes and/or sub-themes.

The third step is classification. This refers to identifying general categories or themes, and perhaps subcategories and sub-themes. This is followed by classifying each piece of data according to the identified areas.

The fourth step involves integration and summarization of the data. This includes offering propositions that describe relationships among the categories. Also, this step refers to packaging the data into an organizational scheme such as a table or figure (Leedy and Ormrod, 2001).

Analyzing the results will be discussed in greater detail in the next chapter. The results of the analysis will be presented in that chapter as well. This analysis was necessary to identify the requirements of advanced fuels positions within the fuels discipline.

Spreadsheet Modeling

Analysis from a manning perspective is necessary to further determine the impact of the changes due to the LRO career field implementation on the Air Force's ability to continue to field logistics officers with fuels management experience for advanced fuels positions. The use of spreadsheets is the chosen methodology for this determination.

The spreadsheets developed are based on historical data obtained through the Air Force Personnel Center at Randolph AFB, Texas. This historical data includes predicted officer accession rates, retention rates, promotion rates, average years of promotion by rank, and the rate at which officers serve in positions outside of their primary career field. For this research effort, completed spreadsheets are termed models for reference purposes.

Initially, spreadsheets were built to predict the Air Force's ability to field LROs experienced in fuels management. More specifically, these spreadsheets provide the predicted number of officers trained in fuels management at the base level, which is a requirement for earning the fuels management SEI. The spreadsheets use simple mathematical calculations based on the aforementioned historical data and the number of FMO positions available.

The fuels management SEI is a requirement for an officer to fill advanced fuels positions. Based on the results and the aforementioned historical data, additional spreadsheets were developed to predict the number of LROs that could fill major and lieutenant colonel billet fuels positions based on the number of authorized positions at these levels. The results of these spreadsheets enabled conclusions to be made about the Air Force's ability to fill advanced fuels positions with LROs experienced in fuels management.

<u>Justification</u>. The spreadsheet modeling methodology was chosen for three reasons. First, using a spreadsheet model is relatively easy to do, particularly with the

computational assistance provided by the software program. Secondly, the output is reasonably easy to understand and interpret for not only the person performing the analysis, but for those presented with the results as well. Finally, the results can often lead to additional and beneficial insight on the issue at hand (Ragsdale, 2004).

Chapter Summary

An interview questionnaire was developed in order to identify the requirements for advanced positions within the fuels discipline. Discussion of the requirements categories, questionnaire development, participant identification, and response analysis provided the reader with information on the key elements for use in the interviews. Then the spreadsheet development and purpose was explained, and justification along with a justification for choosing this method. Chapter 4 presents the results and analysis of the questionnaire and spreadsheet models used in this research effort.

IV. Results and Analysis

Introduction

This research began with the objective of determining the impact of changes due to the LRO career field implementation on the Air Force's ability to continue to field logistics officers with fuels management experience for advanced fuels positions. The first step was to identify the requirements for advanced positions within the fuels discipline and how they can be met. The second step was to use spreadsheet models, based on historical data, to predict the Air Force's ability to continue to fill advanced fuels positions with officers experienced in fuels management.

As described in the previous chapter, the process for identifying the requirements categories for advanced fuels positions began with a review of the 21RX CFETP. From this review, two categories were developed. These categories were: 1) education and training, and 2) experience. These categories represent the institutional belief regarding the foundation upon which to build the knowledge and experience that LROs need to accomplish their jobs.

Five investigative questions were used to guide this research: 1) What education and training is required for a LRO to fill advanced positions within the fuels discipline 2) What practical experience is required for a LRO to fill advanced positions within the fuels discipline 3) What steps can be taken so the requirements of advanced positions within the fuels discipline as identified in questions 1 and 2 can be met 4) How well does the current training plan prepare LROs to meet the requirements necessary to fill advanced positions within the fuels discipline, and 5) Will there be enough LROs to fill advanced positions within the fuels discipline with experienced officers in the future. A total of nineteen interviews were conducted for this research effort. Most of the responses were very detailed. Many of the responses were duplicated among the respondents. This was not surprising. The fuels community is rather small and traditionally tight-knit, with the senior fuels officers often communicating with each other. This chapter will describe the analysis and results from the research efforts accomplished to answer these investigative questions.

Education and Training Requirements

For the purpose of this question, education was defined as the knowledge and skills gained through formal instruction or study. Training was defined as practice used to develop proficiency in some profession. Based on analysis of the responses, the category of education and training was broken down into the sub-categories of formal courses, programs, and exercises as listed in Table 1. The frequencies of all responses as they pertain to the sub-categories are listed in Appendix B.

Table 1: Education and Training Requirements Category

Education and Training
Formal Courses
Professional Programs
Exercises

Formal Courses. Based on the responses, respondents agreed that formal courses are required and play a vital role in developing the LRO to fill advanced fuels positions. The most common responses for formal courses were as follows: Logistics Readiness Officer basic course, Defense Energy Support Center (DESC) courses, the Army Petroleum and Water Course, Contingency Wartime Planning Course (CWPC), Fuels Operational Readiness Capability Equipment (FORCE) courses, and leadership courses. These courses are listed in Table 2 in the order that they were most frequently referenced.

Table 2: Formal Courses Sub-Category

Formal Courses
Defense Energy Support Center (DESC) courses
- Overview Course
- Joint Petroleum Seminar
Petroleum and Water Course
Contingency Wartime Planning Course (CWPC)
Logistics Readiness Officer Basic Course
Fuels Operational Readiness Capability Equipment (FORCE) courses
Leadership courses

It is important to note that fifteen of the respondents stressed the importance of the ability to operate in the joint environment. This theme was emphasized either by addressing a specific joint fuels course or through comments about operating in the joint environment. This perhaps explains why the four most referenced courses are joint in nature. The DESC courses are considered by most fuels officers to be joint in nature as DESC provides fuel support for the entire DoD and requires extensive coordination with other branches of the military as well as civilian agencies. Another joint course, the Petroleum and Water Course sponsored by the Army and conducted at Fort Lee, Virginia was highly regarded by respondents. The majority felt that more training opportunities need to be made available and supported to prepare officers for advanced fuels positions.

Joint planning was mentioned specifically by over half of the respondents. They expressed a need for education and training in this area. As a result, some specifically mentioned the CWPC taught at Air University which emphasizes the importance of planning in the joint environment.

Professional Programs. Closely related to formal courses are the professional programs that the respondents deemed as important for officers filling advanced fuels positions. There were two programs mentioned frequently: Education with Industry and Advanced Academic Degree programs. They are listed in Table 3 in the order that they were most frequently referenced.

Table 3: Professional Program Sub-Category

Professional Programs
Education with Industry (EWI)
Advanced Academic Degree programs (AAD)
- Petroleum Management
- Logistics/Supply Chain Management

Respondents stressed that these programs, whether directly related to the fuels discipline or the logistics arena in general, provide valuable education and training that would enhance an officer's ability to perform in advanced fuels positions.

Respondents felt that more positions need to be made available and supported in these programs. They viewed the Education with Industry program as invaluable due to the extensive education obtained about the fuels industry and its practices. This knowledge can then be applied to both the Air Force fuels community and the joint fuels community when the officer is assigned to an operational fuels position.

Based on their responses, respondents agreed that an advanced degree is required for an officer to fill an advanced fuels position. Most respondents recommend that the degree focus on petroleum management such as the Air Force Institute of Technology sponsored program at the University of Kansas. However, others stressed that a petroleum management degree is desirable, but that any degree which stresses the logistics and the supply chain is sufficient.

Exercises. Based on their responses, respondents agree that participation in exercises is extremely important. More specifically, they emphasized the need for joint exercise training to learn how different petroleum activities interact as well as the interdependency of DESC. Joint exercises would also provide officers with exposure to the various fuel equipment and systems utilized by the other military branches. Respondents stressed that officers must be provided the opportunity to apply their knowledge and abilities in controlled settings before actually being called upon to do so in real world situations or contingencies.

Additional Education and Training Responses. Previously in this section, the most common responses were presented in regard to the education and training required for LROs to fill advanced fuels positions. There were other responses provided far less frequently than those listed above. Due to the opinion-based nature of the interview question, it is not this researchers place to judge or ignore these responses due to the lack of their duplication. Additional education and training requirements as given by the respondents are listed in Table 4. The frequencies of the additional responses to the education and training category are listed in Appendix B.

Table 4: Additional Responses for Education and Training Requirements

Additional Education and Training Requirements
Air Force Institute of Technology Logistics courses
Financial Management training
Transportation Command Operations training
Acquisition Professional Development Program
Air Force Petroleum Office orientation
Petroleum Logistics Management Course
Joint Forces Staff College

Section Summary. This analysis provided two key findings. First, it provides insight into the specific types of education and training LROs need within the larger education and training category in order to fill advanced fuels related positions. For example, the sub-category of formal courses provides a better understanding of what LROs need to know than the larger education and training category alone.

Second, the analysis identifies a common theme throughout the education and training requirements necessary to fill advanced fuels positions. This theme is that the fuels discipline must be viewed as joint in nature. The joint theme comes as no surprise. Fuel is universal and the contingency operations of today are predominantly joint efforts. Therefore, joint education and training is required to prepare LROs to fill advanced fuels positions. This theme is confirmed in 80 percent of the interview responses for the education and training area. For example, the top four formal courses identified are joint in nature, and joint exercises are emphasized as well.

Experience Requirements

For the purpose of this question, experience was defined as the observing, encountering, or undergoing of things generally as they occur in the course of time. Based on analysis of the responses, the category of experience is broken down into the sub-categories of base level time requirements, contingency operations, command/base/mission diversity, and assignment order. The sub-categories are listed in Table 5. The frequencies of responses within the sub-categories are listed in Appendix C.

Table 5: Experience Requirements Category

Experience Requirements
Base Level Fuels Time Requirements
Contingency Operations
Command/Base/Mission Diversity
Assignment Order

<u>Base Level Fuels Time Requirements</u>. Based on the responses, all nineteen respondents agreed that base level fuels management flight experience is crucial in preparing the LRO for advanced fuels positions. They stressed that a LRO requires more than twelve months experience at the base level, exceeding the current requirement per the CFETP as discussed in Chapter 2. Table 6 breaks down the base level time requirement responses and the frequency in which they occurred in the interview results.

Table 6: Base Level Time Requirements Sub-Category

Time Requirements	Responses
36 months	7
24-36 months	3
24 months	6
18-24 months	3

Deployments. Based on the responses, thirteen of the nineteen respondents specifically address deployments in support of contingency operations as a requirement for LROs to fill advanced fuels positions. They expressed that the deployments were key because they lead to an understanding of the interactions between different services and countries. Also, deployments provide officers with practical experience with fuels operational readiness capability equipment (FORCE). However, two respondents stated that deployment was not necessary. One of these two stated that a deployment was unnecessary if the LRO had a good working knowledge of FORCE.

Command/Base/Mission Diversity. Based on the responses, eight of the nineteen respondents stressed diversity for base level assignments in command, base, or mission as a requirement to fill advanced fuels positions. They explain that this exposes the LRO to a variety of different airframes, equipment, and fuel systems. This exposure, in turn, enables the LRO to function more effectively in contingency environments.

Assignments. The definition of advanced fuels positions for this research was defined as fuels positions above the base level FMO. Ten of the respondents felt that one base level assignment was sufficient to move on to an advanced position; nine respondents felt that two base level assignments are required.

Thirteen of the respondents also suggested a particular order for the assignments. The most frequently referenced order was base level assignment(s) followed by an assignment to DESC. The next most referenced order was base level assignment(s) followed by an assignment to a MAJCOM. Interestingly, only six respondents listed only base level FMO assignments as necessary for movement to a more advanced fuels position, suggesting that the level of the advanced position is irrelevant. This researcher believes this happened because of the difference in the definition of advanced fuels position provided for this study and the traditional definition of advanced fuels positions, such as JPO and certain DESC positions. The assignment orders and frequency of responses are listed in Table 7.

Table 7: Assignment Order Sub-Category

Assignment Order	Responses
Base - DESC	8
Base - MAJCOM	4
Base – DESC or MAJCOM	1
Base Only	6

Additional Experience Responses. Previously in this section, the most common responses for the experience category have been presented in regard to the experience required for LROs to fill advanced fuels positions. There were other responses provided less frequently than those listed above. Additional experience requirements as given by the respondents are listed in Table 8. The frequencies of the additional responses to the experience category are listed in Appendix C.

Table 8: Additional Responses for Experience Requirements

Additional Experience Requirements
Inventory Control
Military Construction / Repair, Maintenance and Environmental Program
Tactical Air experience
Joint Planning experience
Logistics Distribution experience
Overseas Assignment at base level
Company Grade experience at MAJCOM/Joint/Air Staff level
EWI or AAD follow-up assignment to Air Staff, DESC, joint staff, MAJCOM
Non-fuels related Logistics Readiness Assignments

Section Summary. This analysis provided the identification of specific experience requirements necessary to fill advanced fuels positions. For example, the base level time requirements sub-category provides a better understanding of the experience LROs need rather than the larger experience category alone. The theme that fuels should be viewed as joint in nature continued through the discussion on deployments and the suggested assignments to DESC, where LROs work with both civilian agencies and other military branches.

Meeting the Requirements

Once the requirements for advanced fuels positions were identified, how to meet these requirements became the next logical question. Based on analysis of the responses, three main courses of action were identified to meet the requirements for advanced fuels positions. These courses of action are 1) increase formal training opportunities, 2) formal tracking of fuel expertise, and 3) sub-specialization within the LRO construct. They are listed in Table 9 in the order that they were most frequently referenced. The frequencies of all responses as they pertain to how to meet the requirements of advanced fuels positions are listed in Appendix D.

Table 9: Courses of Action to Meet Requirements

Courses of Action to Meet Requirements
Increase Formal Education/Training Opportunities
Formal Tracking of Fuels Expertise
Sub-specialization within LRO Construct

Education/Training Opportunities. Based on the responses, fifteen of the respondents agree that increasing education and training opportunities is required to prepare the LRO to fill advanced fuels positions. The courses and programs identified by the respondents were identified earlier in this chapter under the education and training requirements section. These courses and programs should be available to LROs identified for development for advanced fuels positions, not after the fact that they have been slotted to fill an advanced position. For example, these courses and training would fit into a formal training program framework designed for fuels officer development.

Formal Tracking of Fuels Expertise. Based on the responses, twelve of the respondents agree that formal tracking of fuels expertise is a must to ensure that the requirements of advanced fuels positions are met. Respondents stressed that tracking fuels expertise can be accomplished through diligent SEI management or through a formalized education path for fuels, or a combination of the two.

Respondents believe that the fuels management SEI should be meaningful. They stressed that the SEI should be based on the core requirements identified earlier for advanced fuels positions rather than on meeting base level criteria. This would allow advanced positions to be filled with the most qualified candidates. One respondent emphasized that SEI visibility should be at the Joint Staff/Air Staff levels to ensure that the Air Force is grooming the necessary number of LROs for advanced fuels positions.

Sub-Specialization. Based on the responses, seven of the respondents view sub-specialization within the LRO construct as required to gain the necessary education and experience requirements for advanced fuels positions. Basically, the respondents suggest that a group of officers should be identified to concentrate in the fuels area. One respondent believes the officers in this group should be identified at the junior captain and mid-major levels. This allows the officers some exposure and experience to the other disciplines within the LRO construct before specializing in the fuels area.

Five of the respondents specifically supported sub-specialization through a formalized education path for fuels officers. They believe this would create and identify a pool of candidates for advanced positions. One respondent suggested using a combination of a formal education path and the SEI. The respondent proposed using a fuels discipline professional development track (FDPD) for a certain number of LROs. The number of LROs would be determined by the number of advanced positions and other factors such as dismissal, retirements, attrition, etc. The SEI would be awarded following completion of the FDPD, thereby ensuring that a definite pool of LROs are groomed and ready for advanced fuels positions.

Interestingly, none of the respondents suggested re-establishing the fuels officer career field within the Air Force. This is surprising considering the autonomous nature and reputation of the Air Force fuels community. However, two respondents thought a new joint fuels officer career field would be beneficial.

Additional Responses. Previously in this section, the most common responses for the meeting requirements category have been presented in regard to preparing LROs to fill advanced fuels positions. There were other responses provided less frequently than those listed above. Additional responses on how to meet advanced fuels requirements are listed in Table 10. The frequencies of the additional responses to the meeting requirements category are listed in Appendix D.

Table 10: Additional Responses for Meeting Requirements

Additional Meeting Requirements Responses
More junior officer positions at the MAJCOM level
DESC funding for formal courses/training for all fuels officers
Set ceiling on advanced fuels positions converted to civilian positions
Ensure each deployment includes a LRO
Create joint career field to grow joint fuels officers
Establish joint fuels positions with sister services/allies
Commander involvement in the hiring process
Expand opportunities within DESC for young LROs
Re-establish the Office of the Secretary of Defense sponsored fuels position

Section Summary. This analysis provided the identification of possible courses of action that are needed to gain the requirements for an LRO to fill advanced fuels positions. The three most referenced courses of action are closely related. For example, the increased education and training opportunities could be part of a sub-specialization training plan. Furthermore, both the increased education and training opportunities and sub-specialization actions could provide the foundation for formal tracking of fuels expertise and experience.

Adequacy of Current Training Plan

Respondents identified the education/training and experience requirements required for an LRO to fill an advanced fuels position. Then they provided ways of meeting these requirements. The next question addressed how well the current LRO training plan prepares LROs in meeting the requirements of advanced fuels positions identified in the previous investigative questions. Of the nineteen respondents, eight of them determined that the current training plan does not prepare LROs at all in meeting the requirements of advanced fuels positions. Ten of them decided that the current training plan somewhat prepares LROs in meeting the requirements of advanced fuels positions. Nine of these ten respondents indicated that their answers are due primarily to the LROs exposure to fuels during the LRO basic course or through rotations through the flights at their first assignment. One respondent did not answer this question, stating that he was not familiar enough with the training plan to adequately answer the question. The analysis reveals that none of the respondents feel that the current LRO training plan adequately prepares LROs to fill advanced fuels positions. The responses and frequencies of each response are listed in Table 11.

Table 11: Current Training Plan Effectiveness Responses

Response	Frequency
Not at all	8
Somewhat prepares	10
Fully prepares	0
Over prepares	0

Additional Comments

At the end of the interview questionnaire, respondents were provided space to include additional comments. Thirteen of the respondents chose to do so. The remarks provided were primarily about the current training of LROs for fuels positions and the future state of fuels officers. The comments about the current training of LROs for fuels positions for the most part re-visited many of the responses provided in the investigative questions responses presented earlier in this chapter. For example, the belief that 12 months of fuels experience at base level is not sufficient was re-emphasized, as was the need for more fuels assignments, formal education, and deployments.

Overall, the respondents believe that logistics officers in the future will not possess the experience or education required to fill advanced fuels positions. One respondent described the situation as follows, "…the train wreck of having no fully qualified senior fuels officer is on the horizon and is only a short six or nine years away." Another respondent stated, "The AF has made a conscious decision not to develop fuels officers with the required experience to hold senior level positions." Yet another respondent remarked about the LRO training plan as whole by saying, "If the plan is to make the Air Force loggie incompetent and turn these positions over to maintenance officers, it will work." Again, the inadequacies of the LRO training plan provided the basis for the respondents' bleak outlook for fuels officers.

Spreadsheet Modeling of Fuels Experience

The final investigative question explored whether or not there will be enough LROs with fuels management experience to fill advanced fuels positions in the future.

Spreadsheet modeling of fuels experience was performed to determine the Air Force's ability to continue to field logistics officers with fuels management experience for advanced fuels positions since the implementation of the LRO career field. The spreadsheet modeling is primarily accomplished from a manning perspective. First, a spreadsheet model was developed to represent the entire LRO career field by rank. This model provided predicted numbers of LROs by rank, which were compared against the actual number of LROs by rank to validate the accuracy of the historical data used to develop the spreadsheet.

A model based on a 1-year training time requirement for getting officers trained with FMO experience was developed next. The results provide the number of LROs gaining FMO experience at the base level. This model is designated as the 1-year FMO model. This was followed by modeling the manning of major and lieutenant colonel billet fuels positions using the 1-year FMO model results. The results predict the number of LROs that could fill these positions. Next, a 2-year time requirement for FMO training was developed. This model is designated as the 2-year FMO model. The results were used to model the manning of major and lieutenant colonel billet fuels positions. As with the 1-year FMO model, the results predict the number of LROs that could fill these positions.

LRO Inventory Model. The LRO inventory model was developed using the following information; projected accession rates, historical retention rates by year of service, and historical promotion rates. Assumptions had to be made when building this model. The first assumption was that the retention and promotion rates would remain constant. Next, the average promotion years were assumed to stay constant; 10 year mark for promotion to major, 16 year mark for promotion to lieutenant colonel, and 22 year mark for promotion to colonel. To validate the model, the number of accessions from 2004 was inserted into the model and the results were compared to the actual numbers of LROs by rank as of October 2004. The results of the model were validated by comparing them to the actual number of LROs by rank and actual total number of LROs. The actual numbers came from a comprehensive listing of every LRO in the Air Force, which was sorted by rank to get the actual numbers. The results of the model using the projected accession rate, the 2004 accession rate, and the actual numbers of LROs, along with the actual totals of LROs by rank as of October 2004, are presented in Table 12. The results of the model are close to both the 2004 and actual by rank and overall LRO totals. Therefore, the historical data used to develop this model is appropriate to build additional models for this research. The variation in the model results and actual numbers was expected due to the differing accession rate, and slight variations in promotion rates, promotion years, and retention rates fluctuating in reality. The full model and formulas are located in Appendix E.

Table 12: LRO Inventory by Rank Model Results vs. Actual LRO Inventory

Rank	LROs with Projected Accessions (138)	LROs with 2004 Accessions (152)	Actual Inventory (Oct 2004)
Lt	661	728	716
Capt	484	534	693
Maj	500	551	410
Lt Col	272	299	302
Col	54	59	45
Total	1971	2171	2166

<u>1-Year FMO Model-FMO Training.</u> A 1-year training requirement scenario for training CGOs as the base level FMO was modeled. This means that an officer fills a

FMO position for exactly one year, which is the minimum requirement to earn the fuels management SEI. The fuels management SEI is earned only at the base level and is necessary to assume more advanced fuels positions. The officer is replaced immediately upon completion of that year by another LRO as the FMO.

Several assumptions were made in developing this model. Only the FMO would be allowed to earn the fuels management SEI. Retention rates, promotion rates, and promotion years were assumed to be constant. In addition, it was assumed that an LRO would not receive any fuels management experience during the first year of service. This is due to the time requirements of rotational training, technical school training, PME, and other factors in getting acclimated to the Air Force. The percentage of LROs in positions outside of the career field was assumed to be constant at 18 percent. Finally, it was assumed that the 48 authorized FMO positions would not be vacant at the same time. Therefore, the positions were evenly distributed with six positions being filled per year group. This provided the calendar years of service (CYOS) for a CGO to attain FMO experience at CYOS 2 – 9.

Using this spreadsheet model over a 20 year period, the number of CGOs and FGOs having FMO experience was modeled. The results were that 175 CGOs and 301 FGOs would have FMO experience over this time period. The 175 CGOs gaining FMO experience indicate that the Air Force should be very capable of filling the 48 FMO positions. These totals are broken down by rank in Table 13. This model, results, and formulas are in Appendix F.

Table 13: 1-Year FMO Model Results for FMO Experience

Company Grade Officers	FMO Experience	Field Grade Officers	FMO Experience
Lieutenant	34	Major	213
Captain	141	Lieutenant Colonel	88

<u>1-Year FMO Model-Major Billet Experience.</u> The manning of fuels positions requiring the rank of major was modeled. The number of officers promoted to major with FMO experience per the 1-year FMO experience model was used as the origin. This total was 180 per the 1-year FMO model results for FMO experience. The 213 majors represented in Table 13 includes officers promoted to major (180) and the number of majors not promoted for lieutenant colonel (33). Since an officer could be selected to fill an advanced position upon promotion to major, the origin of 180 was used. The model was developed using 18 authorized major fuels billets.

Several assumptions were made when developing this model. Fuels positions were assumed to follow a hierarchical path by rank. That is, to fill a major billet, an officer must have first filled the captain billet of FMO. To fill a lieutenant colonel billet, the officer must have filled a major billet. It was assumed that the major would be in the position for three years. In this model, the officer was not considered experienced until completion of the three year commitment. The percentage of LROs filling positions outside of the career field was assumed to be constant per rank at 18 percent. Promotion rates, promotion years, and retention rates were assumed to be constant. Also, it was assumed that all of the positions would not be vacant at the same time; therefore the authorized major billets were distributed evenly over the number of years an officer spends in the rank of major. Three positions were distributed per year group for a total of 18 over the six years an officer spends in the rank of major.

The 1-year FMO model for major fuels billet experience is displayed in Figure 7. The figures in columns A, B, and C represent majors available (MA). There are formulas under applicable column headings explaining how the calculations were made. The column headings are explained as follows:

Year Group – Represents the number of years spent in the rank of major.

CYOS – Represents the years of service that officers spend in the rank of major.

Retention Rate – Represents the percentage of officers that stay in the Air Force per year of service.

MA minus Billets per year – Majors available after factoring in the number serving in the career field and subtracting the three major positions filled per year.

MA with Retention Factor – Majors available after multiplying MA minus Billets per year by retention rate for the applicable CYOS.

MA with Broadening Factor – Majors available after multiplying MA with Retention Factor by the average percent of majors serving in career field.

Adjusted Majors Available – The final pool of majors available after billets, retention, and broadening considerations have been made.

Majors in Position – Represents the number of majors filling major billets at the start of a CYOS.

Major Billet Experience – Represents the number of majors with 3-year tour of major fuels billet experience; Majors in Position multiplied by retention rate.

The results of this model provided the number of officers having completed major fuels billet experience and the number of individuals gaining major fuels billet experience at any given time. The first three numbers in the Major Billet Experience column which covers the 10-12 years of service represents the number of majors serving in a fuels billet.

These majors have not yet completed the 3-year tour of duty. By adding these three numbers, the number of majors serving in major billet positions at any given time is 16. The last three numbers in that same column represent the majors that have completed the 3-year fuels billet tour, which covers the years of service of 13-15. By adding these three

		A	B	C	D	E	F	G
Year Group	CYOS	Retention Rate	MA minus Billets per year $(D_{t-1} - K)$	MA with Retention Factor (A X B)	MA with Broadening Factor (C X J)	Adjusted Majors Available (= D)	Majors in Position $(G_{t-1}+k)$	Major Billet Experience (F X A)
					147.60			
1	10	0.959	144.60	138.60	113.65	114	3	2.88
2	11	0.926	110.65	102.46	84.02	84	5.88	5.44
3	12	0.962	81.02	77.96	63.93	64	8.44	8.12
4	13	0.981	60.93	59.80	49.04	49	11.12	10.92
5	14	0.974	46.04	44.86	36.79	37	13.92	13.56
6	15	0.980	33.79	33.11	27.15	27	16.56	16.23

(note: initial value in column D = H X J)

H	Majors possessing FMO Experience	180
J	Average percent of personnel serving in career field	0.82
K	Number of major billets filled per year	3

Total number of majors currently in fuels billet	**16.44**	$(G_1+G_2+G_3)$
Majors with completed 3-year experience	**40.71**	$(G_4+G_5+G_6)$

Figure 7: 1-Year FMO Model for Major Fuels Billet Experience

numbers, the number of majors having completed major billet position duty at any given time is 40. These results indicate that by having 180 majors trained as FMOs, the Air Force would be able to adequately fill the 18 major billet fuels positions. This cycle continues as majors move on to lieutenant colonel and a new year group of majors begins filling the vacated major fuels positions. This model, results, and formulas are in Appendix G.

<u>1-Year FMO Model-Lieutenant Colonel Billet Experience.</u> The manning of fuels positions requiring the rank of lieutenant colonel was modeled. The number of officers promoted from major with both FMO and major fuels billet experience was used as the origin. In this case the number was 40 per the major fuels billet experience model previously discussed. The model was developed using 11 authorized major fuels billets.

Several assumptions were made when developing this model. Again, fuels positions were assumed to follow a hierarchical path by rank. Therefore, to fill a lieutenant colonel billet, the officer must have filled a major billet. It was assumed that the lieutenant colonel would be in the position for three years. In this model, the officer was not considered experienced until completion of the three year commitment. The percentage of LROs filling positions outside of the career field was assumed to be constant at 18 percent per rank. Promotion rates, promotion years, and retention rates were assumed to be constant. Also, it was assumed that all of the positions would not be vacant as the same time. For simplicity, the authorized lieutenant colonel billets were distributed at two per year group for the first five CYOS for lieutenant colonels.

The 1-year FMO model for lieutenant colonel fuels billet experience is displayed in Figure 8. The LTCA in columns A, B, and C represents lieutenant colonels available. There are formulas under applicable column headings explaining how the calculations were made. The column headings are explained as follows:

Year Group – Represents the number of years spent in the rank of Lt Col.

CYOS – Represents the years of service that officers spend in the rank of Lt Col.

Retention Rate – Represents the percentage of officers that stay in the Air Force per year of service.

LTCA minus Billets per year – Lt Cols available after factoring in the number serving in the career field and subtracting three Lt Col positions filled per year.

LTCA with Retention Factor – Lt Cols available after multiplying MA minus Billets per year by retention rate for the applicable CYOS.

LTCA with Broadening Factor – Lt Cols available after multiplying MA with Retention Factor by the average percent of Lt Cols serving in career field.

Adjusted Lt Cols Available – The final pool of Lt Cols after billets, retention, and broadening considerations have been made.

Lt Cols in Position – Represents the number of Lt Cols filling Lt Col billets at the start of a CYOS.

Lt Col Billet Experience – Represents the number of Lt Cols with 3-year tour of major fuels billet experience; Lt Cols in Position multiplied by retention rate.

		A	B	C	D	E	F	G
Year Group	CYOS	Retention Rate	LTCA minus Billets per year (D_{t-1} - K)	LTCA with Retention Factor (A X B)	LTCA with Broadening Factor (C X J)	Adjusted Lt Cols Available (= D)	Lt Cols in Position (G_{t-1}+k)	Lt Col Billet Experience (F X A)
					32.80			
1	16	0.972	30.80	29.94	24.55	25	2	1.94
2	17	0.934	22.55	21.06	17.27	17	3.94	3.68
3	18	0.984	15.27	15.03	12.32	12	5.68	5.59
4	19	0.973	10.32	10.04	8.23	8	7.59	7.39
5	20	0.806	6.23	5.03	4.12	4	9.39	7.57
6	21	0.782	2.12	1.66	1.36	1	7.57	5.92

(note: initial value in column D = H X J)

H	Lt Cols possessing FMO Experience	40	
J	Average percent of personnel serving in career field	0.82	
K	Number of Lt Col billets filled per year	2	
	Total number of Lt Cols currently in fuels billet	11.22	(G_1+G_2+G_3)
	Lt Cols with completed 3-year experience	20.87	(G_4+G_5+G_6)

Figure 8: 1-Year FMO Model for Lieutenant Colonel Fuels Billet Experience

The results of this model provided the number of officers having completed lieutenant colonel fuels billet experience and the number of individuals gaining this experience at any given time. The first three numbers in the Lt Col Billet Experience column which covers the 16-18 years of service represents the number of lieutenant colonels serving in a fuels billet. These officers have not yet completed the 3-year tour of duty. By totaling these three numbers, the number of lieutenant colonels serving in lieutenant billet positions at any given time is 11. The last three numbers in that same column represent the lieutenant colonels that have completed the 3-year fuels billet tour, which covers the years of service of 19-21. By totaling these three numbers, the number of officers having completed lieutenant colonel billet position duty at any given time is 20. These results indicate that by having 40 majors with both FMO and major fuels billet experience, the Air Force would be able to adequately fill the 11 lieutenant colonel billet fuels positions. This cycle continues as lieutenant colonels get promoted or retire and a new year group of lieutenant colonels begins filling the vacated lieutenant colonel fuels positions. This model, results, and formulas are in Appendix G.

2-Year FMO Model-FMO Training. A 2-year training requirement scenario for training CGOs as the base level FMO was modeled. This scenario calls for the LRO to remain in the FMO position for two years to earn the fuels management SEI. This model called for the same assumptions as the 1-year FMO model in relation to historical data. However, with the 24 month constraint, an FMO position would become vacant every two years. Therefore, the positions were evenly distributed at three per year group.

Using this spreadsheet model over a 20 year period, the number of CGOs and FGOs having FMO experience was modeled. The results were that 87 CGOs would get FMO experience and 150 FGOs would have FMO experience over this time period. With 87 CGOs gaining FMO experience, the Air Force should be capable of filling the 48

FMO positions. These totals are broken down by rank in Table 14. This model, the results, and formulas are in Appendix I.

Table 14: 2-Year FMO Model Results for FMO Experience

Company Grade Officers	FMO Experience	Field Grade Officers	FMO Experience
Lieutenant	17	Major	90
Captain	70	Lieutenant Colonel	44

To validate the 2-year model, the number of captains, majors, and lieutenant colonels were calculated and compared to the actual numbers of personnel from these ranks possessing the fuels management SEI. The actual data came from two sources. First, a listing of officers from 2001 still on active duty as of 2004 with the fuels management SEI under the supply officer construct, designated as LLI, was reviewed. Secondly, a listing of officers as of October 2004 having earned the fuels management SEI under the LRO construct, designated as LKY, was reviewed. The numbers from each list for the ranks of captain, majors, and lieutenant colonels were combined to get the actual number of officers with the fuels management SEI by rank. Then both the modeled and actual sets of numbers were compared to the senior fuels personnel listing from the 2003/2004 Blue Book which lists senior personnel with the fuels management SEI. The comparison for the modeled, actual, and Blue Book figures are presented in Table 15.

Table 15: Model Validation of Fuels Personnel with SEI by Rank

	Captain	Major	Lt Col	Total
Model	70	90	44	204
Actual	66	74	36	176
Blue Book	71	65	34	170

The model totals for fuel personnel with the fuels management SEI for the ranks of major (90) and lieutenant colonel (44) are optimistic as compared to the actual and Blue Book figures. This leads to the total of 204 fuels personnel with the SEI as being optimistic as well. These optimistic figures were expected due to the promotion year, promotion rate, and retention rate assumptions. Also, it would be extremely difficult to model all of the variables that could affect training. Additionally, administrative shortfalls may have an effect. For example, some officers may have met the requirements for award of the SEI, but the paperwork has not been processed or generated at all. Updating issues with software packages could be another complication.

2-Year FMO Model-Major Billet Experience. The manning of fuels positions requiring the rank of major was modeled. The number of officers promoted to major with FMO experience per the 2-year FMO model results for FMO experience was used as the origin. This total was 90. The model was developed using 18 authorized major fuels billets. The same assumptions that applied to the 1-year FMO model for major billet experience apply to this model.

The 2-year FMO model for majors fuels billet experience is displayed in Figure 9. The MA in columns A, B, and C represents majors available. There are formulas under applicable column headings explaining how the calculations were made. Column headings are explained as follows:

Year Group – Represents the number of years spent in the rank of major.

CYOS – Represents the years of service that officers spend in the rank of major.

Retention Rate – Represents the percentage of officers that stay in the Air Force per year of service.

MA minus Billets per year – Majors available after factoring in the number serving in the career field and subtracting the three major positions filled per year.

MA with Retention Factor – Majors available after multiplying MA minus Billets per year by retention rate for the applicable CYOS.

MA with Broadening Factor – Majors available after multiplying MA with Retention Factor by the average percent of majors serving in career field.

Adjusted Majors Available – The final pool of majors after billets, retention, and broadening considerations have been made.

Majors in Position – Represents the number of majors filling major billets at the start of a CYOS.

Major Billet Experience – Represents the number of majors with 3-year tour of major fuels billet experience; Majors in Position multiplied by retention rate.

		A	B	C	D	E	F	G
Year Group	CYOS	Retention Rate	MA minus Billets per year (D_{t-1} - K)	MA with Retention Factor (A X B)	MA with Broadening Factor (C X J)	Adjusted Majors Available (= D)	Majors in Position (G_{t-1}+k)	Major Billet Experience (F X A)
					73.80			
1	10	0.959	70.80	67.86	55.65	56	3	2.88
2	11	0.926	52.65	48.75	39.97	40	5.88	5.44
3	12	0.962	36.97	35.58	29.18	29	8.44	8.12
4	13	0.981	26.18	25.69	21.07	21	11.12	10.92
5	14	0.974	18.07	17.61	14.44	14	13.92	13.56
6	15	0.980	11.44	11.21	9.19	9	16.56	16.23

(note: initial value in column D = H X J)

H	Majors possessing FMO Experience	90	
J	Average percent of personnel serving in career field	0.82	
K	Number of major billets filled per year	3	
	Total number of majors currently in fuels billet	**16.44**	**(G_1+G_2+G_3)**
	Majors with completed 3-year experience	**40.71**	**(G_4+G_5+G_6)**

Figure 9: 2-Year Model for Major Fuels Billet Experience

The results of this model provided the number of officers having completed major fuels billet experience and the number of individuals gaining experience at any given time. The first three numbers in the Major Billet Experience column which covers the 10-12 years of service represents the number of majors serving in a fuels billet. These majors have not yet completed the 3-year tour of duty. By adding these three numbers, the number of majors in serving in major billet positions at any given time is 16. The last three numbers in that same column represent the majors that have completed the 3-year fuels billet tour, which covers the years of service of 13-15. By adding these three numbers, the number of majors having completed major billet position duty at any given time is 40. This is the same result as the 1-year FMO model, which is expected with the large number of majors available to fill the positions. This cycle continues as majors move on to lieutenant colonel and a new year group of majors begins filling the vacated major fuels positions. This model, results, and formulas are in Appendix J.

<u>2-Year FMO Model-Lieutenant Colonel Billet Experience.</u> The manning of fuels positions requiring the rank of lieutenant colonel was modeled. The number of officers promoted from major with both FMO and major fuels billet experience was used as the origin. In this case the number was 40 per the major fuels billet experience model just presented. The model was developed using 11 authorized major fuels billets. For simplicity, the authorized lieutenant colonel billets were distributed at two per year group for the first five CYOS for lieutenant colonels. The same assumptions that applied to the 1-year FMO model for lieutenant colonel billet experience apply to this model.

The model is displayed in Figure 10. The LTCA in columns A, B, and C represents lieutenant colonels available. There are formulas under applicable column headings explaining how the calculations were made. The column headings are explained as follows:

Year Group – Represents the number of years spent in the rank of Lt Col.

CYOS – Represents the years of service that officers spend in the rank of Lt Col.

Retention Rate – Represents the percentage of officers that stay in the Air Force per year of service.

LTCA minus Billets per year – Lt Cols available after considering the number serving in the career field and subtracting three Lt Col positions filled per year.

LTCA with Retention Factor – Lt Cols available after multiplying MA minus Billets per year by retention rate for the applicable CYOS.

LTCA with Broadening Factor – Lt Cols available after multiplying MA with Retention Factor by the average percent of Lt Cols serving in career field.

Adjusted Lt Cols Available – The final pool of Lt Cols after billets, retention, and broadening considerations have been made.

Lt Cols in Position – Represents the number of Lt Cols filling major billets at the start of a CYOS. This number is cumulative over the six years.

Lt Col Billet Experience – Represents the number of Lt Cols with 3-year tour of Lt Col fuels billet experience; Lt Cols in Position multiplied by retention rate.

The results of this model provided the number of officers having completed lieutenant colonel fuels billet experience and the number of individuals gaining this experience at any given time. Due to the number of lieutenant colonels available being the same as with the 1-year model, the results are the same. The number of lieutenant colonels serving in lieutenant billet positions at any given time is 11. The number of officers having completed lieutenant colonel billet position duty at any given time is 20. These results indicate that by having 40 majors with both FMO and major fuels billet experience, the Air Force would be able to adequately fill the 11 lieutenant colonel billet fuels positions. This cycle continues as lieutenant colonels get promoted or retire and a new year group of lieutenant colonels begins filling the vacated lieutenant colonel fuels positions. This model, results, and formulas are in Appendix K.

		A	B	C	D	E	F	G
Year Group	CYOS	Retention Rate	LTCA minus Billets per year (D_{t-1} - K)	LTCA with Retention Factor (A X B)	LTCA with Broadening Factor (C X J)	Adjusted Lt Cols Available (= D)	Lt Cols in Position (G_{t-1}+k)	Lt Col Billet Experience (F X A)
					32.80			
1	16	0.972	30.80	29.94	24.55	25	2	1.94
2	17	0.934	22.55	21.06	17.27	17	3.94	3.68
3	18	0.984	15.27	15.03	12.32	12	5.68	5.59
4	19	0.973	10.32	10.04	8.23	8	7.59	7.39
5	20	0.806	6.23	5.03	4.12	4	9.39	7.57
6	21	0.782	2.12	1.66	1.36	1	7.57	5.92

(note: initial value in column D = H X J)

H	Lt Cols possessing FMO Experience	40	
J	Average percent of personnel serving in career field	0.82	
K	Number of Lt Col billets filled per year	2	
	Total number of Lt Cols currently in fuels billet	11.22	(G_1+G_2+G_3)
	Lt Cols with completed 3-year experience	20.87	(G_4+G_5+G_6)

Figure 10: 2-Year FMO Model for Lt Col Fuels Billet Experience

Section Summary. The spreadsheet models just described were developed to predict the Air Force's ability to fill authorized fuels positions in the future. The LRO inventory model proved valid in comparison to the actual LRO inventory. Therefore, the data and assumptions used to construct the inventory model were used to develop the fuels experience models. The fuels experience models included both the base level FMO positions and the advanced fuels positions as defined for this study. These models were expected to be optimistic due to the fact that all of the variables affecting training and manning decisions could not be modeled. Additionally, the competing manning requirements for other LRO specialties were not represented in the models. Based on the results of these models, the Air Force should be able to fill fuels positions at the base and advanced levels from a manpower perspective.

Chapter Summary

This chapter provided a review of the research objective and the five investigative questions. It provided the results of the research conducted to answer each of these questions. Common themes and conclusions from the questionnaires were presented as well as specific requirements for advanced fuels positions based on expert opinions. Also, an evaluation of the current LRO training plan was discussed along with the general common view of its effectiveness. Finally, this chapter discussed the spreadsheet modeling efforts used to determine the Air Force's ability to continue to field logistics officers experienced in fuels management for advanced fuels positions from a manning perspective. The models and their respective results were presented and discussed as well. Chapter 5 presents conclusions and recommendations based on the analysis presented here.

V. Conclusions and Recommendations

Introduction

The objective of this research is to determine the impact of the changes due to the LRO career field implementation on the Air Force's ability to continue to field logistics officers with fuels management experience for advanced fuels positions. This chapter presents the major conclusions drawn from the results and analysis of this research effort. Recommendations will be given for changes to the current system of training and managing LROs to fill advanced fuels positions. Recommendations for further research will also be provided.

Conclusions

This thesis yielded many interesting results and provided a great deal of insight into the Air Force's ability to continue to field logistics officers with fuels management experience for advanced fuels positions. From a purely manning perspective, there appears to be very little, if any, impact on fielding experienced officers for advanced fuels positions. The Air Force should be able to produce more than enough officers with fuels management experience as represented by the 1-year FMO experience and the 2-year FMO experience models. This assumes one LRO serves as the FMO, gaining the fuels management SEI. The number of LROs being awarded the fuels management SEI in the future most likely will be much larger than those modeled due to the fact that many squadron commanders are assigning two or three LROs to their respective fuels management flights in order to help them get qualified per the CFETP. Though many

LROs will be awarded the fuels management SEI, questions arise as to whether or not they are truly qualified to fill advanced fuels positions.

Being prepared to fill advanced fuels positions requires much more than simply spending time in a fuels management flight. The issues of education/training and experience become very important. Consequently, the Air Force's ability to continue to field logistics officers with fuels management experience for advanced fuels positions is negatively impacted. The training plan established to train LROs as an FMO is inadequate in preparing LROs for advanced fuels positions. In fact, there is no training plan to prepare them for these positions. However, experts reveal that there is much more education/training and experience required.

The education and training requirements necessary to fill advanced fuels positions are not met under the LRO construct. These requirements are characterized by limited opportunity. These requirements come in the form of formal courses, professional programs, and exercises. Enhancing the LRO's ability to operate in the joint environment typical of today's contingencies should be a main focus of these three areas.

Under the LRO construct, experience requirements fall short in preparing the LRO to fill advanced fuels positions. The experience time requirement for earning the fuels management SEI should be more demanding than the 12 months as the base level FMO in order to fill advanced fuels positions. Twelve months is not enough time to grasp the managerial concepts and technical aspects of base level fuels much less those required of advanced fuels positions. Additionally, experience should include diversity gained through exposure to differing missions and fuels equipment, particularly FORCE.

To meet the requirements for advanced fuels positions as identified through the research, there must be a framework in place to ensure that there are enough LROs with the required expertise to fill advanced fuels positions. Tracking LROs expertise in fuels management is necessary for identifying truly qualified officers for advanced fuels positions. This may require sub-specialization into the fuels discipline, which is contrary to the LRO construct philosophy. However, there must be a method to identify a pool of candidates meeting the requirements for advanced fuels positions.

The lack of education and experience in operating in a joint environment is a critical shortcoming of the LRO construct in relation to preparing LROs for advanced fuels positions. A philosophical shift is needed from thinking about fuels activities as Air Force unique to a more joint oriented mind-set which considers the universal nature of the fuels discipline. This mind-set should begin at the basic LRO training level.

Recommendations

The current training plan does not adequately prepare LROs to fill advanced fuels positions. It does not mandate training for officers in fuels positions above the base level FMO. Therefore, this researcher recommends developing a training plan encompassing base level and advanced fuels position requirements. This training plan is to be used throughout the officers' career. Though this plan remains under the LRO construct, it becomes the primary training track for a select group of LROs. This allows for the officers in this track to fill other non-fuels related LRO positions, yet marks them to become fuels experts. This track ensures training throughout the officers' careers rather than only at the base level. As a result, this will maintain, or perhaps improve fuels expertise levels and provide stability in the fuels arena.

A formal framework to track and monitor fuels expertise needs to be established. This framework would complement the training path encompassing advanced fuels position requirements. A separate SEI, unique from the one earned as base level FMO, would be awarded based on successful completion of the fuels training track. Identifying a group of LROs with the requirements for advanced fuels positions would be possible. Just as importantly, it would make visible those needing training to meet the requirements and allow for detailed management and tracking of an officer's progress.

Recommendations for changes to the base level FMO requirements are also in order. The fuels management SEI should only be awarded to the FMO. Furthermore, the SEI would denote experience as the FMO for continuation in the fuels training track and not serve as the sole qualifier for advanced fuels positions. This would promote truly learning the fuels operation from both the managerial and technical viewpoints, as opposed to the familiarity training being received today. To facilitate this, the time requirement as the FMO should be increased to a minimum of 24 months. As shown by the 2-year FMO experience model, this would not hinder the Air Force's ability to provide LROs with fuels management experience.

Recommendations for Future Research

The questionnaire used in this research effort identified the education/training and experience requirements necessary for LROs to fill advanced fuels positions. These results could be used to develop a survey instrument to construct a task specific education and training framework from which to guide the development of officers for advanced fuels positions.

A similar questionnaire could be used to assess the LRO training program for fuels management from the FMO perspective. The population could consist of LROs receiving the fuels management SEI since the implementation of the 21RX career field. This could assist in identifying the training requirements specifically for officers filling FMO positions, as well as the readiness of these officers for more advanced positions. Additionally, the questionnaire could be modified to gain the perspectives of senior enlisted personnel on the effects of the LRO implementation on officer development for fuels positions.

Because of the relatively short amount of time since the consolidation of the supply, transportation, and logistics plans career fields, the effects have yet to be fully realized. Therefore, another study should be conducted in five years. This would construct a more distinct picture on the effects of the LRO career field implementation on not only the Air Force's ability to field senior logistics officer experienced in fuels management, but on the fuels discipline as a whole.

Training, developing, and managing personnel with expertise in critical functional areas such as fuels management presents a multitude of research opportunities. This research laid the foundation for future research efforts on the training and management of LROs within the fuels discipline. Furthermore, similar research efforts could be utilized in other career fields in the Air Force that have consolidated critical functional areas into one field.

Appendix A: Advanced Fuels Position Requirements Questionnaire

Introduction:

The purpose of this interview is to collect data for use in a HQ IL sponsored thesis project. The intent of this thesis is two-fold. The initial effort is focused on determining the requirements of advanced positions within the fuels discipline. Your responses will provide the necessary data for this effort. The second part of the thesis focuses on the impact of the changes due to the LRO career field implementation on the Air Force's ability to continue to field experienced fuels officers for advanced fuels positions.

All answers are anonymous. No identification of individual responses will occur. The demographic information requested will serve only as a means for interpreting the results more accurately.

Demographic Information:

Name:

Rank:

Fuels Experience (yrs):

Current Position:

Previous Fuels Positions:

The following questions will provide the bulk of the data for this research effort. The questions are intentionally vague and open-ended. Please answer the questions as thoroughly as possible based on your interpretation of the question.

Definitions:

Advanced Fuels Position: Fuels positions above the base level FMO.

Education: Knowledge and skills gained through formal instruction or study.

Training: Practice used to develop proficiency in some profession.

Experience: The observing, encountering, or undergoing of things generally as they occur in the course of time.

Interview Questions:

Question 1:

Please answer the question as thoroughly and specifically as possible. Consider all of the fuels positions you have held above base level FMO.

In your opinion, what education and training is required for a LRO to fill advanced positions within the fuels discipline?

(i.e. formal courses, leadership training, joint courses/training, exercises, advanced degrees, specific tasks, etc)

Question 2:

Please answer the question as thoroughly and specifically as possible. Consider all of the fuels positions you have held above base level FMO.

In your opinion, what practical experience is required for a LRO to fill advanced positions within the fuels discipline?

(i.e. command diversity, assignments, airframe diversity, refueling systems diversity, fuels equipment, fuels positions, years of experience required, years between fuels assignments, deployments, etc)

Question 3:

Please answer the question as thoroughly and specifically as possible.

What steps can be taken so the requirements of advanced positions within the fuels discipline you identified in questions 1 and 2 can be met?

Question 4:

Please **bold** your response.

How well does the current training plan prepare LROs to meet the requirements necessary to fill advanced positions within the fuels discipline?

e. Not at all
f. Somewhat Prepares
g. Fully Prepares
h. Over Prepares

Additional Comments:

Appendix B: Responses/Frequency For Education and Training Category

Formal Courses	Respondents
Defense Energy Support Center (DESC) courses	13
Petroleum and Water Course	10
Contingency Wartime Planning Course	9
Logistics Readiness Officer Basic Course	8
Fuels Operational Readiness Capability Equipment (FORCE) courses	6
Leadership courses	5
Professional Programs	
Education with Industry	8
Advanced Academic Degree programs	8
Exercises	
Joint Exercises	5
Additional Education and Training Requirements	
Air Force Institute of Technology Logistics courses	2
Financial Management training	1
Transportation Command Operations training	1
Acquisition Professional Development Program	1
Air Force Petroleum Office orientation	1
Petroleum Logistics Management Course	1
Joint Forces Staff College	1
Professional Enhancement Program	1

Appendix C: Responses/Frequency For Experience Category

Base Level Time Requirements	Respondents
36 months	7
24-36 months	3
24 months	6
18-24 months	3
Deployments	
Deployment in Support of Contingency Operations	13
Diversity	
Command/Mission Diversity	8
Assignment Order	
Base - DESC	8
Base - MAJCOM	4
Base - DESC or MAJCOM	1
Base Only	6
Additional Experience Requirements	
Air Staff Assignment	3
Inventory Control	1
Military Construction / Repair, Maintenance and Environmental Program	1
Tactical Air experience	1
Joint Planning experience	1
Logistics Distribution experience	1
Overseas Assignment at base level	1
Company Grade experience at MAJCOM/Joint/Air Staff level	1
EWI/AAD follow-up tour to Air Staff, DESC, joint staff, MAJCOM	1
Non-Fuels related Logistics Readiness Assignments	1

Appendix D: Response/Frequency For Meeting Requirements

Course of Action	Respondents
Increase Formal Education/Training Opportunities	15
Formal Tracking of Fuels Expertise	12
Sub-specialization within LRO Construct	7
Additional Education and Training Requirements	
More junior officer positions at the MAJCOM level	2
DESC funding for formal courses/training for all fuels officers	2
Set ceiling on advanced fuels positions converted to civilian positions	1
Ensure each deployment includes a LRO	1
Create joint career field to grow joint fuels officers	1
Establish joint fuels positions with sister services/allies	1
Commander involvement in the hiring process	1
Expand opportunities within DESC for young LROs	1
Re-establish the Office of the Secretary of Defense sponsored fuels position	1

Appendix E: LRO Inventory by Rank Model Results/Formulas

	A	B	C	D	E	F	G	H	I
1									
2									
3	**CYOS**	**Retention**	**2LT**	**1LT**	**CAPT**	**MAJ**	**LTC**	**COL**	
4	0	1.000	138						
5	1	0.978	134.906						
6	2	0.991	133.679						
7	3	0.989		132.230					
8	4	0.916		121.153					
9	5	0.899		0.763	108.196				
10	6	0.924		0.005	100.683				
11	7	0.950			95.633				
12	8	0.935			89.410				
13	9	0.960			85.850				
14	10	0.959			3.950	78.339			
15	11	0.926			1.013	72.536			
16	12	0.962				69.805			
17	13	0.981				68.512			
18	14	0.974				66.763			
19	15	0.980				65.421			
20	16	0.972				17.609	45.961		
21	17	0.934				16.453	42.943		
22	18	0.984				16.187	42.250		
23	19	0.973				15.753	41.116		
24	20	0.806				12.693	33.130		
25	21	0.782					25.916		
26	22	0.882					11.136	11.731	
27	23	0.848					9.439	9.943	
28	24	0.841					7.935	8.359	
29	25	0.830					6.588	6.939	
30	26	0.814					5.362	5.648	
31	27	0.894						5.047	
32	28	0.738						3.725	
33	29	0.643						2.395	
34	30	0						0	
35									
36				**LT**	**Capt**	**Maj**	**Lt Col**	**Col**	**Total**
37		**Totals:**	Model:	661	485	500	272	54	**1971**
38									
39									
40									
41		Promotion	rates		Not Promoted rate				
42		1Lt	1.000		1Lt	0			
43		Capt	0.993		Capt	0.007			
44		Maj	0.952		Maj	0.048			
45		Lt Col	0.723		Lt Col	0.277			
46		Col	0.513		Col	0.487			

Cell	Formula	Value		Cell	Formula	Value
C5	=C4*B5	134.906		A11	=A10+1	7
C6	=C5*B6	133.679		A12	=A11+1	8
D7	=(C6*B7*C42)	132.230		A13	=A12+1	9
D8	=D7*B8	121.153		A14	=A13+1	10
D9	=D8*B9*F43	0.763		A15	=A14+1	11
D10	=D9*B10*F43	0.005		A16	=A15+1	12
E9	=(D8*B9)*C43	108.196		A17	=A16+1	13
E10	=(D9*B10*C43)+(E9*B10)	100.683		A18	=A17+1	14
E11	=E10*B11	95.633		A19	=A18+1	15
E12	=E11*B12	89.410		A20	=A19+1	16
E13	=E12*B13	85.850		A21	=A20+1	17
E14	=(E13*B14)*(1-C44)	3.950		A22	=A21+1	18
E15	=(E14*B15)*(1-C45)	1.013		A23	=A22+1	19
F14	=(E13*B14)*C44	78.339		A24	=A23+1	20
F15	=F14*B15	72.536		A25	=A24+1	21
F16	=F15*B16	69.805		A26	=A25+1	22
F17	=F16*B17	68.512		A27	=A26+1	23
F18	=F17*B18	66.763		A28	=A27+1	24
F19	=F18*B19	65.421		A29	=A28+1	25
F20	=(F19*(B20)*(F45))	17.609		A30	=A29+1	26
F21	=F20*B21	16.453		A31	=A30+1	27
F22	=F21*B22	16.187		A32	=A31+1	28
F23	=F22*B23	15.753		A33	=A32+1	29
F24	=F23*B24	12.693		A34	=A33+1	30
G20	=(F19*B20)*C45	45.961		H26	=G25*B26*C46	12
G21	=(G20*B21)	42.943		H27	=H26*B27	10
G22	=G21*B22	42.250		H28	=H27*B28	8
G23	=G22*B23	41.116		H29	=H28*B29	7
G24	=G23*B24	33.130		H30	=H29*B30	6
G25	=G24*B25	25.916		H31	=H30*B31	5
G26	=G25*B26*F46	11.136		H32	=H31*B32	4
G27	=G26*B27	9.439		H33	=H32*B33	2
G28	=G27*B28	7.935		H34	=H33*B34	0
G29	=G28*B29	6.588		D37	=SUM(C4:C6)+SUM(D7:D10)	661
G30	=G29*B30	5.362		E37	=SUM(E9:E15)	485
A5	=A4+1	1		F37	=SUM(F14:F24)	500
A6	=A5+1	2		G37	=SUM(G20:G30)	272
A7	=A6+1	3		H37	=SUM(H26:H33)	54
A8	=A7+1	4		I37	=SUM(D37:H37)	1971
A9	=A8+1	5		F43	=1-C43	0.007
A10	=A9+1	6		F44	=1-C44	0.048
				F45	=1-C45	0.277
				F46	=1-C46	0.487

Appendix F: 1-Year FMO Model – FMO Training

	A	B	C	D	E	F	G	H	I	J	K
1						FMO exp	FMO Exp	FMO exp	FMO Exp	FMO exp	FMO Exp
2		Retention		No Fuels	FMO	Not promoted	Promoted	Not promoted	Promoted	Not promoted	Promoted
3	Year	Rate	CYOS	Experience	Experience	Capt	Capt	Maj	Maj	LTC	LTC
4	2002	1.000	0	138	0.00						
5	2003	0.978	1	135	0.00						
6	2004	0.991	2	128	5.95						
7	2005	0.989	3	120	11.82						
8	2006	0.916	4	105	16.32						
9	2007	0.899	5	89		0.11	19.94				
10	2008	0.924	6	77			23.97				
11	2009	0.950	7	67			28.46				
12	2010	0.935	8	57			32.22				
13	2011	0.960	9	49			36.70				
14	2012	0.959	10					1.69	33.49		
15	2013	0.926	11						31.01		
16	2014	0.962	12						29.84		
17	2015	0.981	13						29.29		
18	2016	0.974	14						28.54		
19	2017	0.980	15						27.97		
20	2018	0.972	16							7.53	19.65
21	2019	0.934	17							7.03	18.36
22	2020	0.984	18							6.92	18.06
23	2021	0.973	19							6.73	17.58
24	2022	0.806	20							5.43	14.16
25											
26				Projected Accesssions per year		138					
27											
28				Number of FMOs trained per year		6					
29											
30		Total number of CGOs with FMO experience				175.37					
31											
32		Total number of FGOs with FMO experience				301.58					
33											
34			Rates								
35	Promoted			Not	Promoted						
36											
37	1Lt	1.000		1Lt	0						
38	Capt	0.993		Capt	0.007						
39	Maj	0.952		Maj	0.048						
40	Lt Col	0.723		Lt Col	0.277						
41	Col	0.513		Col	0.487						

Cell	Formula	Value	Cell	Formula	Value
E6	=(E5+F28)*B6	5.945	A9	=A8+1	2007
E7	=(E6+$F$28)*B7	11.816	A10	=A9+1	2008
E8	=(E7+$F$28)*B8	16.323	A11	=A10+1	2009
F9	=E8*E37	0.114	A12	=A11+1	2010
D5	=D4*B5	134.906	A13	=A12+1	2011
D6	=(D5-$F$28)*B6	127.734	A14	=A13+1	2012
D7	=(D6-$F$28)*B7	120.414	A15	=A14+1	2013
D8	=(D7-$F$28)*B8	104.829	A16	=A15+1	2014
D9	=(D8-$F$28)*B9	88.882	A17	=A16+1	2015
D10	=(D9-$F$28)*B10	76.591	A18	=A17+1	2016
D11	=(D10-$F$28)*B11	67.050	A19	=A18+1	2017
D12	=(D11-$F$28)*B12	57.078	A20	=A19+1	2018
D13	=(D12-$F$28)*B13	49.044	A21	=A20+1	2019
G9	=(E8+F28)*B9*B37	19.936	A22	=A21+1	2020
G10	=(G9+$F$28)*B10	23.967	A23	=A22+1	2021
G11	=(G10+$F$28)*B11	28.464	A24	=A23+1	2022
G12	=(G11+$F$28)*B12	32.222	C5	=C4+1	1
G13	=(G12+$F$28)*B13	36.700	C6	=C5+1	2
H14	=G13*E38*B14	1.689	C7	=C6+1	3
I14	=G13*B14*B38	33.489	C8	=C7+1	4
I15	=I14*B15	31.008	C9	=C8+1	5
I16	=I15*B16	29.841	C10	=C9+1	6
I17	=I16*B17	29.288	C11	=C10+1	7
I18	=I17*B18	28.540	C12	=C11+1	8
I19	=I18*B19	27.967	C13	=C12+1	9
J20	=I19*B20*E39	7.528	C14	=C13+1	10
K20	=I19*B39*B20	19.648	C15	=C14+1	11
J21	=J20*B21	7.033	C16	=C15+1	12
K21	=K20*B21	18.358	C17	=C16+1	13
J22	=J21*B22	6.920	C18	=C17+1	14
K22	=K21*B22	18.062	C19	=C18+1	15
J23	=J22*B23	6.734	C20	=C19+1	16
K23	=K22*B23	17.577	C21	=C20+1	17
J24	=J23*B24	5.426	C22	=C21+1	18
K24	=K23*B24	14.162	C23	=C22+1	19
A5	=A4+1	2003	C24	=C23+1	20
A6	=A5+1	2004	F30	=SUM(E6:E8)+SUM(G9:G13)	175.374
A7	=A6+1	2005	F32	=SUM(I14:I19,J20:J24,K20:K24)	301.579
A8	=A7+1	2006			

Appendix G: 1-Year FMO Model – Major Fuels Billet Experience

		A	B	C	D	E	F	G
Year Group	CYOS	Retention Rate	MA minus Billets per year (D_{t-1} - K)	MA with Retention Factor (A X B)	MA with Broadening Factor (C X J)	Adjusted Majors Available (= D)	Majors in Position (G_{t-1}+k)	Major Billet Experience (F X A)
					147.60			
1	10	0.959	144.60	138.60	113.65	114	3	2.88
2	11	0.926	110.65	102.46	84.02	84	5.88	5.44
3	12	0.962	81.02	77.96	63.93	64	8.44	8.12
4	13	0.981	60.93	59.80	49.04	49	11.12	10.92
5	14	0.974	46.04	44.86	36.79	37	13.92	13.56
6	15	0.980	33.79	33.11	27.15	27	16.56	16.23

(note: initial value in column D = H X J)

H	Majors possessing FMO Experience	180
J	Average percent of personnel serving in career field	0.82
K	Number of major billets filled per year	3

Total number of majors currently in fuels billet	**16.44**	(G_1+G_2+G_3)
Majors with completed 3-year experience	**40.71**	(G_4+G_5+G_6)

Cell	Formula	Value
G8	=H19*H20	147.6
E9	=G8-$H$21	144.6
F9	=E9*D9	138.603
G9	=F9*$H$20	113.654
H9	=G9	113.654
J9	=I9*D9	2.876
E10	=G9-$H$21	110.654
F10	=E10*D10	102.458
G10	=F10*$H$20	84.015
H10	=G10	84.015
I10	=$H$21+J9	5.876
J10	=I10*D10	5.440
E11	=G10-$H$21	81.015
F11	=E11*D11	77.964
G11	=F11*$H$20	63.931
H11	=G11	63.931
I11	=$H$21+J10	8.440
J11	=I11*D11	8.123
E12	=G11-$H$21	60.931
F12	=E12*D12	59.803
G12	=F12*$H$20	49.038
H12	=G12	49.038
I12	=$H$21+J11	11.123
J12	=I12*D12	10.917
E13	=G12-$H$21	46.038
F13	=E13*D13	44.863
G13	=F13*$H$20	36.787
H13	=G13	36.787
I13	=$H$21+J12	13.917
J13	=I13*D13	13.561
E14	=G13-$H$21	33.787
F14	=E14*D14	33.108
G14	=F14*$H$20	27.149
H14	=G14	27.149
I14	=$H$21+J13	16.561
J14	=I14*D14	16.228
M16	=H19*H20	147.6
H23	=SUM(J9:J11)	16.438
H25	=SUM(J12:J14)	40.706

Appendix H: 1-Year FMO Model - Lt Col Billet Experience

		A	B	C	D	E	F	G
Year Group	CYOS	Retention Rate	LTCA minus Billets per year (D_{t-1} - K)	LTCA with Retention Factor (A X B)	LTCA with Broadening Factor (C X J)	Adjusted Lt Cols Available (= D)	Lt Cols in Position (G_{t-1}+k)	Lt Col Billet Experience (F X A)
					32.80			
1	16	0.972	30.80	29.94	24.55	25	2	1.94
2	17	0.934	22.55	21.06	17.27	17	3.94	3.68
3	18	0.984	15.27	15.03	12.32	12	5.68	5.59
4	19	0.973	10.32	10.04	8.23	8	7.59	7.39
5	20	0.806	6.23	5.03	4.12	4	9.39	7.57
6	21	0.782	2.12	1.66	1.36	1	7.57	5.92

(note: initial value in column D = H X J)

H	Lt Cols possessing FMO Experience	40
J	Average percent of personnel serving in career field	0.82
K	Number of Lt Col billets filled per year	2

Total number of Lt Cols currently in fuels billet	**11.22**	(G_1+G_2+G_3)
Lt Cols with completed 3-year experience	**20.87**	(G_4+G_5+G_6)

Cell	Formula	Value
G8	=H19*H20	32.8
E9	=G8-$H$21	30.8
F9	=E9*D9	29.938
G9	=F9*$H$20	24.549
H9	=G9	24.549
J9	=I9*D9	1.944
E10	=G9-$H$21	22.549
F10	=E10*D10	21.061
G10	=F10*$H$20	17.270
H10	=G10	17.270
I10	=$H$21+J9	3.944
J10	=I10*D10	3.684
E11	=G10-$H$21	15.270
F11	=E11*D11	15.025
G11	=F11*$H$20	12.321
H11	=G11	12.321
I11	=$H$21+J10	5.684
J11	=I11*D11	5.593
E12	=G11-$H$21	10.321
F12	=E12*D12	10.042
G12	=F12*$H$20	8.235
H12	=G12	8.235
I12	=$H$21+J11	7.593
J12	=I12*D12	7.388
E13	=G12-$H$21	6.235
F13	=E13*D13	5.025
G13	=F13*$H$20	4.121
H13	=G13	4.121
I13	=$H$21+J12	9.388
J13	=I13*D13	7.567
E14	=G13-$H$21	2.121
F14	=E14*D14	1.658
G14	=F14*$H$20	1.360
H14	=G14	1.360
I14	=J13	7.567
J14	=I14*D14	5.917
H23	=SUM(J9:J11)	11.220
H25	=SUM(J12:J14)	20.871

Appendix I: 2-Year FMO Model - FMO Training

	A	B	C	D	E	F	G	H	I	J	K
1						FMO exp	FMO Exp	FMO exp	FMO Exp	FMO exp	FMO Exp
2		Retention		No Fuels	FMO	Not promoted	Promoted	Not promoted	Promoted	Not promoted	Promoted
3	Year	Rate	CYOS	Experience	Experience	Capt	Capt	Maj	Maj	LTC	LTC
4	2002	1.000	0	138	0						
5	2003	0.978	1	135	0						
6	2004	0.991	2	131	2.97						
7	2005	0.989	3	126	5.91						
8	2006	0.916	4	113	8.16						
9	2007	0.899	5	99		0.06	9.97				
10	2008	0.924	6	89			11.98				
11	2009	0.950	7	81			14.23				
12	2010	0.935	8	73			16.11				
13	2011	0.960	9	67			18.35				
14	2012	0.959	10					0.84	16.74		
15	2013	0.926	11						15.50		
16	2014	0.962	12						14.92		
17	2015	0.981	13						14.64		
18	2016	0.974	14						14.27		
19	2017	0.980	15						13.98		
20	2018	0.972	16							3.76	9.82
21	2019	0.934	17							3.52	9.18
22	2020	0.984	18							3.46	9.03
23	2021	0.973	19							3.37	8.79
24	2022	0.806	20							2.71	7.08
25											
26		Projected Accessions per year				138					
27											
28		Number of FMOs trained per year				3					
29											
30	Total number of CGOs with FMO experience					**87.69**					
31											
32	Total number of FGOs with FMO experience					**150.79**					
33											
34			Rates								
35	Promoted			Not	Promoted						
36											
37	1Lt	1.000		1Lt	0.000						
38	Capt	0.993		Capt	0.007						
39	Maj	0.952		Maj	0.048						
40	Lt Col	0.723		Lt Col	0.277						
41	Col	0.513		Col	0.487						

Cell	Formula	Value	Cell	Formula	Value
E6	=(E5+$F$28)*B6	2.973	A9	=A8+1	2007
E7	=(E6+$F$28)*B7	5.908	A10	=A9+1	2008
E8	=(E7+$F$28)*B8	8.162	A11	=A10+1	2009
F9	=E8*E38	0.057	A12	=A11+1	2010
D5	=D4*B5	134.906	A13	=A12+1	2011
D6	=(D5-$F$28)*B6	130.707	A14	=A13+1	2012
D7	=(D6-$F$28)*B7	126.322	A15	=A14+1	2013
D8	=(D7-$F$28)*B8	112.991	A16	=A15+1	2014
D9	=(D8-$F$28)*B9	98.920	A17	=A16+1	2015
D10	=(D9-$F$28)*B10	88.639	A18	=A17+1	2016
D11	=(D10-$F$28)*B11	81.344	A19	=A18+1	2017
D12	=(D11-$F$28)*B12	73.246	A20	=A19+1	2018
D13	=(D12-$F$28)*B13	67.449	A21	=A20+1	2019
G9	=(E8+F28)*B9*B38	9.968	A22	=A21+1	2020
G10	=(G9+$F$28)*B10	11.984	A23	=A22+1	2021
G11	=(G10+$F$28)*B11	14.232	A24	=A23+1	2022
G12	=(G11+$F$28)*B12	16.111	C5	=C4+1	1
G13	=(G12+$F$28)*B13	18.350	C6	=C5+1	2
H14	=G13*B14*E39	0.844	C7	=C6+1	3
I14	=G13*B14*B39	16.745	C8	=C7+1	4
I15	=I14*B15	15.504	C9	=C8+1	5
I16	=I15*B16	14.920	C10	=C9+1	6
I17	=I16*B17	14.644	C11	=C10+1	7
I18	=I17*B18	14.270	C12	=C11+1	8
I19	=I18*B19	13.983	C13	=C12+1	9
J20	=I19*B20*E40	3.764	C14	=C13+1	10
K20	=I19*B40*B20	9.824	C15	=C14+1	11
J21	=J20*B21	3.517	C16	=C15+1	12
K21	=K20*B21	9.179	C17	=C16+1	13
J22	=J21*B22	3.460	C18	=C17+1	14
K22	=K21*B22	9.031	C19	=C18+1	15
J23	=J22*B23	3.367	C20	=C19+1	16
K23	=K22*B23	8.788	C21	=C20+1	17
J24	=J23*B24	2.713	C22	=C21+1	18
K24	=K23*B24	7.081	C23	=C22+1	19
A5	=A4+1	2003	C24	=C23+1	20
A6	=A5+1	2004	F30	=SUM(E6:E8)+SUM(G9:G13)	87.687
A7	=A6+1	2005	F32	=SUM(I14:I19)+SUM(K20:K24)+SUM(J20:J24)	150.790
A8	=A7+1	2006			

Appendix J: 2-Year FMO Model - Major Fuels Billet Experience

		A	B	C	D	E	F	G
Year Group	CYOS	Retention Rate	MA minus Billets per year (D_{t-1} - K)	MA with Retention Factor (A X B)	MA with Broadening Factor (C X J)	Adjusted Majors Available (= D)	Majors in Position (G_{t-1}+k)	Major Billet Experience (F X A)
					73.80			
1	10	0.959	70.80	67.86	55.65	56	3	2.88
2	11	0.926	52.65	48.75	39.97	40	5.88	5.44
3	12	0.962	36.97	35.58	29.18	29	8.44	8.12
4	13	0.981	26.18	25.69	21.07	21	11.12	10.92
5	14	0.974	18.07	17.61	14.44	14	13.92	13.56
6	15	0.980	11.44	11.21	9.19	9	16.56	16.23

(note: initial value in column D = H X J)

H	Majors possessing FMO Experience	90
J	Average percent of personnel serving in career field	0.82
K	Number of major billets filled per year	3

Total number of majors currently in fuels billet	**16.44**	(G_1+G_2+G_3)
Majors with completed 3-year experience	**40.71**	(G_4+G_5+G_6)

Cell	Formula	Value
G8	=H19*H20	73.8
E9	=G8-$H$21	70.8
F9	=E9*D9	67.864
G9	=F9*$H$20	55.648
H9	=G9	55.648
J9	=I9*D9	2.876
E10	=G9-$H$21	52.648
F10	=E10*D10	48.748
G10	=F10*$H$20	39.974
H10	=G10	39.974
I10	=$H$21+J9	5.876
J10	=I10*D10	5.440
E11	=G10-$H$21	36.974
F11	=E11*D11	35.581
G11	=F11*$H$20	29.177
H11	=G11	29.177
I11	=$H$21+J10	8.440
J11	=I11*D11	8.123
E12	=G11-$H$21	26.177
F12	=E12*D12	25.692
G12	=F12*$H$20	21.067
H12	=G12	21.067
I12	=$H$21+J11	11.123
J12	=I12*D12	10.917
E13	=G12-$H$21	18.067
F13	=E13*D13	17.606
G13	=F13*$H$20	14.437
H13	=G13	14.437
I13	=$H$21+J12	13.917
J13	=I13*D13	13.561
E14	=G13-$H$21	11.437
F14	=E14*D14	11.207
G14	=F14*$H$20	9.190
H14	=G14	9.190
I14	=$H$21+J13	16.561
J14	=I14*D14	16.228
M16	=H19*H20	73.800
H23	=SUM(J9:J11)	16.438
H25	=SUM(J12:J14)	40.706

Appendix K: 2-Year FMO Model - Lt Col Fuels Billet Experience

		A	B	C	D	E	F	G
Year Group	CYOS	Retention Rate	LTCA minus Billets per year (D_{t-1} - K)	LTCA with Retention Factor (A X B)	LTCA with Broadening Factor (C X J)	Adjusted Lt Cols Available (= D)	Lt Cols in Position (G_{t-1}+k)	Lt Col Billet Experience (F X A)
					32.80			
1	16	0.972	30.80	29.94	24.55	25	2	1.94
2	17	0.934	22.55	21.06	17.27	17	3.94	3.68
3	18	0.984	15.27	15.03	12.32	12	5.68	5.59
4	19	0.973	10.32	10.04	8.23	8	7.59	7.39
5	20	0.806	6.23	5.03	4.12	4	9.39	7.57
6	21	0.782	2.12	1.66	1.36	1	7.57	5.92

(note: initial value in column D = H X J)

H	Lt Cols possessing FMO Experience	40
J	Average percent of personnel serving in career field	0.82
K	Number of Lt Col billets filled per year	2

Total number of Lt Cols currently in fuels billet	**11.22**	(G_1+G_2+G_3)
Lt Cols with completed 3-year experience	**20.87**	(G_4+G_5+G_6)

Cell	Formula	Value
G8	=H19*H20	32.8
E9	=G8-$H$21	30.8
F9	=E9*D9	29.938
G9	=F9*$H$20	24.549
H9	=G9	24.549
J9	=I9*D9	1.944
E10	=G9-$H$21	22.549
F10	=E10*D10	21.061
G10	=F10*$H$20	17.270
H10	=G10	17.270
I10	=$H$21+J9	3.944
J10	=I10*D10	3.684
E11	=G10-$H$21	15.270
F11	=E11*D11	15.025
G11	=F11*$H$20	12.321
H11	=G11	12.321
I11	=$H$21+J10	5.684
J11	=I11*D11	5.593
E12	=G11-$H$21	10.321
F12	=E12*D12	10.042
G12	=F12*$H$20	8.235
H12	=G12	8.235
I12	=$H$21+J11	7.593
J12	=I12*D12	7.388
E13	=G12-$H$21	6.235
F13	=E13*D13	5.025
G13	=F13*$H$20	4.121
H13	=G13	4.121
I13	=$H$21+J12	9.388
J13	=I13*D13	7.567
E14	=G13-$H$21	2.121
F14	=E14*D14	1.658
G14	=F14*$H$20	1.360
H14	=G14	1.360
I14	=J13	7.567
J14	=I14*D14	5.917
H23	=SUM(J9:J11)	11.220
H25	=SUM(J12:J14)	20.871

Bibliography

Barker, Michael D., AFLMA/LGR. *Logistics Officer Handbook* (2003 Update). Washington: HQ USAF, 28 August 2003.

Cascio, Wayne F. *Managing Human Resources* (6th Edition). New York: McGraw-Hill Companies, 2003.

Costello, Robert B. *Random House Webster's College Dictionary*. New York: Random House, 1992.

Department of the Air Force. *Officer Classification*. AFMAN 36-2105. Washington: HQ USAF, 30 April 2004.

Department of the Air Force. *21RX: Logistics Readiness Officer Career Field Education and Training Plan*. Washington: HQ USAF, 18 November 2002.

Department of the Air Force. *Classifying Military Personnel (Officer and Enlisted).* AFI 36-2101. Washington: HQ USAF, 30 April 2001.

Department of the Air Force. *Fuels Management*. AFI 23-201. Washington: HQ USAF, 1 August 1999.

Department of the Air Force. *You and Your Promotions-The Air Force Officer Promotion Program.*. AFP 36-2506. Washington: HQ USAF, 1 September 1997.

Department of the Air Force. *Management of Government Property in Possession of the Air Force*. AFI 23-111. Washington: HQ USAF, 1 February 1996a.

Department of the Air Force. *Officer Professional Development*. AFI 36-2611. Washington: HQ USAF, 1 April 1996b.

Hall, Lt Col Russ, CLR Implementation Officer. "CSAF Logistics Review (CLR)", Briefing at IL/LG MAJCOM Conference. 28 November 2001.

Hellriegel, Don and others. *Organizational Behavior* (3rd edition). St. Paul, Minnesota: West Publishing Company, 1983.

HQ USAF. "CSAF Logistics Review (CLR)/Wing Organization Decisions." Electronic Message. 1147, 22 April 2002a.

HQ USAF. *"Program Action Directive 02-05: Implementation of the Chief of Staff of the Air Force Direction to Establish a New Combat Wing Organization Structure."* Washington: HQ USAF, 29 June 2002b.

HQ USAFR. "Logistics Readiness Officer Readiness Training." Memorandum for Supply, Transportation, and Logistics Plans Officers. 2002.

Ivancevich, John M. and William F. Glueck. *Foundations of Personnel* (Revised Edition). Plano, Texas: Business Publications Inc, 1983.

Leedy, Paul D. and Jeanne Ellis Ormrod. *Practical Research: Planning and Design*. Upper Saddle River, New Jersey: Prentice-Hall, 2001.

Pittman, Maj Andrew. "Fuels Officer Professional Development," Briefing at HQ USAF/ILSP. 30 January 2001.

Ragsdale, Cliff T. "Spreadsheet Modeling & Decision Analysis: A Practical Introduction to Management Science", powerpoint presentation. 2004.

Salant, Priscilla and Don A. Dillman. *How to Conduct Your Own Survey*. New York: John Wiley & Sons, Inc 1994.

Shirriff, Adam J. "Transformation of Logistics Career Field," *Air Force Journal of Logistics*, 27: 12, 43 (Fall 2003).

Spackman, Capt Leon C. *Fuels Branch Reorganization: A Study of the Fuels Officer and the Fuels Organization*. MS Thesis AFIT/GLM/LSM/85S-72. School of Systems and Logistics, Air Force Institute of Technology (AU), Wright-Patterson AFB, OH, September 1985 (AAK0385).

Zettler, Lt Gen Michael E. "Changing Air Force Logistics: Chief's Logistics Review," *Air Force Journal of Logistics*, Vol XXV, number 2 (Summer 2001).

Vita

Captain Keith A. Lewis graduated from Pendleton High School, Anderson, South Carolina, in May 1984. He enlisted in the U.S. Air Force in August 1987. After completing basic military training at Lackland AFB, Texas and technical training at Sheppard AFB Texas, he was assigned as a Pharmacy Technician, 347th Medical Group, Moody AFB, Georgia. In December 1996, he was assigned to the 347th Mission Support Squadron, Moody AFB, Georgia as an Airman Leadership School instructor. He earned a Bachelor of Science degree in Vocational Education through Valdosta State University. He attained the rank of Technical Sergeant before being selected for Officer Training School in September 2000.

After receiving his commission, Captain Lewis was assigned to the 436th Supply Squadron, Dover AFB, Delaware, as a Supply officer. While at Dover, he served as the Fuels Management Flight Commander. Then following the formation of the 436th Logistics Readiness Squadron in November 2002, he served as the OIC for the Cargo Movement Section. In September 2003, he entered the Graduate Logistics Management program at the Air Force Institute of Technology. Upon graduation, he will be assigned to Headquarters, Air Force Material Command, Wright-Patterson AFB, Ohio.

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Graduate School of Engineering and Management (AFIT/EN)
2950 Hobson Street, Building 642
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HQ AF/ILGM
Attn: Maj Rose Thorne
1030 Air Force Pentagon DSN: 695-9783
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14. ABSTRACT

A major initiative resulting from the 1999 Chief of Staff of the Air Force Logistics Review (CLR) was the development of the logistics readiness officer (LRO) career field, which combined three previous logistics fields; supply, transportation, and logistics plans. As a result, the training for a LRO promotes logistics function familiarity rather than expertise. This is of particular concern in the critical area of fuels management. Fuel is an absolute necessity in all military operations and its proper management is vital to mission success. The objective of this research is to determine the impact due to the LRO career field implementation on the Air Forces' ability to field LROs with fuels management experience to fill advanced positions. An interview questionnaire with officers with advanced fuels position experience identified the requirements of advanced fuels positions. Spreadsheet models predicted the Air Force's ability to fill advanced fuels positions from a manning perspective. The results of this research indicate the Air Force will be able to fill advanced fuels positions from a manning perspective. The interview results indicate that LROs in the future will not possess the experience or education required to fill advanced fuels positions. The results presented in this research provide insight on how to manage the important resource of logistics officers with fuels management expertise.

15. SUBJECT TERMS

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U	U	U	UU	107	(937) 255-6565, ext 4367; e-mail: Marvin.Arostegui@afit.edu

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