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Air Force Materiel Command Reorganization Analysis

Final Report

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RAND PROJECT AIR FORCE

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Preface

The Budget Control Act of 2011 (Pub L. 112-25) directed cuts in defense spending. For the U.S. Air Force, these cuts equate to initial reductions of 16,500 civilian authorizations, with nearly 4,500 coming from Air Force Materiel Command (AFMC). Given the requirement to reduce civilian manpower, the AFMC leadership team undertook a major reorganization to achieve the required reductions while implementing the Office of the Secretary of Defense product support business model, which provides cradle-to-grave weapon system program management. Congress directed the Secretary of the Air Force to have a federally funded research and development center review the proposed reorganization. The purpose of this analysis is to provide an independent review and assessment of the reorganization proposed by AFMC as required by the National Defense Authorization Act for 2012. The resulting assessment focuses on how the reorganization would affect product development (including support-system design) and operations support (depot maintenance and Air Force supply chain operations). In addition, it suggests alternatives and other areas for further AFMC process improvement.

The research reported here was sponsored by the Secretary of the Air Force and conducted within the Resource Management Program of RAND Project AIR FORCE as part of the project "Evaluation of AFMC Reorganization."

This monograph will be of interest to all weapon system life-cycle management stakeholders, including members of Congress, congressional staffs, and senior leaders in the U.S. Department of Defense, Air Force, and other services and their staffs.

RAND Project AIR FORCE

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Summary

Background

The 2011 Budget Control Act reduces U.S. Department of Defense (DoD) spending by $487 billion over the next decade, and the Office of the Secretary of Defense (OSD) Resource Management Decision 703A2 directs that civilian staffing levels for all services return to fiscal year (FY) 2010 levels. This meant that the U.S. Air Force needed to reduce its civilian operations and maintenance (O&M) authorizations by 16,500; it chose to distribute these reductions across the force. The Air Force Materiel Command's (AFMC's) share of the reductions amounted to 4,500 authorizations out of approximately 22,000 civilian O&M positions. This directive, coupled with a reversal of OSD and Headquarters Air Force mandates to insource and strengthen acquisition skills, led AFMC to fundamentally reexamine how it operates, and the command published a plan for reorganization in November 2011. In the Defense Authorization Act for FY 2012, Congress directed the Secretary of the Air Force to have a federally funded research and development center provide an independent review of the proposed reorganization.

Purpose

In late January 2012, the Secretary of the Air Force asked RAND Project AIR FORCE (PAF) to conduct the required independent review of AFMC's proposed reorganization, as required by the Defense Authorization Act for FY 2012, and to accomplish the following five tasks:

- Describe current functional responsibilities, manpower authorizations, and disposition in the proposed restructure, including an assessment of life-cycle costs.
- Provide an independent assessment of how realignments would likely affect life-cycle management, weapon system sustainment, and support to the warfighter.

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- Examine how the Air Force should be organized to best conduct life-cycle management and weapon system sustainment, with any analysis of costs and savings subject to the consideration of overall readiness.
- Recommend alternatives for meeting these objectives.
- Provide a briefing and a written report on the analysis.[1]

The time available to complete these tasks was relatively short. As specified in Section 326 of the National Defense Authorization Act for FY 2012, the analysis was limited to how the reorganization would affect product development/support-system design and operations support (depot maintenance and Air Force supply chain operations).[2] We did not examine how the reorganization affected management of nuclear weapons, developmental testing, or laboratory and basic research.

Results

Key Attributes of the Reorganization

The reorganization reduces AFMC's 12 centers to five, including two new centers commanded by three-star generals: a life-cycle management center at Wright-Patterson Air Force Base (AFB), Ohio, and a sustainment center at Tinker AFB, Oklahoma. The Air Force Life Cycle Management Center (AFLCMC) would support product development/support-system design and planning activities executed by the service acquisition executive (SAE) through program executive officers (PEOs), system program managers (SPMs), and product support managers (PSMs). AFLCMC responsibilities include supporting the SAE by providing trained personnel to serve as PEOs, SPMs, and PSMs and developing the processes, providing the facilities and information systems, and fulfilling other organize, train, and equip functions in support of the SAE. The Air Force Sustainment Center (AFSC) would manage all depot maintenance and Air Force supply chain activities. Under the reorganization, the AFSC would supervise the activities of three air logistics complexes, a supply chain management wing, and a supply chain operations wing. The plan also calls for two new organizations to be created at the air logistics complexes: aerospace sustainment directorates (ASDs) and strategic planning units (SPUs).

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[1] Appendix A lists both the congressional requirements and the PAF taskings.

[2] By *product development and support-system design*, we mean all the functions associated with the design, development, fielding, and modification of weapon systems, subsystems, and their components, including functions to ensure reliability, maintainability, and sustainability (for example, engineering design); initial support concept development; and system fielding and weapon system beddown planning. We limit *operations support* in this analysis to those functions associated with depot maintenance and Air Force supply chain management. These functions include system and subsystem overhaul and modifications to support the operation of the system over its lifetime, as well as supply chain management operations to provide component parts to operating locations.

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RAND Project AIR FORCE Findings

The PAF research team analyzed AFMC's organizational change request and unit manning documents,[3] confirming that 1,051 spaces would be eliminated and that these eliminations would yield annual savings of approximately $109 million. Our analysis also confirmed that AFMC would retain all critical line functions. As part of the organizational realignment, and in implementing the OSD product support business model, all program execution personnel report to the SAE. Formerly, SPMs of mature systems reported to the commanders of the air logistics centers (renamed air logistics complexes in the new organization). In addition, all depot maintenance and supply chain operations align under the AFSC commander.

Our analysis also indicated that the reorganization creates opportunities to achieve key product development/support-system design and operations support goals, including the potential to standardize core "best-practice" product development processes, streamline execution, and introduce support considerations early in product development—all long-standing issues that have persisted under many organizational structures. Additionally, the reorganization creates opportunities to improve operations support efficiencies by standardizing maintenance and Air Force supply chain best practices across all air logistics complexes and by facilitating command and control of Air Force supply chain operations.

At the same time, the reorganization creates some challenges. For example, it raises questions about the horizontal integration and collaboration between the SPMs (who are in the SAE execution management reporting chain) and maintenance and supply chain personnel (who are in the AFSC reporting chain). It also raises concerns about the career management and leadership development of personnel in the product development/support-system design and operations support reporting chains. Finally, we note that it expands the workload for PEOs and raises concerns about their training and experience in supervising new product support functions.

Our analysis of the reorganization indicates that the Air Force has recognized these challenges and has taken several steps to mitigate their potential effects. For example, it has developed mechanisms to foster horizontal integration, including establishing a new ASD at each air logistics complex to maintain integration across program management, depot maintenance, and supply chain personnel. Furthermore, SPMs will continue to change their geographical location (from the AFLCMC or an AFLCMC operating location to an air logistics complex) as weapon systems mature.

Under the previous organization, both formal and informal communication channels were required to support life-cycle management, and that will not change under the new organization. The formal channels remain in place, and, to the extent

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[3] Air Force Materiel Command, *Organizational Change Request for Air Force Materiel Command*, OCR 12-01, February 6, 2012. The PAF research team also received a file developed from the February 28, 2011 end-of-month AFMC unit manpower document using FY 2012 totals, which was the baseline for the reorganization.

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possible, the Air Force is mapping informal channels to try to ensure that they remain intact.

Additionally, the Air Force has addressed issues of career and leadership development for those involved with operations support. However, the same issues for the PEO and SPM appear to warrant examination, as does the workload of some PEOs. The Air Force might wish to consider delegating some program execution activities to SPMs.

Our analysis was unable to judge the effects of the reorganization on support to the warfighter and efficiencies associated with product development/support-system design and operations support. Furthermore, the effectiveness and efficiencies of the proposed organization are, at this point, unknown and will depend on how the reorganization is implemented over time. Many factors influence weapon system support beyond the characteristics of the organization chosen to support such systems over their life cycles, including leadership, funding, and unanticipated events. Policy, processes, and incentives should be put in place to motivate integrated and balanced decision-making. Accordingly, we suggest that the Air Force develop and use a suite of metrics to track performance against goals. These metrics should include applicable existing metrics, as well as new metrics, to capture such characteristics as productivity, aircraft availability, supply chain performance, program execution, and the development of the workforce. In particular, processes that depend on integrated SPM, maintenance, and supply chain support warrant close monitoring. If the metrics indicate deterioration, the Air Force should ascertain the root cause of the decline and adjust accordingly.

Options for Consideration

We used selected insights from the academic literature on organizational design to assess the reorganization. Both theory and business reengineering literature identify well-understood goals as essential to designing organizations and focusing their efforts. The business reengineering literature indicates that process reengineering can lead to organizations that are more likely to achieve their goals. We note that the Air Force's doctrine, organization, training, materiel, leadership and education, personnel and facilities (DOTMLPF) construct provides a useful framework to ensure that all key aspects of the reorganization receive consideration. Finally, the literature points out that all organizational designs will present both opportunities and challenges.

We developed four options to address AFMC's operational-level product development/support-system design and operations support goals, opportunities, and challenges. All build on the current reorganization and include processes for the following:

1. improving enterprise support-system design planning
2. enforcing enterprise support-system design planning guidance early in the acquisition process

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3. standardizing best-practice product development and operations support processes
4. improving command and control support to the warfighter.

Each of these process improvements will result in modifications to the proposed organizational structure. Furthermore, the options are neither mutually exclusive nor interdependent.

Conclusions and Recommendations

Our analysis led to the following conclusions:

- The estimates for AFMC reorganization-authorized civilian positions and cost reductions are consistent with the findings of our analysis.
- All critical line functions appear to remain intact.
- The reorganization brings both opportunities and challenges; the impact of the reorganization on effective warfighter support and process efficiencies is currently unknown and will be affected by the implementation approach. In addition, many factors outside the reorganization will also determine effectiveness and efficiencies—for example, leadership focus, resource constraints, and other ongoing process improvements.
- The four options that we have identified here offer the potential to improve the effectiveness (support to the warfighter) and efficiency of operations.

Our recommendations are as follows:

- Concentrate on process improvements in implementing the AFMC reorganization.
- Measure the proposed reorganization for effectiveness and efficiency, perform root cause analyses, address any problems identified, and continuously improve processes.
- Consider the four options when implementing the reorganization.

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Responsibility for the content of this monograph, analyses, and conclusions lies solely with the authors.

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Abbreviations

A&L	Acquisition and Logistics
AAC	Air Armament Center
AAF	Army Air Forces
ABW	air base wing
ACAT	acquisition category
ACE	Acquisition Center of Excellence
ACS	agile combat support
AEDC	Arnold Engineering and Development Center
AFALD	Air Force Acquisition Logistics Division
AFB	Air Force Base
AFFTC	Air Force Flight Test Center
AFGLSC	Air Force Global Logistics Support Center
AFI	Air Force instruction
AFLC	Air Force Logistics Command
AFLCMC	Air Force Life Cycle Management Center
AFMC	Air Force Materiel Command
AFNWC	Air Force Nuclear Weapons Center
AFRL	Air Force Research Laboratory
AFSAC	Air Force Security Assistance Center
AFSC	Air Force Sustainment Center

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AFTC	Air Force Test Center
AFSO21	Air Force Smart Operations for the 21st Century
AIP	Acquisition Improvement Program
ALEX	Agile Logistics EXperiment
AOR	area of responsibility
ARDC	Air Research and Development Command
ASC	Aeronautical Systems Center
ASD	aerospace sustainment directorate
BOS	Base Operating Support
C2	command and control
CFLI	core function lead integrator
C-NAF	component Numbered Air Force
COA	course of action
COE	center of excellence
CONOPS	concept of operations
CRF	centralized repair facility
D&SWS	Develop and Sustain Warfighting Systems
DAC	designated acquisition commander
DAO	designated acquisition official
DMRD	Defense Management Report Decision
DoD	U.S. Department of Defense
DOTMLPF	doctrine, organization, training, materiel, leadership and education, personnel and facilities
ECSS	Expeditionary Combat Support Systems
eLog21	Expeditionary Logistics for the 21st Century
ESC	Electronic Systems Center
FOA	field operating agency
FY	fiscal year

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ILCM	integrated life-cycle management
IPT	integrated product team
IWSM	integrated weapon system management
MAJCOM	major command
MRSP	Maintenance Requirements Supportability Process
MSC	Mission Support Center (notional)
O&M	operations and maintenance
OC-ALC	Oklahoma City Air Logistics Center
OCR	organization change request
OEM	original equipment manufacturer
OO-ALC	Ogden Air Logistics Center
OPLAN	operations plan
OSC	office symbol code
OSD	Office of the Secretary of Defense
OSS&E	operational safety, suitability, and effectiveness
PAF	RAND Project AIR FORCE
PEO	program executive officer
PMRT	program management responsibility transfer
PSBM	product support business model
PSM	product support manager
R&D	research and development
RMD	Resource Management Decision
RNI	repair network integration
SAE	service acquisition executive
SCMG	supply chain management group
SCMW	supply chain management wing
SCOW	supply chain operations wing

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SPM	system program manager
SPU	strategic planning unit
TCA	transaction cost analysis
TRC	technology repair center
UMD	unit manpower document
WR-ALC	Warner Robins Air Logistics Center
WSPO	weapon system project office

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CHAPTER ONE

Background, Purpose, and Analytic Approach

Background

The Budget Control Act of 2011 (Pub. L. 112-25) directed the U.S. Department of Defense (DoD) to reduce its future spending by approximately $487 billion over the next decade.[1] In turn, the Office of the Secretary of Defense (OSD) issued Resource Management Decision (RMD) 703A2, which called for all services to return to their fiscal year (FY) 2010 civilian staffing levels. This decision equated to an initial reduction of 16,500 civilian operations and maintenance (O&M) authorizations across the Air Force. Air Force senior leaders then met and agreed on how to distribute the necessary reductions across major commands (MAJCOMs). Air Force Materiel Command (AFMC) was tasked to cut 4,500 of its approximately 22,000 civilian O&M authorizations.

When the directives came from OSD to reduce O&M manpower, AFMC's strategic goals ran counter to the directives: It was in the middle of an existing effort to hire more civilians. Specifically, AFMC was reducing the number of contractors in the command by insourcing and hiring civilians, thus increasing the civilian end strength in support of OSD-directed RMD 802.[2] It was also supporting Acquisition Excellence initiatives by hiring personnel with specific skill sets to strengthen the acquisition workforce.[3] With the OSD-led shift in direction, AFMC had to reevaluate how it would conduct business.

AFMC established two major ground rules for achieving the manpower reductions. First, it would maintain critical mission capabilities. The required manpower reductions would not be spread equally across all mission or functional areas. Man-

[1] U.S. Department of Defense, *Defense Budget Priorities and Choices*, Washington, D.C., January 2012, p. 1.

[2] RMD 802 directed contractor reductions and civilian end-strength increases by FY 2015.

[3] Acquisition Excellence initiatives that were in progress aimed to improve the coherent life-cycle management structure, develop and manage key people, rebuild key processes, and shorten the reporting chain. Specific skill sets targeted included cost analysis, system engineering, and earned value management analysis. (Gary E. Christle, Dan Davis, and Gene Porter, *Air Force Acquisition: Return to Excellence*, Alexandria, Va.: CNA, February 2009).

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power directly involved in producing product development/support-system design or operations support outputs would not be cut.[4] The reductions would come largely from overhead and administrative functions. In the process, AFMC aimed to group functions by major mission area and align authorities for executing those missions.

Second, personnel would not be moved, and the number of bases would not change. Manpower authorizations were realigned and reporting chains changed, but personnel were not assigned to different physical locations. Virtual organizations would be leveraged to realign reporting with appropriate mission-area commanders.

One of the mission areas aligned during this reorganization was product development, including the design of the operations support system (see Figure 1.1). AFMC took the opportunity to implement the OSD product support business model (PSBM) in a specific way.[5] The AFMC proposal has system program managers (SPMs) for all systems report to program executive officers (PEOs) who, in turn, report to the service acquisition executive (SAE). Product support managers (PSMs) report to SPMs. SPMs and PSMs are responsible for product development and the design of support systems. PSMs are supported by a network of product support integrators and product support providers—contract, organic, or through a partnership—to provide cradle-to-grave product support in the manner prescribed in DoD directives.[6] Figure 1.1 shows these product support arrangements.

As the reorganization plans were developed, AFMC worked with congressional delegations from the states affected by the plans. AFMC released its proposed reorganization plan in November 2011. At that time, some members of Congress, still concerned about the reorganization, inserted language into the National Defense Authorization Act for FY 2012, House Resolution 1540, Section 326, in December 2011 that mandated an independent review of the plan. The bill specifically required the following:

> The Secretary of the Air Force shall enter into an agreement with a federally funded research and development center to submit to the congressional defense

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[4] By *product development and support-system design*, we mean all the functions associated with the design, development, fielding, and modification of weapon systems, subsystems, and their components, including functions to ensure reliability, maintainability, and sustainability (for example, engineering design); initial support concept development; and system fielding and weapon system beddown planning. We limit *operations support* in this analysis to only those functions associated with depot maintenance and Air Force supply chain management. These functions include system and subsystem overhaul and modifications to support the operation of the system over its lifetime, as well as supply chain management operations to provide component parts to operating locations.

[5] The proposed reorganization eliminates the designated acquisition official (DAO) and moves all AFMC-assigned SPMs and PSMs under the PEO. The guidance does not require this and, in fact, allows the services to have SPMs and PSMs report to a DAO. The implementation of the PSBM and the Air Force Life Cycle Management Center are discussed in detail in Chapter Two.

[6] Pub. L. 111-84, National Defense Authorization Act for Fiscal Year 2010, October 28, 2009; U.S. Department of Defense, *Product Support Manager Guidebook*, Washington, D.C., April 2011.

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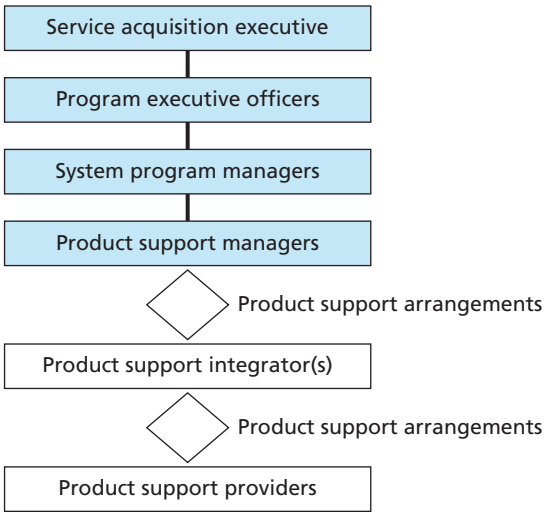
committees, not later than 180 days after the date of the enactment of this Act, a report on the alignment, organizational reporting, military command structure, and performance rating of Air Force system program managers, sustainment program managers, and product support managers at Air Logistics Centers or Air Logistics Complexes.[7]

Purpose

In January 2012, the Secretary of the Air Force asked RAND Project AIR FORCE (PAF) to conduct the analysis required by Congress. The purpose of the analysis was to provide an independent review and assessment, as required by the National Defense Authorization Act for FY 2012, of the reorganization proposed by AFMC in response to the mandated budget reductions. As part of the analysis, we suggest process improvements to improve warfighter support and efficiencies associated with product development/support-system design and operations support. We also suggest organizational options that can facilitate the implementation of these process improvements.

Figure 1.1
OSD Product Support Business Model



NOTE: Product support arrangements are the functional documents that enact and implement the relationships across this framework.

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[7] See the entire requirement as stated in the National Defense Authorization Act for Fiscal Year 2012, HR 1540, Section 326 in Appendix A.

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This monograph focuses on five key tasks based on the requirements outlined in the National Defense Authorization Act for FY 2012:

1. Describe current functional responsibilities, manpower authorizations, and disposition in the proposed restructuring, including an assessment of life-cycle costs.
2. Provide an independent assessment of how realignments would likely affect life-cycle management, weapon system sustainment, and support to the warfighter.
3. Examine how the Air Force should be organized to best conduct life-cycle management and weapon system sustainment, with any analysis of costs and savings subject to the consideration of overall readiness.
4. Recommend alternatives for meeting these objectives.
5. Provide a briefing and a written report on the analysis.[8]

The AFMC reorganization is a large undertaking with many diverse characteristics and effects. In response to the congressional language, we limited the scope of our analysis to only those parts of the reorganization that will affect product development and the associated development of support system and operations support capabilities, specifically those functions associated with depot maintenance and Air Force supply chain activities. Thus, we analyzed approximately 1,000 of the 4,500 civilian O&M authorizations that AFMC had to cut. We did not examine the functions or manpower reductions associated with nuclear capabilities, testing, or laboratory and basic research.[9] The other 3,500 civilian O&M cuts come predominantly from base operations and other areas tied to other initiatives or programmatic reductions.

Analytic Approach

Our analytic approach is shown in Figure 1.2. On the left side of the figure are the constraints considered by AFMC as it developed its proposed organizational structure. Several considerations shaped the proposed restructuring: fiscal limitations that will likely continue well into the future; the changing force structure as new systems are fielded and older systems are retired; laws, regulations, and resource (other than manpower) constraints; and the need to provide effective and efficient support to the warfighter. The proposed AFMC organization, shown in the middle, was developed considering these environmental factors.

The boxes on the right represent RAND's analysis. We took the organizational structure developed by AFMC and independently assessed the manpower assignments

[8] Appendix A lists both the congressional requirements and the PAF taskings.

[9] Nor did we consider space functions as part of this analysis since the scope was limited to AFMC.

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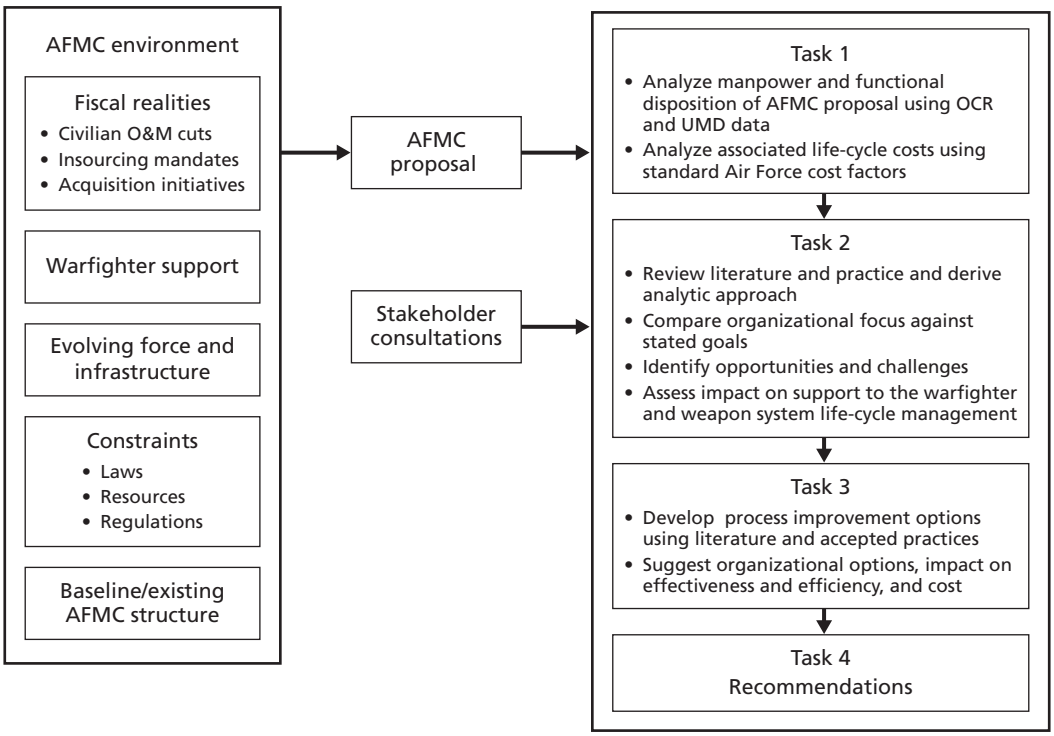
Figure 1.2
Analytic Approach



NOTE: OCR = Organization change request. UMD = Unit manpower document.
RAND *MG1219-1.2*

and life-cycle costs.[10] Then, we reviewed literature and applicable proven practices to derive an analytic approach with which to assess the proposed organizational structure. Using that analytic approach, we compared the proposed structure to the goals for the organization and, with input from key stakeholders, identified potential opportunities and challenges. We also assessed the impact of the reorganization on support to the warfighter and life-cycle management. We used selected insights from accepted academic theory, proven practice, regulations, and policy—in organization, systems, economic, and control theory—to develop alternative process options, evaluate risks, suggest mitigation strategies, and assess effects on the warfighter.[11] The analysis focused on the areas shown on the right side of the figure.

[10] We analyzed only manpower authorizations that had been realigned or eliminated as of the February 6, 2012, data provided by AFMC.

[11] See Appendix C for an annotated bibliography of the laws, government documents, Air Force policies, reports, reviews, and academic literature used in our analysis.

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We shared our analytic approach with many senior leaders and other interested parties throughout the analysis. We spoke with staff from Headquarters Air Force and the Office of the Secretary of the Air Force. We also met with air logistics center (ALC) and product center personnel and spoke with congressional staff and military liaisons to ensure that we understood their perspectives as we responded to the National Defense Authorization Act requirements. The complete list of stakeholders with whom we spoke can be found in Appendix D.

Organization of This Monograph

In the chapters that follow, we present our analysis of the proposed AFMC reorganization plan. In Chapter Two, we present an overview of both the current and proposed organizational structures, with a detailed description of the proposed product development/support-system design and operations support functions and organizations. Chapter Three describes the disposition of manpower authorizations proposed in the restructured organization and an assessment of the authorizations cut and life-cycle costs saved by the realignment. In Chapter Four, we describe life-cycle management functions in the current and proposed organizations and then discuss how the proposed reorganization may affect life-cycle management effectiveness and efficiencies. Chapter Five presents further opportunities for strengthening AFMC's ability to achieve its product development/support-system design and operations support objectives. Finally, our conclusions and recommendations are presented in Chapter Six.

There are six appendixes to this document:

A. National Defense Authorization Act for Fiscal Year 2012 Requirements and RAND Project AIR FORCE Project Description Taskings
B. A History of Air Force Life-Cycle Management
C. Annoted Bibliography of Related Work
D. Interview List for AFMC Reorganization Analysis
E. Civilian Pay Calculations
F. Special Interest Topic: Further Consolidate Mission-Area Support.

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CHAPTER TWO

Air Force Materiel Command's Organizational Structure

In this chapter, we provide a brief overview of AFMC's current and proposed organizational structures. We then provide more detail on how the proposed reorganization addresses weapon system life-cycle management responsibilities.

Current Organizational Structure

AFMC was created in July 1992 from a reorganization merging Air Force Logistics Command and Air Force Systems Command. The command is currently organized into 12 centers, each of which reports to the AFMC commander (see Figure 2.1).

Under the current construct, the AFMC commander has a large organizational span of control, with product development/support-system design spread among seven centers: the Air Armament Center (AAC), Aeronautical Systems Center (ASC), Electronic Systems Center (ESC), Oklahoma City Air Logistics Center (OC-ALC), Ogden Air Logistics Center (OO-ALC), Warner Robins Air Logistics Center (WR-ALC), and Air Force Security Assistance Center (AFSAC).[1] Depot maintenance is currently managed at three air logistics centers: Oklahoma City, Ogden, and Warner Robins. Supply chain operations are managed in a separate center, the Air Force Global Logistics Support Center (AFGLSC). All 12 centers have their own staffs.

Proposed Reorganization

Driven by the civilian reductions mandated in RMD 703, AFMC plans to combine many of the 12 centers' functions into five centers. Each center will be responsible for one of AFMC's five mission areas: product development/support-system design, operations support, research and technology development, developmental testing, and nuclear weapon support (see Figure 2.2).

[1] AFSAC oversees foreign military sales and support.

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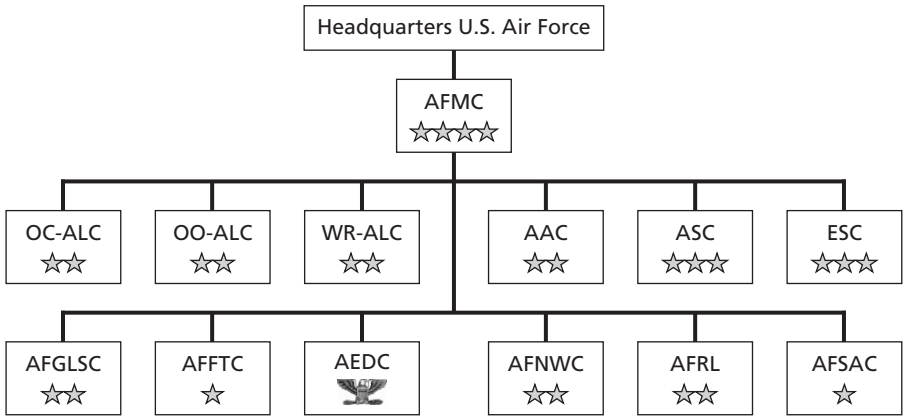
Figure 2.1
Current AFMC 12-Center Construct



NOTE: AEDC = Arnold Engineering and Development Center. AFFTC = Air Force Flight Test Center. AFNWC = Air Force Nuclear Weapons Center. AFRL = Air Force Research Laboratory.

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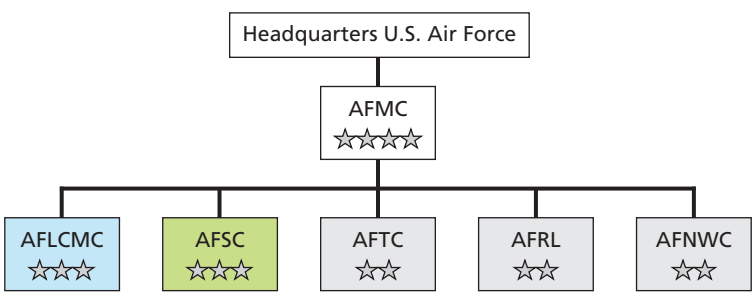
Figure 2.2
AFMC-Proposed Five-Center Construct



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The proposed five-center construct creates three new centers: the Air Force Life Cycle Management Center (AFLCMC), the Air Force Sustainment Center (AFSC), and the Air Force Test Center (AFTC). The Air Force Research Laboratory (AFRL) and Air Force Nuclear Weapons Center (AFNWC) remain intact. Thus, the new construct reduces the AFMC commander's organizational span of control from 12 centers to five; consolidates all organize, train, and equip functions in support of SAE/PEO product development/support-system design activities under a single commander in the AFLCMC; and combines all operations support functions (depot maintenance and supply chain operations), including organize, train, and equip functions, in the AFSC. It eliminates some staff authorizations and consolidates others into the new

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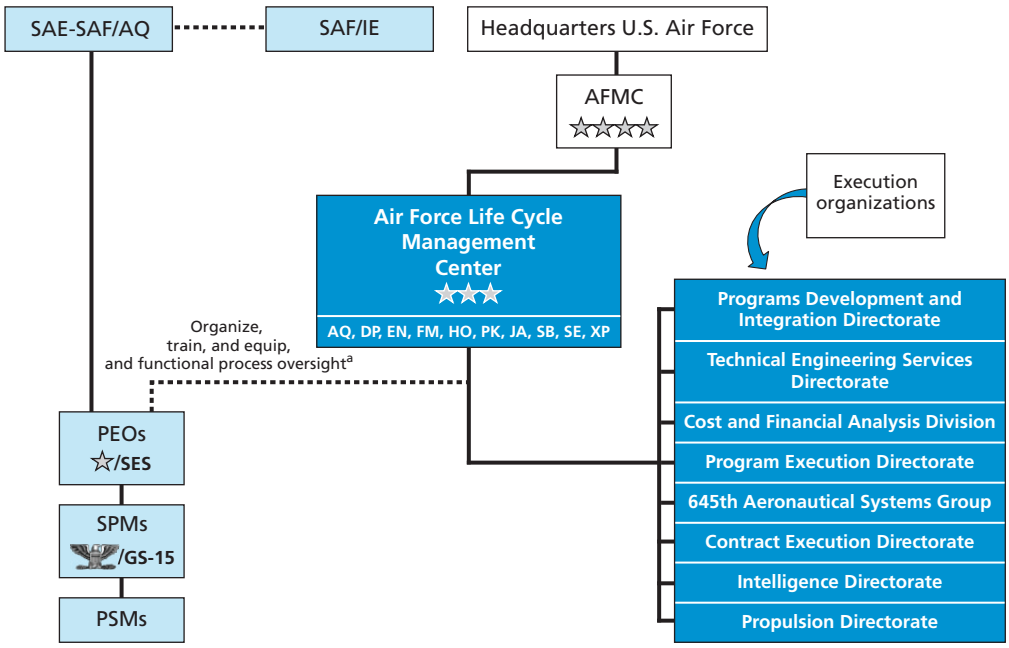
center staffs (that is, for the AFLCMC and AFSC) and realigns management reporting chains throughout the command.

The Air Force Life Cycle Management Center

In the new construct, the AFLCMC will combine product development/support-system design from the AAC, ASC, and ESC and eliminate the DAO structure (see Figure 2.3). One of the intents is for the AFLCMC to develop standard processes that will streamline Air Force product development/support-system design to meet operational needs in an efficient and timely manner. The AFLCMC will have organize, train, and equip responsibility for all AFMC-assigned PSMs, SPMs, PEOs and the personnel supporting them in meeting Air Force life-cycle management responsibilities. Furthermore, the design and planning for operations support will be the responsibility of the AFLCMC.

Under this construct, SPMs and their organizations, which currently report to the ALC commanders, will report to existing PEOs. This realigns the SPMs and 5,262 ALC authorizations associated with program management to the PEO report-

Figure 2.3
Proposed AFLCMC Structure



[a] SAF/AQ provides SAE process oversight.
NOTES: SAF/IE = Assistant Secretary of the Air Force for Installations, Environment, and Logistics. SES = Senior Executive Service. AFLCMC functions are as follows: AQ (acquisition), DP (manpower and personnel), EN (engineering and technical management), FM (financial management), HO (command historian), PK (contracting), JA (staff judge advocate), SB (small business), SE (safety), XP (strategic plans and programs).

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ing chain. The realignment retains the reporting of SPMs currently located at AFMC product centers under the PEO. There are currently 9,216 authorizations at the product centers that remain in the PEO structure. The AFLCMC staff will have 660 authorizations, with an additional 1,112 authorizations performing execution functions for SPMs but not necessarily collocated with them (for example, contracting and financial management).[2] As an example, the AFLCMC staff contracting office (PK) will address policy and procedure issues that support the career field, while the Contracting Execution Directorate will handle more immediate AFLCMC contract sourcing, negotiations, and execution that directly support operations. These directorate personnel may be located at an AFLCMC base where their services are required but will be supervised by AFMC/PK. The AFLCMC is also responsible for the new Air Force Security Assistance and Cooperation Directorate and two air base wings (ABWs), not shown in Figure 2.3).[3]

The new AFLCMC and associated reporting chains will align life-cycle management according to the PSBM, in which all design, product development, and support decisions fall under a single hierarchical framework over the life cycle of a weapon system.[4] The two paths AFMC currently has for life-cycle management (that is, one through a PEO and the other through a DAO, both to the SAE) adhere to the intent of the model; however, under the AFLCMC, the DAO path will be eliminated, and all weapon system life-cycle management will flow from a PEO to the SAE. The emphasis here is on a single weapon system's life-cycle management chain—PSM, SPM, PEO, SAE—and a single focal point for the development of weapon systems to meet future warfighter needs. The SAE will continue to have a significant number of direct reports, with 15 PEOs (ten from AFMC) reporting directly to the SAE, along with five capability directors and four functional directors.

The Air Force Sustainment Center

The other new organization on which we focus attention is the AFSC. Under the new construct, the AFSC will be responsible for the operations support portion of life-cycle management, which includes supervising the three air logistics complexes, a supply chain management wing (SCMW), and a supply chain operations wing (SCOW). In addition, the AFSC will have organize, train, and equip responsibility for all assigned personnel (see Figure 2.4). The intent is for the AFSC to develop a common set of depot and supply chain processes, procedures, and metrics to increase availability, capability,

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2 For comparison, the current ACC, ASC, and ESC staffs total 2,116 authorizations.

3 The proposed Air Force Security Assistance and Cooperation Directorate is currently the Air Force Security Assistance Center (AFSAC).

4 For details about the PSBM, see DoD (2011). The PSBM describes the methodology DoD intends to use to ensure the best product support by balancing weapon system availability with affordable and predictable total ownership cost. The model provides a description of the roles, relationships, accountability, responsibility, and business agreements among the managers, integrators, and providers of product support.

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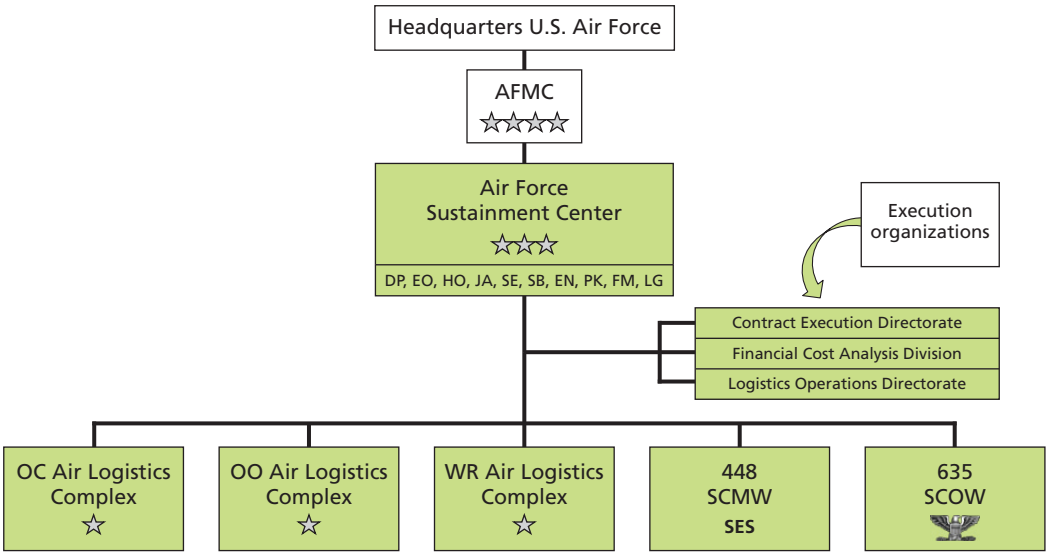
Figure 2.4
Proposed AFSC Structure



NOTE: SCMW = supply chain management wing. SCOW = supply chain operations wing. AFSC functions are as follows: DP (manpower and personnel), EO (equal opportunity), HO (command historian), JA (staff judge advocate), SE (safety), SB (small business), EN (engineering and technical management), PK (contracting), FM (financial management), LG (logistics).

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and affordability and to be the single face to customers for all depot maintenance and Air Force supply chain matters.[5]

In the new structure, the former ALC depot maintenance and AFGLSC supply chain personnel align under the AFSC, moving 26,071 authorizations to the AFSC—21,953 from the ALCs and 4,118 from the AFGLSC. AFSC staff will consist of 402 authorizations, with an additional 689 authorizations to perform execution functions within their field, similar to the way in which the AFLCMC is organized.[6] These execution organizations may be located at an air logistics complex to support their

[5] The establishment of AFSC addresses several of the issues identified in a study by the Committee on Examination of the U.S. Air Force's Aircraft Sustainment Needs in the Future and Its Strategy to Meet Those Needs, part of the National Research Council's Air Force Studies Board. Those issues include a lack of operations support enterprise processes, ill-defined organizational structure for enterprise operations support, and lack of a single senior commander in charge of the entire operations support enterprise. See National Research Council, Committee on Examination of the U.S. Air Force's Aircraft Sustainment Needs in the Future and Its Strategy to Meet Those Needs, *Examination of the U.S. Air Force's Aircraft Sustainment Needs in the Future and Its Strategy to Meet Those Needs*, Washington D.C.: National Academies Press, 2011.

[6] For comparison, the former staffs of the AFGLSC, OC-ALC, OO-ALC, and WR-ALC totaled 2,049 authorizations.

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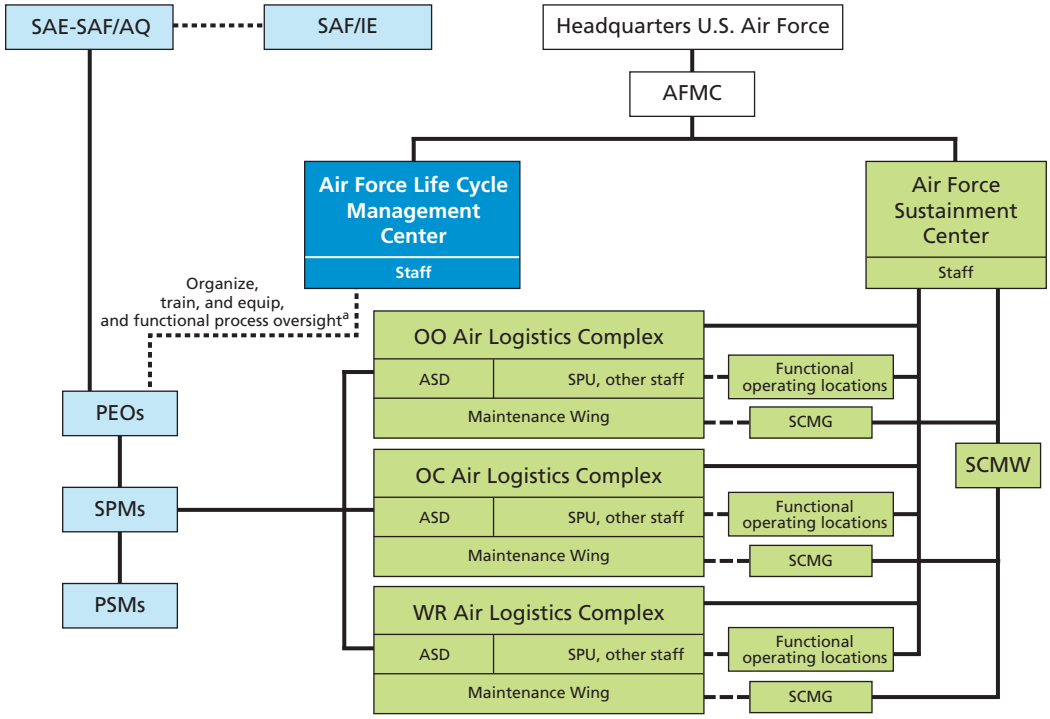
operations and will be overseen by the appropriate staff at the AFSC (for example, the Logistics Operations Directorate will be managed by AFSC/LG).

A new aerospace sustainment directorate (ASD), with approximately ten authorizations, will be established at each air logistics complex. These new ASDs will not have the same mission as the current ASDs; rather, they will help facilitate information exchange regarding operations support requirements between program offices and maintenance wings and supply chain groups at each location (see Figure 2.5).

To aid horizontal integration between product development/support-system design and operations support, the SPM will coordinate with the new ASD for depot operation functions. However, the SPM is aligned under the SAE-PEO construct so the SPM will report to the PEO.[7]

Each air logistics complex will also have a new strategic planning unit (SPU) made up of seven authorizations each (also shown in Figure 2.5). The focus of the SPUs will

Figure 2.5
The Proposed Reorganization Creates Organizations to Maintain Communication Channels



[a] SAF/AQ provides SAE process oversight.
NOTE: SCMG = supply chain management group.
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[7] The reorganization plan originally had SPMs reporting to both the air logistics complex commanders and the PEOs. Dual reporting does not appear to be feasible; however, the air logistics complex commanders should provide some sort of official evaluation of the SPM's performance to the PEO.

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be on aligning AFSC (at the air logistics complexes) and AFLCMC (the SPM) strategy by developing and implementing long-term infrastructure and mission plans. The SPUs will also be responsible for developing and overseeing strategic partnerships with federal, state, and local government entities associated with their respective locations.

Finally, a supply chain management group (SCMG) will also be located at each air logistics complex to provide continuous, worldwide and direct support to air logistics complex operations. The SCMGs will formally report to a SCMW, which will report to the AFSC. The AFSC will also be responsible for three ABWs (not shown).

Summary of Air Force Life-Cycle Management under the Proposed Reorganization

In summary, the proposed reorganization reduces AFMC from 12 centers to five, aligning all product development execution responsibilities under the SAE. The SPMs remain in the PEO/SAE reporting chain, but the SPM's geographic location will continue to move (from the AFLCMC or an AFLCMC operating location to an air logistics complex) as the weapon system matures. The reorganization also aligns all product development/support-system design activities under the SAE with organize, train, and equip responsibilities under the AFLCMC, led by a lieutenant general.

For operations support, a lieutenant general commander of the AFSC will have supervisory responsibilities over all depot maintenance and Air Force supply chain operations, as well as all operations support organize, train, and equip responsibilities. And new organizations are created within each air logistics complex—an ASD and an SPU.

Our next task is to assess how the proposed organizational structure affects the disposition of manpower and functional responsibilities. We address these issues in Chapter Three.

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CHAPTER THREE

Manpower Comparison: Current Baseline to Proposed Restructure

In this chapter, we provide an assessment of the manpower authorizations that have been cut in the new organizational structure and the life-cycle cost savings associated with those cuts.

Data and Background Information

Various documents released by AFMC state the reorganization will eliminate 1,051 manpower positions and save approximately $109 million annually in the product development/support-system design and operations support areas.[1] Two documents provide details about the manpower allocation changes resulting from AFMC's reorganization into a five-center construct. The first is AFMC's February 6, 2012, Organization Change Request (OCR).[2] That document formally addresses several questions related to the reorganization, including why the change is being made, expected benefits of the reorganization, detailed structural changes (including changes in chains of command), how the change complies with existing guidance, and estimates of the costs associated with the change. The OCR also includes estimates of the total number of officer, enlisted, civilian, and contract manpower-equivalent positions that will be assigned to each component in the new organization.[3]

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[1] Air Force Materiel Command, "Update on Air Force Initiatives: AFMC 5-Center Construct and Global Base Support," briefing November 3, 2011. The briefing was presented at a "commander's call" to inform Air Force personnel about the reorganization. This information was also included in a widely disseminated email from AFMC Commander Gen Donald Hoffman, dated November 3, 2011.

[2] Air Force Materiel Command, *Organizational Change Request for Air Force Materiel Command*, OCR 12-01, February 6, 2012.

[3] The February 6, 2012, OCR states that the manpower reduction resulting from the reorganization will include 1,000 O&M-funded positions and 209 test and evaluation–funded positions. Sixty-seven of these positions were already going to be returned to the Air Force, but they had not yet been added to the unit manpower document (UMD). Fifty-seven civilian communications positions were eliminated through consolidations related to an initiative to develop an installations support command. Although the command was not established, the cuts in authorizations were still made. Finally, 34 military positions were cut—four enlisted positions associated with

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The second document is the unit manpower document, which provides details about individual positions authorized in an organization. This information includes, among other things, the position number, the office symbol code (OSC),[4] the personnel accounting system code (an eight-digit code assigned to each Air Force unit), and the grade and Air Force specialty code associated with the position. The UMD also indicates whether positions will be funded in future years. We received a file developed from the February 2011 end-of-month AFMC UMD using FY 2012 totals, which was the baseline for the reorganization.[5] In addition to data on currently authorized positions, the document included information on reductions in authorizations that were originally proposed by AFMC, some information on the location of each position in the new five-center AFMC construct, and revised reductions made after discussions with several key stakeholders.

The remainder of this chapter details our analysis of the disposition of manpower authorizations under the new AFMC structure.[6]

Changes in the Disposition of Major Functions

Using data from the UMD, the following analyses are based on organic (military and civilian) funded FY 2013 authorizations.[7] Contract manpower–equivalent positions are not included in the analysis.

Disposition of Manpower Authorizations, by Functional Grouping

A portion of this research involved examining the disposition of functions under the five-center construct.[8] Specifically, the task was to assess whether AFMC retained all

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the installations support command's communications function, plus 30 additional military cuts. The remaining 1,051 civilian cuts were from the five-center reorganization.

[4] According to Air Force Instruction 38-101, *Manpower and Organization*, March 16, 2011, OSCs identify the organizational structure and functional responsibilities within a unit. For instance, "HO" is the OSC for the history office in the wing headquarters. Air Force Manual 33-326, *Preparing Official Communications*, November 25, 2011, provides guidance on OSCs, which were formerly called *organization structure codes* (Air Force Instruction 38-101, 2011, para. 4.4.).

[5] The file was provided by Headquarters AFMC, Strategic Plans, Programs, and Analysis Directorate (AFMC/A8/9), on February 10, 2012.

[6] AFMC has issued a subsequent OCR for the proposed reorganization, which contains revised manpower data. In addition, there are other ongoing initiatives within AFMC to reduce headquarters staff. This analysis is based on the February 6, 2012, OCR and thus may differ slightly from current manpower data.

[7] The AFMC UMD includes manpower from several budget appropriation groups: operations and maintenance (3400), military personnel (3500), research, development, test, and evaluation (3600), Air Force Reserve (3740), Air National Guard (3840), and working capital fund, known as the Depot Maintenance Activity Group and Supply Management Activity Group (4930). The civilian reductions were taken principally from the O&M and the research, development, test, and evaluation appropriations groups.

[8] As mentioned earlier, the UMD file we received included "original" AFMC reductions and "revised" reductions. About 44 of the original reductions were restored, with new reductions taken elsewhere. In the UMD, the

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its critical functions in the new organization. To this end, we examined manpower positions (before and after the reorganization) according to the functional groupings listed in Table 3.1.

Table 3.2 summarizes the current and proposed distribution of positions in the categories outlined in Table 3.1. The net change in authorizations is 1,051, which is consistent with AFMC's statements. There is a large decrease in the number of authorizations for center staffs, but as we will see later, this is because of the realignment of those positions in the new structure.

Disposition of Manpower Authorizations, by Organization

Next, we present the same information from an organizational viewpoint. Figure 3.1 shows where positions were located in the 12-center construct according to the groupings in Table 3.1. Figure 3.2 shows the same information for the new five-center construct. We use color-coding to represent each functional grouping.[9]

For example, Figure 3.1 shows that WR-ALC has about 12,000 positions that are distributed among air base wings/groups, product development/support-system design, depot-level maintenance, and center-level staff.[10] Similarly, ESC has about 6,000 authorizations in the air base wings/groups, product development/support-system design (that is, in directorates in the PEO-reporting chain), and center-level staff groupings. The color-coding in Figure 3.1 helps one visualize the transition of functions to the new five-center construct, as seen in Figure 3.2.

Figure 3.2 shows how the product development and support design at former product centers (in blue), currently dispersed among ESC, ASC, and AAC (as shown in Figure 3.1), will all be included in the new AFLCMC. Similarly, the product development and support design at former air logistics centers (the green cross-hatch), currently at ASDs located at WR-ALC, OO-ALC, and OC-ALC (as shown in Figure 3.1), will be included in the new AFLCMC. Depot-level maintenance and supply chain operations positions (in green) currently organized under WR-ALC, OO-ALC, OC-ALC, and AFGLSC will all be included in the new AFSC. This organizational "movement" is virtual: Reporting chains will change, but the physical locations of the authorizations will not.

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distribution of positions across the new five-center AFMC organization is based on the "original" reductions; the document does not show where the restored positions will go in the new organization, so the tables and figures in this chapter are based on the original reductions.

[9] Figures 3.1 and 3.2 combine depot-level maintenance and supply chain operation totals that were listed separately in Table 3.1.

[10] Note that contract manpower–equivalent positions are not included in the totals in Figure 3.1 or Table 3.2.

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Table 3.1
Manpower Positions in New Organization

Category	Current Location	Proposed Location
Product development/ support-system design at former product centers	Within directorate organizations at the product centers (AAC, ASC, and ESC) and AFSAC	Within the directorate organizations at AFLCMC Within the Air Force Security Assistance and Cooperation Directorate
Product development/ support-system design at former air logistics centers	Within the ASDs at the air logistics centers (OC-ALC, OO-ALC, and WR-ALC)	Within the directorate organizations at AFLCMC
Depot-level maintenance	Within maintenance wings at the ALCs (OC-ALC, OO-ALC, and WR-ALC)	Within maintenance wings at the new air logistics complexes
Supply chain management and operations	Within supply chain operations wings and groups at the AFGLSC[a]	Within supply chain management and supply chain operations wings and groups under the AFSC
New execution organizations[b]		Contract Execution Directorates (AFLCMC, AFSC, and AFTC) Cost and Financial Analysis Division (AFLCMC and AFSC) Logistics Operations Directorate (AFSC) Program Development and Integration Directorate (AFLCMC) Program Execution Directorate (AFLCMC) Technical Engineering Directorate (AFLCMC)
Center-level staff	Within center-level staff offices at each of the 12 centers except AFNWC and AFRL	Within center-level staff offices at AFLCMC, AFSC, or AFTC in the proposed structure
Base operating support (BOS)	Within ABWs or groups (except the 377 ABW at Kirtland Air Force Base (AFB) and under AFNWC)	Within ABWs or groups (except the 377 ABW at Kirtland AFB and under AFNWC)
Test	Within non-staff organizations at AEDC and all positions within the 46th Test Wing (AAC) or 412th Test Wing	Within AEDC or a test wing[c]
Other (for example, AFNWC, AFRL, Headquarters AFMC, field operating agency [FOAs])	Within AFNWC, AFRL, Headquarters AFMC or in an FOA	Within AFNWC, AFRL, Headquarters AFMC, or in an FOA

[a] The 591st Supply Chain Operations Group, 448th Supply Chain Operations Wing, and 635th Supply Chain Operations Wing.

[b] These organizations currently do not exist and have no perfect analogue in the current structure, but a majority of the positions within these new organizations currently reside in functional center staff offices.

[c] AEDC will be redesignated as a "complex"; precise counts for complex-level staff are not identifiable in the UMD provided to us and are not included in the counts for center-level staff in the post-reorganization construct.

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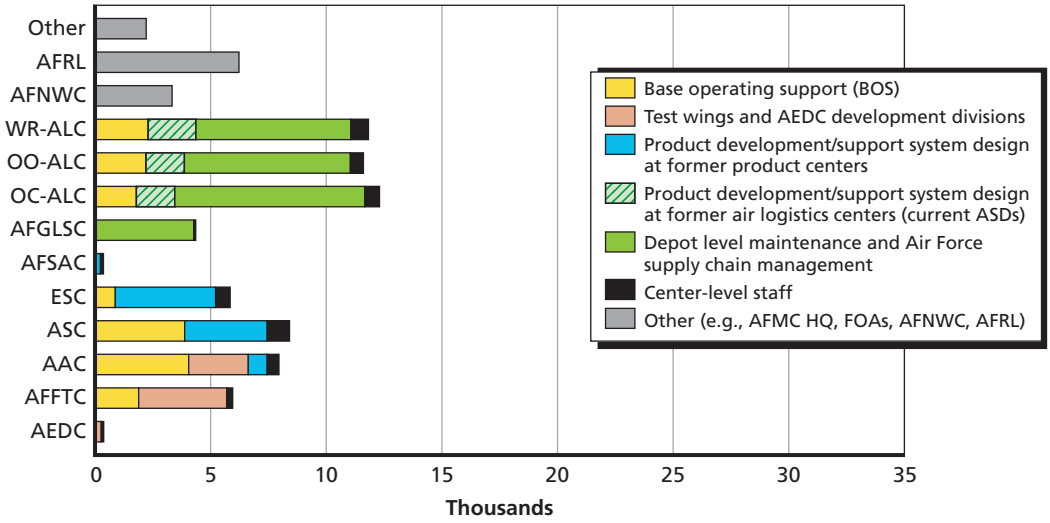
Table 3.2
Disposition of Positions, by Functional Grouping

Functional Grouping	Current Number of Positions	Proposed Number of Positions	Difference	% Change
Product development/support-system design at former product centers	8,922	9,216	294	3.3
Product development/support-system design at former air logistics centers	5,396	5,262	–134	–2.5
Depot-level maintenance	22,074	21,953	–121	–0.5
Supply chain management and operations	4,256	4,118	–138	–3.2
New execution organizations		1,943	1,943	N/A
Center-level staff	4,663	1,162	–3,501	–75.1
Base operating support (BOS)	16,862	17,537	675	4.0
Test	6,642	6,646	4	0.1
Other (for example, AFNWC, AFRL, Headquarters AFMC, FOAs)	11,722	11,649	–73	–0.6
Total	80,537	79,486	–1,051	–1.3

NOTE: Manpower authorizations realigned or eliminated as of February 6, 2012.

Figure 3.1
Current Manpower Authorizations, by Organization



NOTE: The figure shows manpower authorizations as of February 6, 2012.

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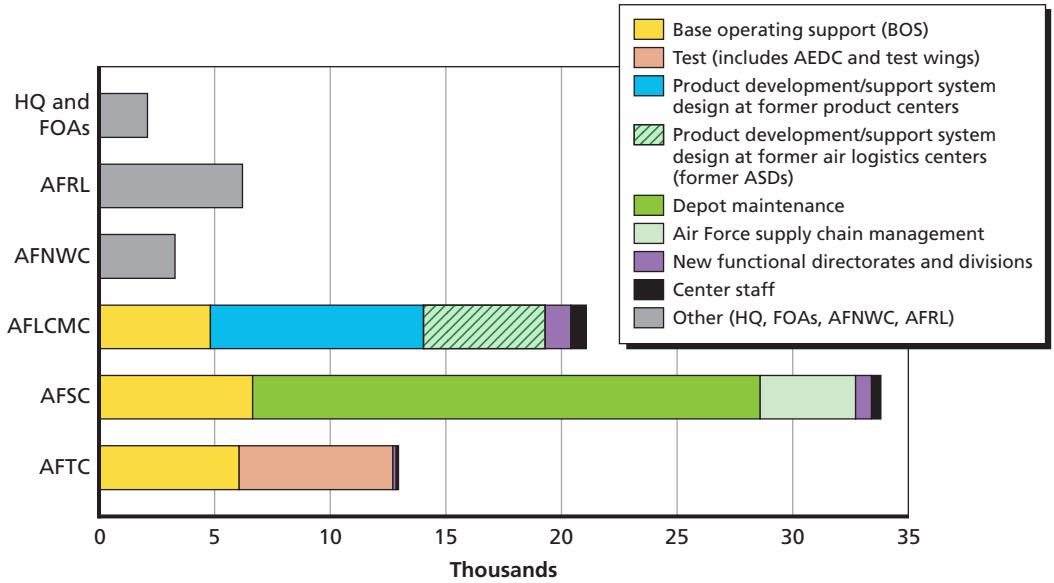
Figure 3.2
Proposed Manpower Authorizations in the New Construct, by Organization



NOTE: The figure shows manpower authorizations realigned or eliminated as of February 6, 2012.
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Authorization Cuts at the Organizational Level of Detail

Table 3.2 and Figures 3.1 and 3.2 showed the effect of the proposed AFMC reorganization on the distribution of manpower authorizations among organizations and functional groupings. The intent was for reductions to come largely from overhead and administrative functions, as opposed to those functions directly involved with producing product develop/support-system design or operations support outputs.[11] Table 3.3 shows the types of positions that were cut as part of the reorganization.[12]

All these cuts are civilian positions; 4 percent (43) are from Headquarters AFMC and FOAs, and 67 percent (701) are from center staffs. Of the 183 cuts of positions currently in the ASDs, 177 are from directorate-level staffs, and only six are from positions at or below the division level. If these positions are considered overhead along with the 744 from the center staffs and Headquarters AFMC, then more than 87 percent of the cuts are to overhead positions.

[11] AFMC (2011, slide 13) states that the reorganization "eliminates 1,051 positions at [the] management level." The OCR (AFMC, 2012, p.ii) says that the reorganization will "significantly reduce center overhead."

[12] The analyses in Tables 3.3 and 3.4 are based on the revised five-center cuts in the UMD file provided by AFMC's Office of the Director of Manpower, Personnel, and Services.

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Table 3.3
Manpower Authorization Cuts

Organization Level	Authorizations Reduced
Headquarters AFMC and FOAs	43
Center staff	701
Product development/support-system design at former air logistics centers (currently in ASD staffs)	183
Product development/support-system design at former product centers (currently in PEO directorates)	4
AEDC non-staff organizations	11
Test wings and joint test program office	99
AFNWC non-staff, non-BOS organizations	9
BOS	1
Total	1,051

NOTE: Manpower authorizations realigned or eliminated as of February 6, 2012.

Manpower Savings Resulting from Authorization Cuts

Each position in the UMD is assigned a military or civilian pay grade. We used standard pay rates for these grades to determine the annual cost savings as a result of eliminating a position. These calculations are shown in Table 3.4.[13]

As shown in Table 3.4, the total annual savings from the AFMC manpower authorization cuts is about $109 million, as AFMC statements have indicated.

[13] Table A26-1 in AFI 65-503, *U.S. Air Force Cost and Planning Factors*, February 4, 1994, shows civilian standard composite pay rates for general schedule (GS-1 through GS-15) and "Y-class" (National Security Personnel System) staff. GG (general schedule, excepted service) pay tables are equivalent to the GS scale. Information about the IA pay scale, used in the Defense Intelligence Civilian Personnel System, is available on that program's website. In Table 3.4 we assume that an IA3 salary is equivalent to that of a GS-11 and use the average of GS-13 and GS-14 salaries to calculate pay grade IA4. Since the Senior Executive Service (SES) level is not given in the UMD, we used the GS-15 pay grade for the SES positions.

For the "grade unspecified" positions, we assumed that pay was the average pay for all other positions. Table E.1 in Appendix E shows the pay table used for these calculations. Table E.2 in Appendix E provides a more detailed breakdown of the positions in each pay grade.

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Table 3.4
Cost Savings from Authorization Cuts

Grade Category	Number of Positions Cut	Pay Savings (FY 2011 $)
General Schedule, Excepted Service (GG)	18	2,037,716
General Schedule (GS-1 through GS-15)	905	93,851,618
Senior Executive Service (SES)	4	795,171
Defense Intelligence Civilian Personnel System (IA)	21	2,731,981
National Security Personnel System (YA, YB, YC, YD)	92	8,789,668
Grade unspecified	11	1,144,488
Total	1,051	109,350,642

Summary of Manpower Disposition Under the Proposed Reorganization

Our analysis of AFMC authorization cuts described in the UMD data and in the OCR is consistent with AFMC statements that cuts will total 1,051 positions and save about $109 million annually. Detailed analysis of the disposition of positions in the new five-center construct showed that important functions will be preserved but realigned in new organizations.[14] Additional analysis beyond UMD and OCR manpower authorization changes is needed to assess the many potential consequences of the proposed AFMC reorganization. These issues are examined later in this monograph.

[14] It remains unclear whether the source of funding for any positions will change—for example, whether positions in the new construct would be paid for through the Working Capital Fund. Although outside the scope of this analysis, this is an area that warrants monitoring in the future.

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CHAPTER FOUR

Life-Cycle Management Alternatives: An Assessment of Two Options

The management of a weapon system through its life cycle depends on many functions and responsibilities. These functions and responsibilities can be grouped into those associated with product development, including support-system design, and those associated with operations support. The functions associated with product development/support-system design include developing, producing, and fielding new systems and modifying existing systems to meet future operational readiness and warfighter needs. These responsibilities include development functions to ensure reliability, maintainability, and sustainability (including engineering design); initial support concept development; and system fielding and weapon system beddown planning, as well as planning for the eventual retirement of the system.

Air Force operations support functions are those associated with depot maintenance and Air Force supply chain operations, such as overhauling systems and subsystems, installing modifications to meet operational requirements over a system's lifetime, and managing Air Force supply chain operations to provide component parts to operational units at operating locations.[1]

The goal of product development/support-system design functions is to develop, produce, and field systems to meet future warfighting needs, focusing on cost, schedule, and performance trade-offs. Operations support functions also focus on meeting current warfighter needs, focusing on cost-effective ways to meet those requirements. Both functions play a role throughout the life cycle of a system, but the emphasis shifts over time (see Figure 4.1).

Figure 4.1 provides a notional example of how the focus of life-cycle management changes over time. The figure illustrates how product development attention changes in the later phases of a weapon system life cycle to concentrate on developing modifications to extend the useful life of the system or to provide additional operational capabilities.

There are different ways to draw the boundaries between product development/support-system design and operations support activities. Organizational change lit-

[1] In our analysis, we did not consider maintenance and supply chain operations at the base level as operations support functions.

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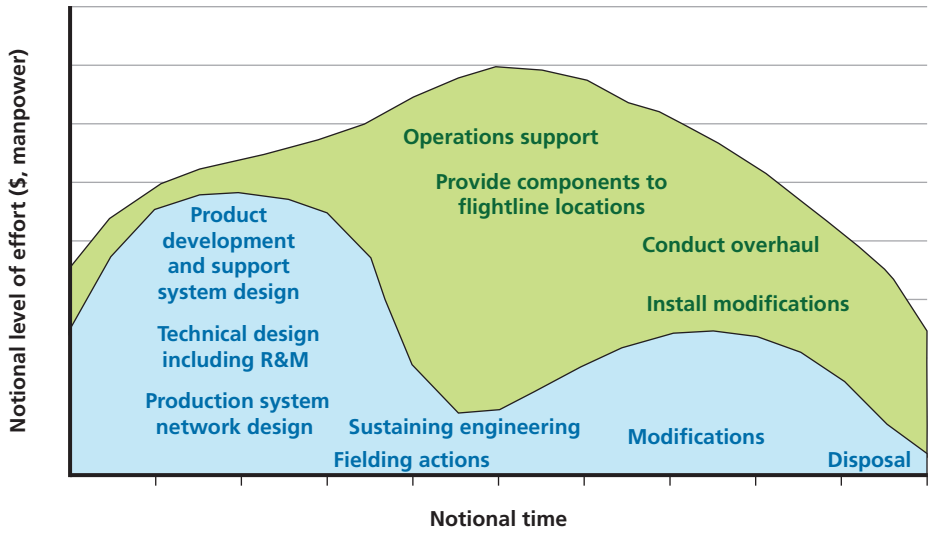
Figure 4.1
How Life-Cycle Management Focus Changes over Time



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erature and best commercial reengineering practices indicate that processes can be arranged differently to accomplish the same organizational goals.[2] The literature points out that each organizational option will have opportunities and challenges associated with achieving organizational goals. This is the case with weapon system life-cycle management. There is not "one best way" to organize life-cycle management functions. Each organizational structure has opportunities and challenges.

The Current Organizational Construct

The current approach to life-cycle management divides product development/support-system design functions between two separate organizations, with some product development/support-system design functions being conducted by the product centers' program managers and PEOs at AAC, ASC, and ESC and some by the air logistics centers' SPMs and DAOs at OC-ALC, OO-ALC, and WR-ALC. Under the current construct, program management responsibilities for mature systems transfer to an SPM who is located at an air logistics center and rated by the air logistics center commander (shown by the green hachured area in Figure 4.2). However, a portion of system program management for mature systems—activity associated with major modifications—is managed by a program manager who reports to a PEO, usually at

[2] See the "Academic Literature" section of Appendix C for a list of the academic references used in this analysis.

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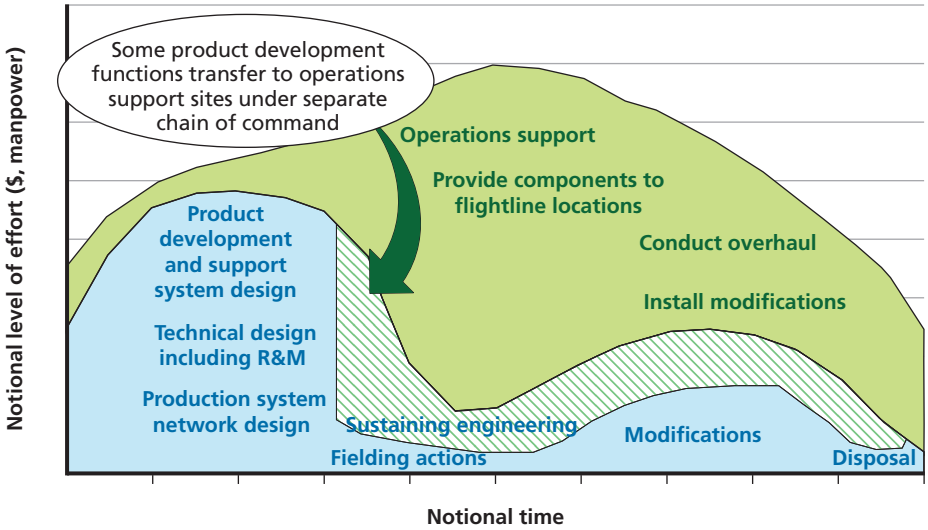
Figure 4.2
Division of Product Development Functions Between Organizations in the Current Life-Cycle Management Construct



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a product center (shown in blue). Under the current construct, operations support is conducted by the three air logistics centers and the AFGLSC (shown in green).

There are several advantages to the way in which life-cycle management functions are separated in the current organizational structure. Under the current construct, the SPM reports to a PEO when the focus of activities is on initial system development, managing system procurement, manufacturing, testing, and delivery. When the system matures and the focus is on day-to-day operational requirements and maintaining the system until retirement, the SPM is transferred to an air logistics center and reports to the air logistics center commander. This arrangement allows program managers in the product centers to focus on new system development and fielding. They receive training and gain experience in these areas. Similarly, it also allows program managers for mature systems to hone their skills in day-to-day operational requirements and in providing support over a system's lifetime.

Horizontal integration involving collaboration among depot maintenance, supply chain, and SPM personnel is central to successful long-term weapon system support. For example, integrated support plans developed through informal coordination among maintenance, supply chain, and SPM personnel can facilitate the development of strategic plans that involve trade-offs in developing the content of work packages for system overhauls and the cost of conducting the overhauls. This horizontal integration facilitates dialogue about how alternative work packages affect the cost and supportability of alternative work packages. It is also useful in modifying operational-level (yearly) and tactical-level (day-to-day) adjustments to the strategic plan. In addition,

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horizontal integration is fundamental to supporting weapon systems efficiently and effectively. In the current organizational construct, SPMs for mature systems are in the same chain of command as depot maintenance personnel supporting horizontal integration.

However, the current organizational structure also presents some challenges. First, because PEOs and SPMs for mature system have different reporting chains, experience gained in operations support is not necessarily transferred to PEOs. In addition, PEOs are not responsible for supporting weapon systems when they mature. As a result, when assessing trade-offs among cost, schedule, and performance, PEOs may not pay enough attention to issues that affect long-term support costs. The practice of transferring SPMs to another reporting chain at a specified point in the weapon system's life cycle also requires the development of program transfer criteria to ensure that important program management responsibilities are specified and continue without disruption when systems transfer from the PEO to the air logistics center commander.

When modifications to a mature system are required, the SPM can undertake the modification if the cost is below a specified threshold. If the modification is complicated or the expected cost of the modifications exceeds the threshold, the modification is managed by a program manager at a product center who reports to a PEO. Thus, the current organizational construct splits program management responsibilities among multiple program managers and product development/support-system design officials. Problematic situations can arise where there are multiple managers involved in product development/support-system design activities.

The current construct also requires manpower to support program management functions at both the air logistics centers and the product centers. Program managers' support staffs at the air logistics centers are in the ASDs. The current construct also requires the appointment of DAOs at the air logistics centers to support program management modification contracts.

The current construct partitions program management manpower into two "silos": one to develop new systems and one to support mature systems. These stovepipes, or silos, do not support moving program management manpower from early product development/support-system design to operations support or vice versa. They can also prevent opportunities for product development/support-system design personnel to gain experience in supporting day-to-day operations.

In addition, supply chain personnel under the current organizational construct do not report to the air logistics center commander. Rather, they report to the AFGLSC, which can complicate horizontal integration.[3] Yet, at one air logistics center, because of the leadership focus, supply chain personnel who report to the AFGLSC commander have been collocated with SPM and maintenance personnel to ensure that horizon-

[3] National Research Council, 2011.

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tal integration occurs.[4] Headquarters AFMC recognizes the importance of horizontal integration and has addressed its importance, at least in part, in its *Logistics Requirements Determination Process* handbook.[5]

Finally, the current organizational structure employs a technology repair center (TRC) concept to take advantage of economies of scale. This presents additional challenges. Under the TRC construct, air logistics centers have developed specialized capabilities for enterprise-wide repair. For example, OO-ALC provides landing gear repair capabilities for all weapon systems. OC-ALC provides engine support, and WR-ALC provides avionic repair capabilities. Supply chain personnel who support these repair capabilities are generally located at the air logistics center that provides this enterprise-wide capability. Thus, no current air logistics center commander has control over all the resources necessary to support major weapon system overhaul or modification workloads. Thus, formal information systems support the transfer of requirements, scheduling of workloads, inventory planning and execution, and other data provision. In addition to these formal systems, informal communication channels are often used to support horizontal integration across air logistics centers for major overhaul and modification programs.

The Air Force has proposed a structure for the future with its own set of opportunities and challenges. Next, we assess the impacts of the proposed reorganization on effective warfighter support and efficiency of operations.

The Proposed Organizational Construct

The proposed reorganization draws the organizational boundaries differently. The proposed reorganization keeps product development/support-system design under the PEO and SPM reporting chain, supported by the AFLCMC. Operations support—that is, depot maintenance and Air Force supply chain operations—is under the AFSC (see Figure 4.3).

When a program matures, system program offices will transfer program responsibility as is the case now; however, SPMs will continue reporting to the PEO. Figure 4.4 shows these new system boundaries between product development/support-system design and operations support.

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4 Warner Robins Air Logistics Center, *Concept of Operations for Enterprise-wide Implementation of Maintenance Requirements Supportability Process (MRSP) to C-5, F-15, and C-130 Product Lines*, March 9, 2012.

5 See Air Force Materiel Command, Centralized Asset Management, *Logistics Requirements Determination Process Handbook*, Version 7.0, Wright-Patterson, AFB, December 2011.

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Figure 4.3
Proposed Boundaries Between Product Development/Support-System Design and Operations Support under the New Construct

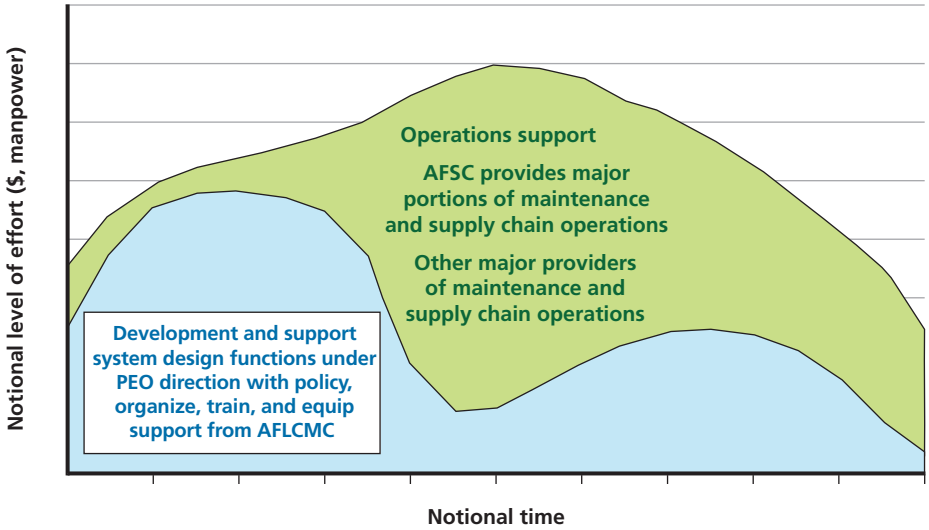

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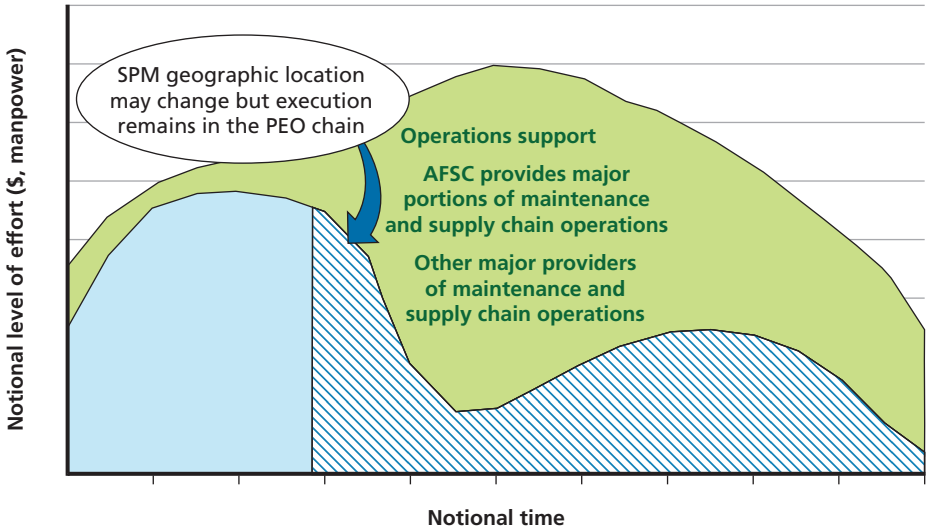
Figure 4.4
The System Program Office Transfers Some Program Responsibility but the Execution Chain Remains the Same in the New Five-Center Construct



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Implications of the Proposed Reorganization for Support to the Warfighter and Life-Cycle Management

A common theme found in organizational theory and best business practice is the notion that well-understood goals are critical to designing and focusing organizations. Once goals are identified, processes can be engineered to support them, and then an organization can be designed to focus processes on goal achievement.[6] We begin the analysis of the proposed reorganization by articulating AFMC's goals—in terms of both product development/support-system design and operations support. We then summarize the opportunities and challenges created by the proposed reorganization in achieving these goals.[7] We discuss the strategies that AFMC has developed to leverage opportunities and mitigate challenges. Finally, we discuss how the proposed reorganization may affect support to warfighters and life-cycle management effectiveness and efficiency.

Operational-Level Goals

Through discussions with key Air Force personnel, examining past analyses of product development/support-system design and operations support, and evaluating ongoing Air Force initiatives and related PAF research, we documented what we understood the Air Force's operational-level goals to be.[8] The goals express the key operational-level capabilities needed to achieve efficient and effective product development/support-system design and operations support. Product development/support-system design goals include the ability to accomplish the following:

- Improve processes to rapidly deliver capable, cost-effective, and supportable systems for the warfighter.
  - Standardize core "best-practice" product development/support-system design processes and tailor them based on specific weapon system requirements.
  - Eliminate nonproductive processes and bureaucracy.
  - Emphasize capability-cost trade-offs in the requirements process.
- Improve processes to reduce weapon system life-cycle costs.
  - Introduce enterprise support-system design planning early in development.[9]
  - Apply support-system design criteria consistently across programs.

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6 See the "Academic Literature" section of Appendix C for a list of the academic references used in this analysis.

7 We use the Air Force's DOTMLPF (doctrine, organization, training, materiel, leadership and education, personnel, and facilities) framework to help identify opportunities and challenges associated with the proposed reorganization.

8 These are RAND-derived goals, agreed upon with the Air Force. These goals were not used in this form by AFMC in its analysis of the proposed organizational structure.

9 By this, we mean the plan for how the system will be supported throughout its life cycle as part of the product development process.

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- Improve overall day-to-day support to program managers, PEOs, and operations support managers.[10]
- Allocate scarce resources (manpower and funding) to the highest-priority programs.[11]
- Develop and maintain the product development/support-system design workforce.

Likewise, we identified the following operations support goals:

- Establish a logistics network that is right-sized to meet dynamic mission generation unit needs focusing on depot maintenance and supply chain operations.[12]
  - Standardize and simplify best-practice processes.
  - Eliminate nonproductive processes and bureaucracy.
  - Emphasize capability and cost trade-offs in the requirements process.
- Establish a logistics command and control (C2) capability to proactively orchestrate enterprise actions to meet operational needs in the execution time horizon.
- Improve operations support productivity.
  - Institute maintenance process improvements (for example, high velocity maintenance).
  - Leverage technology (for example, electronic technical information management system).
- Allocate scarce resources (manpower and funding) to the highest-priority programs.[13]
- Develop and maintain the operations support workforce.[14]

We shared both sets of goals with Air Force senior leaders and received verification that we captured the essence of the Air Force's intent.

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[10] By this, we mean provide people with the tools, information, training, and policy guidance they need to perform their duties effectively and efficiently.

[11] Headquarters Air Force distributes funding in accordance with the authorization and appropriation language and the Office of Management and Budget guidance. SAF/FM provides budget authorization, while SAF/AQ provides program authorization. AFMC, through its organize, train, and equip responsibilities, allocates manpower.

[12] Mission generation units launch and recover aircraft and are capable of launch-and-recovery and remove-and-replace maintenance only. Improving (standardizing best practices or simplifying) depot maintenance and supply chain operations may change the composition of that network.

[13] Headquarters Air Force provides sustainment funding to a central pool, and AFMC, as the Air Force enterprise executive agent, prioritizes and allocates resources through the Centralized Asset Management process with input from MAJCOMs and others.

[14] Elements of the operations support goals were vetted by the Office of the Deputy Chief of Staff for Logistics, Installations, and Mission Support, Headquarters Air Force (AF/A4/7), the Air Staff A4 directorates, the Vice Commander of AFMC, the air logistics center commanders, and MAJCOM A4s and accepted during a Logistics Enterprise briefing on March 11, 2009, and documented in a forthcoming RAND report.

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Opportunities and Challenges Created by the Proposed Reorganization

Like the current organizational construct, the proposed reorganization brings several opportunities and challenges. Through our analysis and discussions with current commanders, stakeholders, Senate and House staff, and others, we identified some specific areas that warrant mention. The proposed reorganization has the potential to address the long-standing issue of including support-system design considerations early in product development if policy, processes, and incentives are put in place to motivate integrated and balanced decisionmaking. Consolidating product development organize, train, and equip functions in the AFLCMC under the leadership of a three-star commander also provides an opportunity to standardize core best-practice product development/support-system design processes (along with the ability to select applicable processes, as appropriate), potentially reducing the time it takes to develop products. Finally, with the product development/support-system design workforce being managed by the AFLCMC, there is an opportunity to move manpower between systems and among sites as personnel requirements change. For example, if SPMs are on a single UMD, as systems mature and SPM functions shift to the air logistics complexes, personnel can move from the AFLCMC to the air logistics complexes and then back again as needed.

Similarly, in the AFSC, all operations support functions, including organize, train, and equip and policy development, will be consolidated under a three-star AFSC commander, who will supervise depot maintenance and Air Force supply chain operations. Combining the management of depot functions under a single commander provides the opportunity to standardize best practices across the air logistics complexes, potentially generating operations support efficiencies. A single operations support commander could institute processes to further enhance C2 of Air Force supply chain operations to better meet warfighter needs.

Finally, consolidating product development/support-system design and operations support—each in a new center—has the potential to create staffing efficiencies by eliminating duplicate activities and functions. What were separate staffs at different centers will now be consolidated, with fewer staff performing the same functions.

On the other hand, the proposed reorganization does create some challenges in achieving the goals outlined here—some of which have been issues for years under many different organizational constructs.[15] In this proposed construct aligning the product development/support-system design functions performed by the SPM in the SAE-PEO chain of command, and aligning maintenance and supply chain operations in the air logistics complexes under the AFSC chain of command, creates challenges in terms of horizontal integration and collaboration among SPMs, depot main-

[15] See Appendix B for a history of Air Force life-cycle management. Several of the issues faced today have plagued product development/support-system design and operations support for many years.

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tenance, and supply chain operations.[16] Horizontal integration is needed within and among air logistics complexes to channel all the resources necessary to support major weapon system overhauls and modifications. Spread across reporting chains, integration among organizations will depend on clearly defined processes and communication channels. As in the current organizational construct, the effectiveness and efficiency of operations support activities in the proposed construct will depend on the use of formal and informal communication channels within and between air logistics complexes. AFLCMC and AFSC leadership will need to focus on the effectiveness of horizontal integration efforts.

Another potential area of concern is workforce development—how to grow leaders with the right set of skills. The changes in the organizational structure may make it difficult to grow product development/support-system design and operations support leaders with the appropriate mix of product development and operations support skill sets. Concerns in this area focus on PEO and SPM operations support education and experience: They may lack a detailed understanding of weapon system operations support functions.

According to AFMC, within the past several years, PEOs were right-sized to their current workload. The proposed reorganization may expand the workload for some PEOs. Recall that under the current construct, product development functions are split between PEOs and DAOs. In the new construct, all product development functions will be consolidated under the PEOs. Additionally, adding legacy SPM programs dealing with depot maintenance and technical issues related to supply chain operations support, day to day and in the future until system retirement, will further increase the workload for PEOs.

As is the case under the current construct, in the proposed reorganization PEOs, will be challenged to make trade-offs among cost, schedule, and performance that incorporate long-term support costs. Attention and incentives should focus on these trade-offs.

Finally, the proposed reorganization may create gaps in education, training, and development. For example, as discussed earlier, PEOs will now supervise program management functions associated with operations support functions. This includes responsibility for ensuring that legacy program offices continue to support depot and field technical needs for repair and modifications. Program offices will write the technical orders that govern platform-specific repairs, modifications, spares procurement, stockage, and installation. They will further determine the frequency of inspections and where the work will be done (for example, in the field, by contract repair teams, by depot repair teams, in depots, at original equipment manufacturers [OEMs], or

[16] As mentioned earlier, effective horizontal integration is also a challenge under the current organizational construct.

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at third-party providers). There is a question of whether PEOs will have the required training and experience to carry out these tasks.

Air Force Materiel Command Mitigation Strategies

AFMC senior leaders recognize that the proposed reorganization comes with opportunities and challenges. Thus, they have developed mitigation strategies to address several of the challenges.

Effective horizontal communication among program managers, depot maintenance staffs, and supply personnel has been identified as an important part of the reorganization construct. There have been efforts to codify the interactions that support horizontal integration activities. Furthermore, as mentioned previously, new ASDs will be established at each air logistics complex to help maintain horizontal integration among program management, depot maintenance, and supply chain functions. In addition, SPMs are expected to relocate to air logistics complexes during the life cycle of a program and as specified in Air Force instructions.[17]

A network of complex formal and informal communication processes will be necessary under the reorganization. Formal coordination and information flow between centers will not change, and informal communication channels, to the extent possible, are being mapped to try to ensure that they remain intact to allow issues that involve multiple organizations from separate command chains to be handled at the appropriate level.

Other concerns, including workforce development and PEO workload, training, and experience still need to be addressed. AFMC has also addressed the need for a career path that includes the appropriate education and experience for operations support personnel, but similar analyses are needed for product development/support-system design personnel.[18] PEOs and SPMs may not have adequate operations support education and experience; these groups may lack a detailed understanding of weapon system operations support functions. And the workload for the PEO may need to be reexamined, with consideration given to delegating some program execution activities to SPMs.

Finally, the reorganization will create some operational turbulence, which is expected from any major change. As the new organization stabilizes and takes form, it will be necessary to allow some time to better understand where gains are being made and improvements are needed. Senior leader focus and attention is also required to sustain the change.

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[17] The moving of PEOs and/or SPMs is documented in Michael B. Donley, Secretary of the Air Force, letter with attached memorandum to Senators Orrin G. Hatch, Saxby Chambliss, James M. Inhofe, Michael S. Lee, Johnny Isakson, and Tom Coburn and Representatives Rob Bishop, Tom Cole, and Austin Scott, December 9, 2011.

[18] Lt Gen Janet C. Wolfenbarger, Office of the Secretary of the Air Force for Acquisition, letter to Senator Saxby Chambliss, March 16, 2012.

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A command governance process, led by the AFMC Vice Commander, was established to oversee the reorganization implementation and to address these and other issues. AFMC senior leaders associated with leading the planning for the AFLCMC and AFSC formed process planning teams to map current processes to new processes. They (and the centers) hold a weekly executive management review with the AFMC vice commander to discuss these plans. Approximately 150 processes were identified as common between the two centers, with mutual definitions, mappings, and adaptations. These are all appropriate actions and will aid in the implementation of the proposed reorganization. Because of the complexity of the reorganization, AFMC should consider keeping its governance process in place for some time after the move to the new organization to help address unexpected problems as they occur.

Assessment of the Reorganization's Effect on Warfighter Support and Life-Cycle Management Effectiveness and Efficiency

The proposed reorganization does provide opportunities to improve weapon system life-cycle management across product development/support-system design and operations support functions; however, it also introduces some challenges. The boundary, although shifted, remains between product development/support-system design and operations support functions. AFMC has worked to develop mitigation strategies for several of these challenges, but others still need to be addressed. Policies and procedures are needed to ensure that short-term development needs are not given priority over longer-term support requirements. Incentives to motivate AFLCMC to make investments that reduce AFSC support costs should be developed and monitored. At this point, the implications of the reorganization in terms of warfighter support and process efficiencies are unknown and will depend on how the proposed reorganization is implemented over time. In addition, many factors outside the reorganization will affect product development/support-system design and operations support effectiveness and efficiencies—for example, leadership focus, resource constraints, and other ongoing process improvements.

To help gauge these implications, metrics should be developed and tracked to measure whether AFMC is achieving its objectives.[19] Applicable existing metrics should be used and new metrics should be developed to measure program office, depot maintenance, and supply chain activities, including the horizontal integration among them. They should also include a series of leading indicators to identify immediate problems, as well as lagging indicators to establish trends to be compared with historical metrics. For example, productivity metrics, aircraft availability rates, and supply chain metrics should all be measured. In addition, program execution, logistics health assessments,

[19] Similarly, the study by the National Research Council's Committee on Examination of the U.S. Air Force's Aircraft Sustainment Needs in the Future and Its Strategy to Meet Those Needs identified the need for clearly defined goals and the development and implementation of metrics to assess them. See National Research Council 2011.

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and materiel availability in meeting OSD mandatory requirements for major defense acquisition programs should be considered.[20] Processes that depend on communication and integration between the AFLCMC and the AFSC and between these new organizations and the operating commands should be assessed to determine whether the reorganization has improved the effectiveness and efficiency of product development/support-system design and operations support performance. Aircraft availability will be affected by both AFLCMC and AFSC and should be a good indicator of how well these functions are working together. Workforce development metrics should also be tracked. Finally, processes that depend on integration between the SPMs and maintenance wings should be monitored closely. If performance changes in any of these areas, AFMC should determine the root cause and make adjustments as necessary.

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[20] More on high velocity acquisition metrics can be found in "In Step with Lt Gen Tom Owen: Making Things Better," *Exceptional Release Magazine*, Winter 2011.

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CHAPTER FIVE

Options for Improving Air Force Life-Cycle Management

The National Defense Authorization Act for FY 2012 specifically asked for "an examination of how the Air Force should be organized to best conduct life cycle management and weapon system sustainment."[1] As discussed in Chapter Four, a common theme in organizational theory and best business practice literature is the notion that well-understood goals are central to designing and focusing organizations. The business reengineering literature also discusses how process reengineering can lead to organizational constructs that are likely to achieve well-understood goals.

In this chapter, we use these insights to develop options to improve support to the warfighter and life-cycle management effectiveness and efficiency. We begin with the product development/support-system design and operations support organizational goals identified in Chapter Four. Based on our past experience and the input of subject-matter experts, we identify the process or processes that address the goal, opportunity, or challenge. We then present the appropriate theory to address how the process might be reengineered to achieve the goal, mitigate the challenge, or leverage the opportunity and give an example of the process change. Finally, we show how the proposed AFMC organizational structure could be modified to support the process enhancement. The options include the following:

- Option 1: Improve enterprise support-system design planning.
- Option 2: Enforce enterprise support-system design planning guidance early in the product development process.
- Option 3: Standardize best-practice product development and operations support core processes.
- Option 4: Improve C2 support to the warfighter.

Referring back to the opportunities and challenges identified in Chapter Four, Options 1 and 2 can address the long-standing issue of including support-system design considerations early in product development. Option 2 specifically addresses

[1] U.S. House of Representatives, *National Defense Authorization Act for Fiscal Year 2012 Conference Report*, Washington, D.C.: U.S. Government Printing Office, December 12, 2011, Section 326, p. 153.

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the inclusion of support-system design considerations early in product development if policy, processes, and incentives are put in place to motivate integrated and balanced decisionmaking. Option 3 can leverage two opportunities: Standardizing core best-practice product development/support-system design processes, potentially reducing the time it takes to develop products, and standardizing best-practice functions across the air logistics complexes, potentially leading to operations support efficiencies. Finally, Option 4 builds on the advantage of a single operations support commander who can institute processes to further enhance C2 of Air Force supply chain operations to better meet warfighter needs.

Each option presents a process improvement that can be incorporated within the proposed AFMC organizational structure. Each option is separable, they are presented in no particular order, and they are not mutually exclusive. The remainder of this chapter discusses each option in detail.

Option 1: Improve Enterprise Support-System Design Planning

With this option, we propose reengineering product development processes to better integrate operations support considerations early in the development of the system. That is, we suggest incorporating decisions about how the system will be supported over its lifetime during the product development process. Standard criteria should be developed and applied to all new systems. By making informed support-system design decisions—identifying efficient and effective sourcing options for meeting weapon system support requirements early in the product development timeline—overall life-cycle costs could be reduced.

This option addresses AFMC's second product development/support-system design goal:

- Improve processes to reduce weapon system life-cycle costs.
  - Introduce enterprise support-system design planning early in development.
  - Apply support-system design criteria consistently across programs.

Option 1 is based on transaction cost analysis (TCA) theory and the rate of technology change.[2] TCA suggests that successful firms make sourcing decisions based on

[2] Ronald H. Coase, "The Institutional Structure of Production," lecture, in Oliver E. Williamson and Sidney G. Winter, eds., *The Nature of the Firm: Origins, Evolution, and Development*, New York: Oxford University Press, 1993; Ronald H. Coase, "The Nature of the Firm," George J. Stigler and Kenneth E. Boulding, eds., *Readings in Price Theory*, Homewood, Ill.: Irwin, 1952, pp. 386–405; Charles H. Fine, *Clockspeed: Winning Industry Control in the Age of Temporary Advantage*, Reading, Mass.: Perseus Books, 1998.

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two costs: direct costs and governance costs.[3] Applying TCA allows the user to compare transaction costs to meet requirements across a spectrum of contract and in-house sourcing options. In addition, rates of technological change also influence sourcing decisions.[4]

The Air Force operates in an economically constrained environment, and all sourcing options—organic and private-sector capabilities—should be considered to facilitate consistent force readiness and improved cost-effectiveness across the enterprise. Recently, the Air Staff and the Office of the Secretary of the Air Force have made a concerted effort to make sourcing decisions from an enterprise perspective rather than having support evolve from independent weapon system support decisions.[5] To help support this initiative, a separate RAND project developed a framework based on transaction cost and the rate of technology change, providing guidance for initial support-system design decisions. The goal was to ensure that system-specific decisions support Air Force requirements and that those decisions can be made earlier in a program's life, before the formal Defense Transmittal Memorandum business case analysis, to improve the agility, efficiency, and effectiveness of Air Force operations support.[6] Figure 5.1 illustrates how the TCA method can be applied to initial product development sourcing decisions to help shape the operations support enterprise.

Figure 5.1 shows four potential sourcing options: OEM, organic, outsourced to spot market, and outsourced to a long-term, fixed-price contract.[7] The specificity of the product or service and its frequency of use can be used to determine which sourcing option will provide the most cost-effective support. *Specificity* refers to whether the product or service and the technology are commercially available or military-specific. *Frequency* refers to the volume and the consistency of use, or how often tasks are performed. The economic principles associated with transaction cost analysis provide initial insights into where the Air Force can expect to leverage competitive advantages. For example, lower specificity means that an item is more common and may be available in the open market. High specificity means that the item is unique to the military, so there may be only a few providers. In that case, the Air Force could expect organic or OEM sourcing to be the most cost-effective.

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[3] Direct costs are the "costs you see," such as the price paid for raw materials and labor. Governance costs are driven by how a set of activities is performed and include, for example, research, bid development, quality assurance, and other costs that an organization would incur when sourcing a service. See Coase, 1952, 1993.

[4] If technology is progressing at a rate that would be difficult for a firm to match, it may be more cost-effective to rely on the open market to meet those technology needs. If the technology is stable, it may be less expensive to insource, depending on other governance costs. See Fine, 1998.

[5] Office of the Assistant Secretary of the Air Force for Installations, Environment, and Logistics, "Enterprise Product Support Strategy Update Brief," briefing, January 11, 2012.

[6] The RAND-developed framework for enterprise posture is included in a forthcoming draft report by John G. Drew et al., *Enterprise Posture Planning: Strategic Insights to Shape the Future of Weapon System Support*.

[7] Because of the nature of the tasks, inherently governmental tasks will remain within Air Force control.

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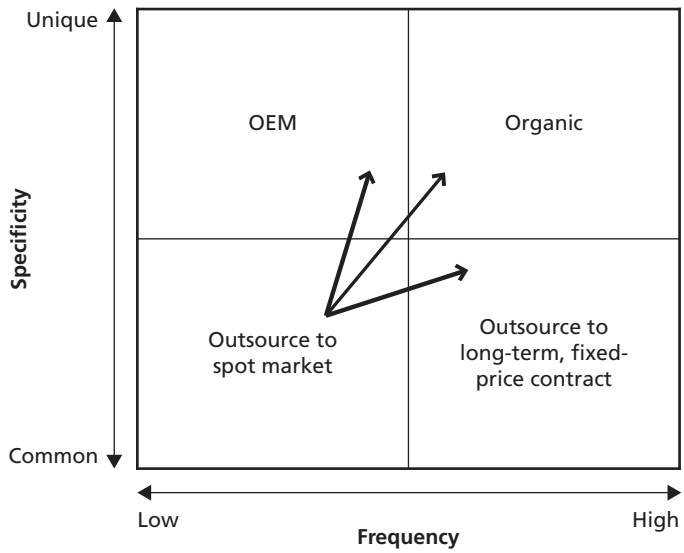
Figure 5.1
Activity Characteristics Provide Insights into Appropriate Organic/Outsource Alternatives



RAND *MG1219-5.1*

Risk and *uncertainty* should also be considered in the decision process. Engineering specifications and interface requirements need to be identified. For a subsystem to be integrated seamlessly, these issues need to be thought through in advance. The cost and risk of using any of these options are based on the likelihood and consequences of failure. For example, outsourcing to the commercial market could present a risk as weapon systems age; similar commercial systems and manufacturing sources may no longer exist. Furthermore, there is a need to maintain capacity to keep up with wartime surges. Increasing levels of frequency, specificity, risk, and uncertainty favor organic operation to minimize total costs.

The rate of technological change for a system or subsystem plays a role in sourcing decisions as well. For instance, if a system capability is expected to change very quickly, as in some computer applications or sensors, the rate of technological change may not make it desirable to support the system with organic resources. On the other hand, if the technology is slow to change, the system may be a good candidate for organic support.

From our view, the KC-46A support-system design strategy is an example of how criteria considering TCA and the rate of technological change can be applied to potential sourcing decisions early in a weapon system's life cycle. The KC-46A team examined how that aircraft could be supported by the Air Force, commercial facilities, and contract enterprises. Then, the team developed a plan to leverage OEMs and other market sources for commercially available parts while using a different approach for

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military-specific parts according to the specificity and frequency of use, as suggested in Figure 5.1.

Since the KC-46A is a commercial derivative of the Boeing 767, the airframe, major components, and parts that are commercially available will be purchased through OEMs or other market sources on an as-needed basis. Instead of being returned to the supplier, the part that is being replaced will be put into the organic supply chain and repaired organically. Therefore, the organic supply chain will have an available stock of high-demand parts. Once the OEMs and other outsourced markets begin to reduce or eliminate the supply of these parts (that is, when the asset specificity increases) and the reliability decreases (that is, the parts' replacement frequency increases), the organic supply chain will have the parts already available. Based on their specificity and frequency of use, the military-unique spare parts will be purchased and controlled organically.

The KC-46A team also built in options to leverage the most appropriate organization for maintenance (that is, organic, contract, or partnership). Weapon system maintenance is a high-frequency, day-to-day function, making organic or long-term outsourcing an option. However, because the specificity of the skills required will increase over time and it is a stable technology, organic maintenance fits the TCA model. In this case, short-term maintenance will be interim contractor support, which will then transition to organic maintenance for the long term.

Data rights (for example, operations, maintenance, and training data) were also required as part of the KC-46A contract. The goal was to ensure that the Air Force could maintain and sustain the weapon system without contractor support. Going back to the characteristics in Figure 5.1, the KC-46A data can be considered a high-frequency need (used in day-to-day operations), and, as the weapon system ages, the specificity of the material increases. These characteristics make organic control the best fit within the TCA framework. These same criteria can be used to make data rights decisions for other weapon systems.

This is just one example of how the TCA criteria can be applied to initial operations support decisions for one weapon system. The application of these types of enterprise product support criteria can be expected to yield different solutions for different weapon systems. The outcomes will depend on the weapon system and its subsystem characteristics.

The proposed reorganization provides an opportunity to inject a support-system design decisionmaking framework into product development processes. Existing processes could be reengineered to incorporate appropriate support-system design strategic planning principles that could, in turn, improve enterprise posture planning across all programs.

To support these processes organizationally, a logistics staff could be created at the AFLCMC level to be the focal point for enterprise support-system design planning (see Figure 5.2). A portion of AFMC's Depot Maintenance Operations Division

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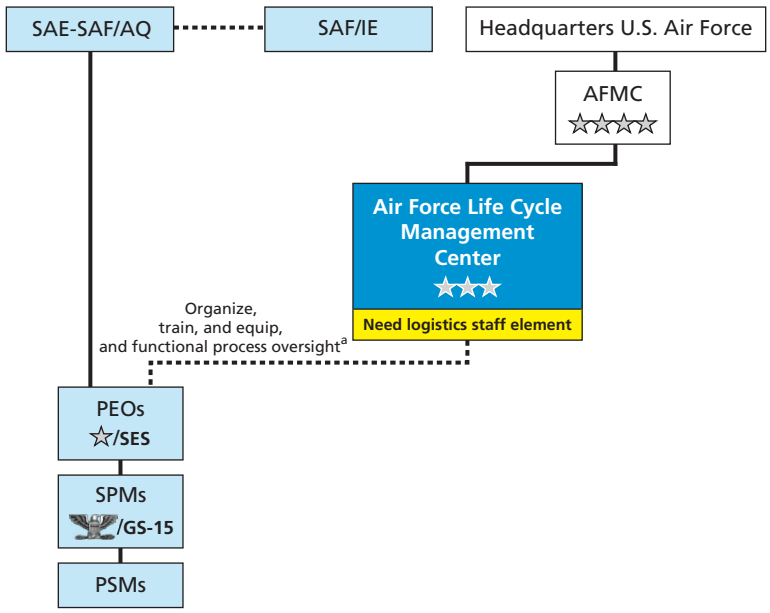
Figure 5.2
Model for an AFLCMC Logistics Staff to Focus on Enterprise Support-System Design Planning Processes



[a] SAF/AQ provides SAE process oversight.
NOTE: The change to the proposed reorganization is shown in yellow.
RAND *MG1219-5.2*

(AFMC/A4D) could be transferred to this logistics function in the AFLCMC. It currently has some capability to identify support-system design strategies at the depot level (for example, CORE, 50/50, TRC) and could expand its assessment to include a strategic enterprise view. This logistics staff could develop policies to ensure that appropriate enterprise support-system design planning is introduced early in the development phase and consistently across programs.

Option 2: Enforce Enterprise Support-System Design Planning Guidance Early in the Product Development Process

With this option, we propose creating an acquisition and logistics (A&L)-like structure within the SAE chain of command to ensure that appropriate support-system design considerations are incorporated into product development processes and that operations support has equal influence as a new system is developed.[8] This option provides the same mechanism to enforce appropriate sourcing criteria as in Option 1.

[8] By *A&L-like structure*, we mean having acquisition and logistics equally represented at the same level of authority.

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This option addresses AFMC's second product development goal:

- Improve processes to reduce weapon system life-cycle costs.
  - Introduce enterprise support-system design planning early in development.
  - Apply support-system design criteria consistently across programs.

The Goldwater-Nichols Department of Defense Reorganization Act of 1986 (Pub. L. 99-433) established defense and service acquisition executives (SAEs) to oversee all product development functions. The Air Force designated SAF/AQ as its SAE and made the Deputy Assistant Secretary of the Air Force for Logistics (SAF/IEL), the Deputy Chief of Staff for Logistics, Installations, and Mission Support (AF/A4/7), and AFMC responsible for support-system design policy. This resulted in tension among SAF/AQ, SAF/IEL, AF/A4/7, and AFMC as they tried to balance competing product development/support-system design needs during product development. Non-market microeconomic theory can be used to clarify responsibilities among actors contributing to accomplishing a task or an objective. It identifies three roles: a demander who requires effective support, a supplier who provides the support efficiently, and a neutral integrator who balances efficiency and effectiveness considerations. This theory can also be used to place into a common framework the contributions of multiple entities and organizations working to achieve some common objective.[9] In this option, we evaluate how the Air Force could assign roles and responsibilities to better balance product development/support-system design requirements.

Both the Navy and Army face issues that are similar in many ways to those faced by the Air Force.[10] Both services have an A&L-like organization at the secretariat level.[11]

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[9] See Glenn A. Kent, *A Framework for Defense Planning*, Santa Monica, Calif.: RAND Corporation, R-3721-AF/OSD, 1989, and David E. Thaler, *Strategies to Tasks: A Framework for Linking Means and Ends*, Santa Monica, Calif.: RAND Corporation, MR-300-AF, 1993.

[10] Both the Army and the Navy are having issues with the alignment of their acquisition support organizational structure. Acquisition reporting chains specifically exclude the organizations that fall under the Chief of Staff of the Army and the Chief of Naval Operations. Both services are struggling with the division between product development lines of authority and their respective operating commands. This division of labor causes difficulty when either group needs support from the other (for example, organize, train, and equip functions or requirements definition refinement). Both services are trying to bring the operating commands back into product development to balance concerns and related activities. See U.S. Army, *Army Strong: Equipped, Trained, and Ready, Final Report of the 2010 Army Acquisition Review*, January 2011, and Charles Nemfakos, Irv Blickstein, Aine Seitz McCarthy, and Jerry M. Sollinger, *The Perfect Storm: The Goldwater-Nichols Act and Its Effect on Navy Acquisition*, Santa Monica, Calif.: RAND Corporation, OP-308-NAVY, 2010.

[11] The Navy's current structure is similar to the proposed AFMC reorganization, with PEOs aligned by platform type (that is, ships are in Naval Sea Systems Command, or NAVSEA, and aircraft are in the Naval Air Systems Command, or NAVAIR). In NAVAIR, the commander is responsible for aircraft operations support, product development (acquisition), and test. He or she manages functional personnel under a civilian competency alignment in which senior functional managers ensure that personnel receive training, education, experience, and

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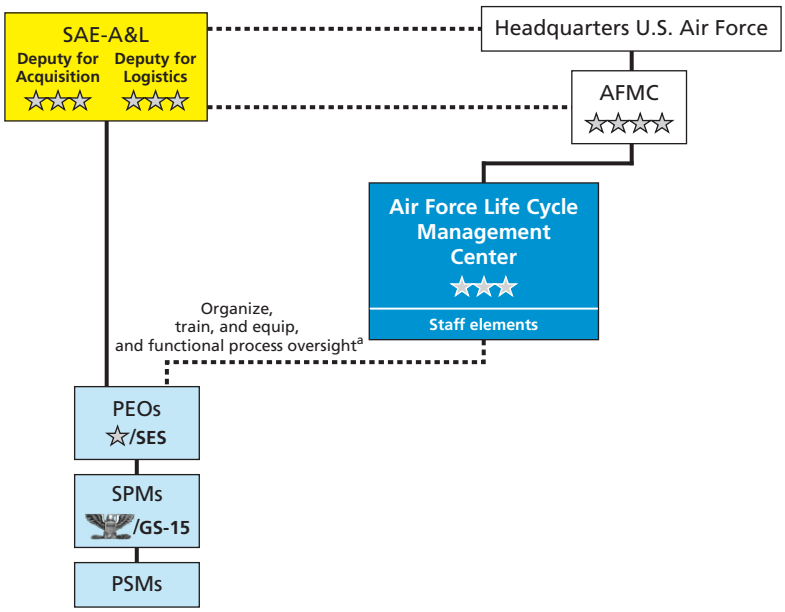
To help delineate the roles and responsibilities needed to achieve a better balance between product development/support-system design requirements, we propose an organizational change at the secretariat level (see Figure 5.3). SAF/AQ could become an A&L-like structure. The SAE (a neutral integrator) would have two deputies: one for acquisition and one for logistics.[12] The director of acquisition could provide product development policy, and the deputy for logistics could provide support-system design policy. The A&L organization could enforce best-practice policy uniformly across programs and direct that enterprise support-system design criteria developed by the AFLCMC be applied to each program. This would ensure that enterprise capabilities, both contract and organic, and the competitive advantages of each are considered in operations support design efforts early in product development.

Figure 5.3
Model for an A&L Structure Within the SAE to Enforce Support-System Design Considerations in Product Development Processes



[a] SAF/AQ provides SAE process oversight.
NOTE: The change to the proposed reorganization is shown in yellow.
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assignments to continually develop a qualified cadre. The Army leverages areas of specialization through the Army Materiel Command and other commands (for example, Information Systems Command, Installation Management Command).

[12] This is similar to an idea, formulated in 2002, to create two new three-star general officer positions—one for an "acquisition commander" and the other for a "sustainment commander," within AFMC. It is also similar to AFMC's establishment of a deputy for acquisition and a deputy for support in the product centers in 2004. (See Appendix B for a complete history of Air Force life-cycle management.)

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Option 3: Standardize Best-Practice Product Development and Operations Support Core Processes

With this option, we recommend standardizing and institutionalizing core best-practice product development and operations support processes. The example presented in this section is an operations support process: continuously improving maintenance processes by integrating program management engineering capabilities with maintenance processes horizontally and vertically across air logistics complexes and among wings. However, in a similar manner, product development processes could be continuously improved, standardized, and streamlined across all programs.

This option addresses AFMC's first product development goal and first and third operations support goals:

- Improve processes to rapidly deliver capable, cost-effective, and supportable systems for the warfighter.
  - Standardize core "best-practice" product development processes and tailor them based on specific weapon system product development requirements.
  - Eliminate nonproductive processes and bureaucracy.
- Establish a logistics network that is right-sized to meet dynamic mission generation unit needs focusing on depot maintenance and supply chain operations.[13]
  - Standardize and simplify processes.
  - Eliminate nonproductive processes and bureaucracy.
  - Improve operations support productivity.
  - Institute maintenance process improvements (for example, high velocity maintenance).

Option 3 is based on process reengineering practice in which business processes are continuously refined through redesign or reengineering to improve on critical performance measures (for example, cost, quality, service, speed).[14] Non-value-added processes are eliminated, and standard repeatable processes are developed across like functions, such as product development functions, maintenance practices, inspections, and enforcement guidelines. The goal is to improve performance (that is, to increase effectiveness and/or efficiency). The result should feature simplified business processes, flatter organizational structures, customer-focused satisfaction, personnel incentivized to foster continued process improvement, and metrics that relate inputs to outputs over time.

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[13] Mission generation units launch and recover aircraft and are capable of launch-and-recovery and remove-and-replace maintenance only.

[14] Michael Hammer and James Champy, *Reengineering The Corporation: A Manifesto for Business Revolution*, rev. ed., New York: HarperCollins Publishers, 2001.

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As an example, the Air Force's Repair Network Integration (RNI) initiative reengineers intermediate-level maintenance processes by grouping like functions into a network of centralized repair facilities (CRFs), creating lean mission generation units at the base, and consolidating certain wing-level scheduled maintenance tasks and off-equipment component repairs at CRFs to meet operational needs efficiently.[15] Recent RAND research demonstrates that consolidating inspections and backshop maintenance activities is more efficient because it capitalizes on economies of scale in network CRF maintenance activities.[16] It is also more effective because consolidation can speed the flow of aircraft through isochronal and phase inspections including associated component repairs. Thus, fewer aircraft are tied up in maintenance processes at any given time, making more aircraft available to the operational community. And with manpower dedicated to these types of repair, the experience level of maintainers can be expected to rise quickly, creating the potential for more gains. Figures 5.4 and 5.5 provide examples of manpower and aircraft flow-time efficiencies for the C-130 aircraft with the use of CRFs to conduct isochronal inspections. Similar analyses were completed for the F-16 and the KC-135 with comparable findings.[17]

The left bar in Figure 5.4 shows that the current system's total cost is approximately $890 million, with blue representing manpower costs and red representing the cost of shuttling aircraft to an existing CRF.[18] The right bar shows savings from centralizing some C-130 intermediate-level maintenance workload for active duty and Air Force Reserve Command aircraft. The total cost is approximately $130 million less per year than that under the current system.[19] Most of the cost savings is in manpower. According to the analysis, the same work can be performed with about 2,500 fewer personnel.[20]

Figure 5.5 shows how centralized inspections reduce flow days, which, in turn, reduces the number of aircraft undergoing inspection, resulting in more aircraft available for operational use. The left bar shows that approximately 53 aircraft are in the inspection or refurbishment process at any given time in the current system. Moving to a C-130 CRF network that supports the active duty and Air Force Reserve Command

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15 In the current system, every wing maintains its own maintenance capabilities to support these activities.

16 Less manpower is needed at each base because there is no longer a need to maintain minimum crew sizes or to maintain staff to work unanticipated demands. See Robert S. Tripp, Ronald G. McGarvey, Ben D. Van Roo, James M. Masters, and Jerry M. Sollinger, *A Repair Network Concept for Air Force Maintenance: Conclusions from Analysis of C-130, F-16, and KC-135 Fleets*, Santa Monica, Calif.: RAND Corporation, MG-919-AF, 2010.

17 However, CRFs may not be appropriate for all weapon systems. For more details on the CRF analysis, see Tripp, McGarvey, et al., 2010.

18 Air Force Special Operations Command has a CRF at Hurlburt AFB to conduct isochronal inspections for most of its special-purpose C-130s. These are the shuttle costs under the current system.

19 Note that the savings associated with the process change for the C-130 are greater than those identified in the reorganization planned by AFMC.

20 See Tripp, McGarvey, et al., 2010.

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Figure 5.4
Creating Efficiencies by Centralizing Some C-130 Intermediate-Level Maintenance Workloads

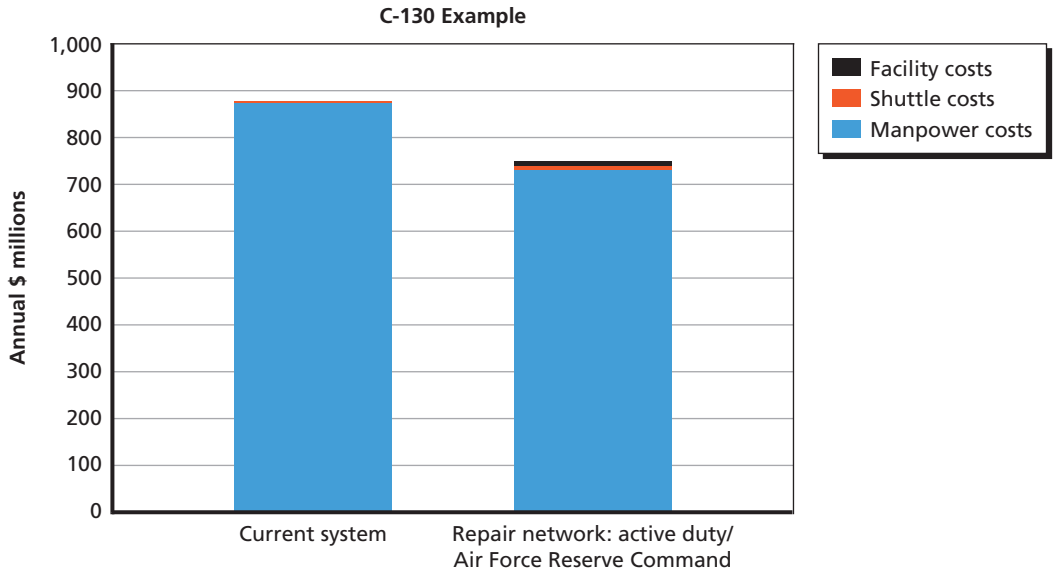

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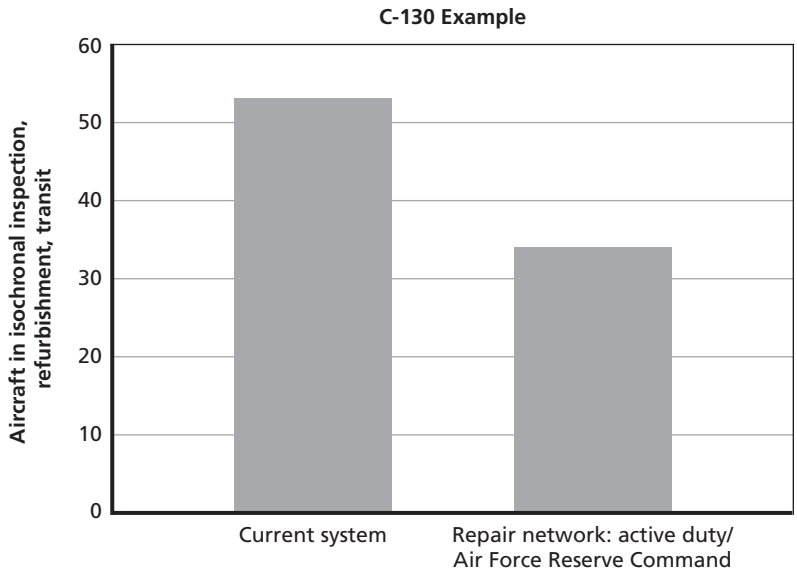
Figure 5.5
Increasing Available Aircraft by Reducing C-130 Phase Flow Times at CRFs



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fleet, the number of aircraft in the isochronal process could drop to approximately 34 aircraft, making almost 20 additional aircraft available to operational units.[21]

Another maintenance reengineering initiative, high velocity maintenance, is related to and can enhance RNI efforts. This approach uses collaboration and advanced knowledge of specific aircraft to tailor programmed depot maintenance support. It is an example of horizontal integration, as discussed earlier. Advanced planning and pre-induction inspections provide information about the condition of the aircraft to the depot so that SPMs, depot maintenance personnel, and supply chain personnel can tailor work packages and develop supportable work plans to meet the needs of each aircraft. Knowing the aircraft condition, dedicating manpower as needed, and having the right parts at the right time will increase velocity and reduce depot-possessed time.[22]

Integrating the high velocity maintenance approach and the RNI concept could lead to even greater effectiveness and efficiency. For example, locating a consolidated inspection site (a CRF) at an air logistics complex collocates program management, maintenance, and supply chain personnel, a step that could improve integrated support like the Maintenance Requirements Supportability Process (MRSP) teams at WR-ALC.[23] At the strategic level, this collocation helps with building the weapon system engineering brochure. At the operational level, a yearly programmed depot maintenance schedule can be built. And at the tactical level, each aircraft induction would have individual work packages tailored to its specific needs. A consolidated inspection site can turn more aircraft, which could potentially provide additional time and money that could be used to record aircraft conditions for future programmed depot maintenance.

The Air Force is pursuing a similar approach for product development called high velocity acquisition. When implemented, it will reportedly streamline and accelerate the process of delivering a fielded capability to the warfighter by integrating ongoing activities and developing and implementing standard product development processes.[24]

The proposed reorganization provides opportunities to further improve and standardize maintenance (and product development) best practices across the enterprise.[25] These processes should be institutionalized, codified in doctrine and instruction, and

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[21] See Tripp, McGarvey, et al., 2010.

[22] High velocity maintenance is currently being implemented at Robbins AFB, Georgia, for the C-130.

[23] The MRSP team includes subject-matter experts, SPMs, and maintenance wing, SCMG, and Defense Logistics Agency personnel. It conducts requirements and supportability activities. See Warner Robins Air Logistics Center, 2012.

[24] See Air Force Materiel Command, Aeronautical Systems Center, "High Velocity Acquisition," briefing, May 17, 2011, and "In Step with Lieutenant General Tom Owen: Making Things Better," 2011.

[25] This process enhancement could address some of the issues identified by the National Research Council's Committee on Examination of the U.S. Air Force's Aircraft Sustainment Needs in the Future and Its Strategy to Meet Those Needs, including standardized processes and an organizational structure to implement those processes with a single commander in charge. See National Research Council, 2011.

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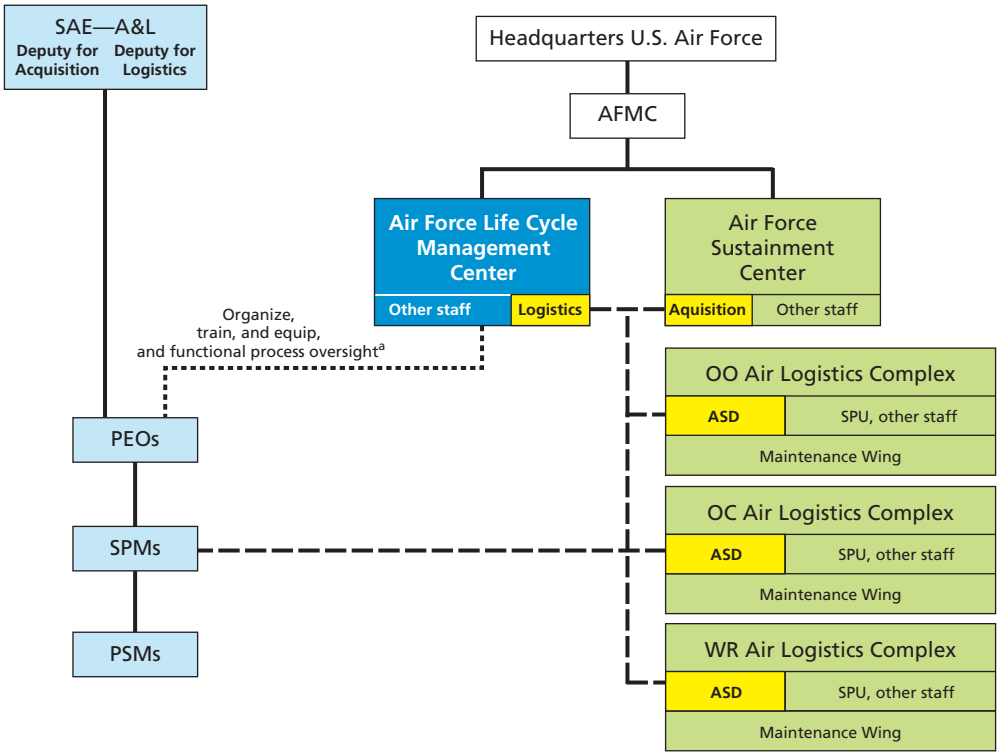
monitored for needed refinement or alteration. As an illustration, the new ASDs in the new structure will report to the air logistics complex commander. We suggest that the individual efforts of each new ASD can be harnessed to aid in standardizing operations support across the air logistics complexes, for example by institutionalizing high velocity maintenance processes. In Figure 5.6, we show the creation of what we call an *acquisition staff* under the AFSC and a *logistics staff* under the AFLCMC. These staffs could support the horizontal integration of program management, maintenance, and supply personnel; facilitate enterprise-wide continuous process improvement activities; and standardize core best-practice process support activities across the centers, such as the support-system design discussed in Option 1. AFSC's acquisition staff, along with engineering and logistics, could coordinate the standardization of operations support processes across air logistics complexes and provide oversight of the new ASDs. AFLCMC logistics staff could provide training to SPMs on integrated operations support processes, along with engineering, and AFSC acquisition staff could provide training to the new ASDs on integrated product development processes.

Figure 5.6
Standardizing, Integrating, and Streamlining Product Development and Operations Support Best Practices with an AFLCMC Logistics Staff and an AFSC Acquisition Staff



[a] SAF/AQ provides SAE process oversight.
NOTE: The changes to the proposed reorganization are shown in yellow.
RAND *MG1219-5.6*

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Likewise, the proposed reorganization provides opportunities to standardize best practices and streamline product development processes. The results from implementing high velocity acquisition can be used to evaluate any further suggested process or organizational changes. Furthermore, to ensure that the processes are balanced and that the organizational structure supports them, the inspector general can check, monitor, and report on the AFMC reorganization to highlight needed process refinement or alterations.

Option 4: Improve Command and Control Support to the Warfighter

With this option, we recommend institutionalizing the proactive assessment of logistics, and, more broadly, agile combat support (ACS) capabilities as part of the component Numbered Air Force (C-NAF) course of action (COA) selection and execution. Integrating supply chain (including maintenance process) assessments into C-NAF COA processes, will help identify ACS capabilities and constraints, inform C-NAF planners, and develop mitigation strategies so that Air Force supply chains can better meet warfighter needs.

This option addresses AFMC's second operations support goal:

- Establish a logistics C2 capability to proactively orchestrate enterprise actions to meet operational needs in the execution time horizon.

This option is based on both C2 and electrical engineering control theory. Specifically, C2 theory calls for assessments of how ACS resource levels and process performance will affect operationally relevant metrics, the identification of enterprise-level constraints and the impacts of those constraints on operational metrics, and the identification of mitigation strategies (for example, depot surge, emergency buys, reallocation of serviceable resources) to resolve resource shortages.[26]

Electrical engineering and other control theories call for establishing resource-control parameters.[27] Once a supportable plan is developed and executed, it should be monitored to gauge actual ACS resource levels and process performance against planned values. When the system goes beyond acceptable limits (that is, when levels or processes need correction), the control system should signal the appropriate ACS resource manager to take corrective action.

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[26] Robert S. Tripp, Kristin Lynch, and John G. Drew, *Improving Air Force C2 Through Enhanced ACS Planning, Execution, Monitoring, and Control Processes*, Santa Monica, Calif.: RAND Corporation, MG-1070-AF, forthcoming.

[27] Stafford Beer, *Decision and Control: The Meaning of Operational Research and Management Cybernetics*, Chichester, UK: John Wiley and Sons, 1966.

Pre-Publication Copy: Not Cleared for Open Publication. Do not cite or quote.

There has always been a mismatch between the availability of combat support resources and process performance and the capabilities needed to support military operations. Because of these imbalances, operational commanders, higher authorities who prioritize and allocate scarce resources among operational commanders, and resource providers need to know how combat support enterprise constraints and alternative resource allocation decisions would affect planned and potential operations. For example, Figure 5.7 shows a notional fully armed sortie generation profile for a given weapon system that might be required to achieve desired operational effects as part of an operations plan (OPLAN). This plan runs for 84 days and has surge demands on day 48.

Figure 5.8 shows how three commodity supply chains (ammunition, fuel, and spare parts) might affect sortie generation capability in the same area of responsibility (AOR X, in this case). As the figure shows, the sortie production capabilities cannot meet the operational requirements as outlined in the contingency plan, first because of ammunition- and fuel-limiting factors and then because of spares constraints. We focus on the spare parts shortage (shown in red hachure marks) in the remainder of this example.

To meet the combatant commander–specified sortie generation requirements, combat support capabilities can be reallocated from another AOR. Figure 5.9 illustrates how sortie generation capabilities can be increased by reallocating spares from AOR Y to AOR X. The solid green line (representing spares) moves up, eliminating shortages during surge operations.

Figure 5.7
Notional OPLAN Fueled and Armed Sortie Requirements

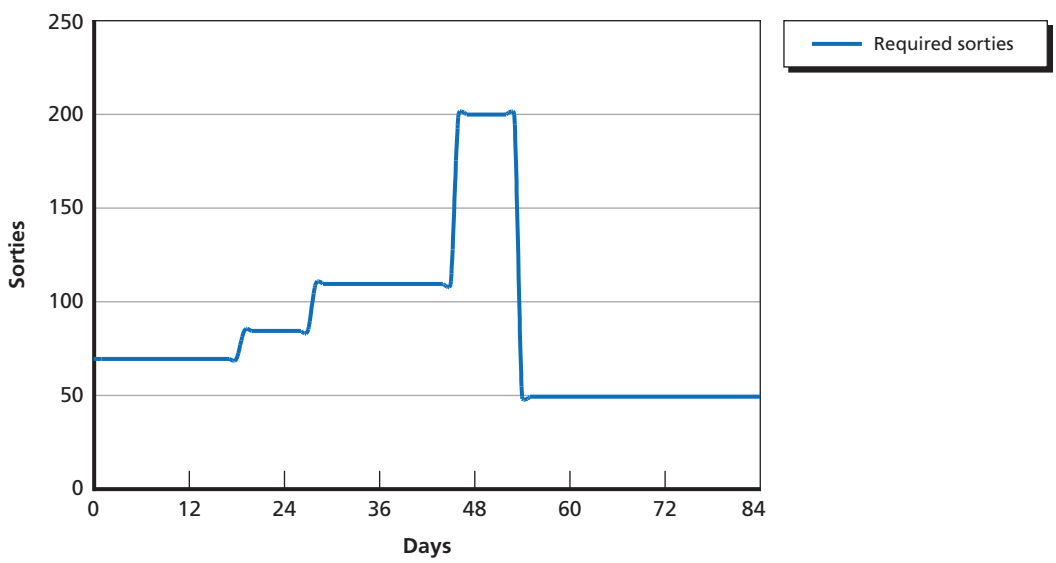

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Figure 5.8
Notional Effects of ACS Resource Constraints on Operations

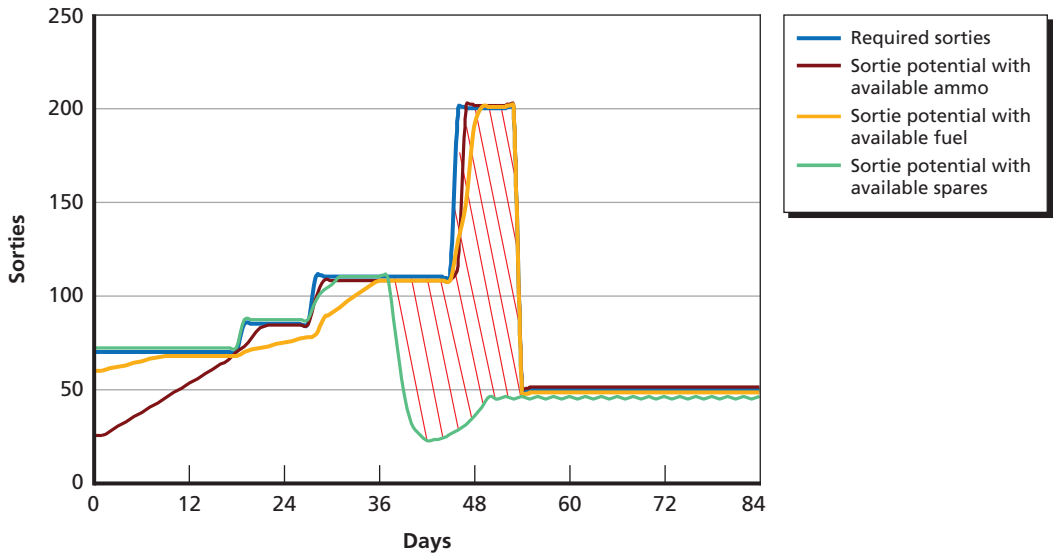

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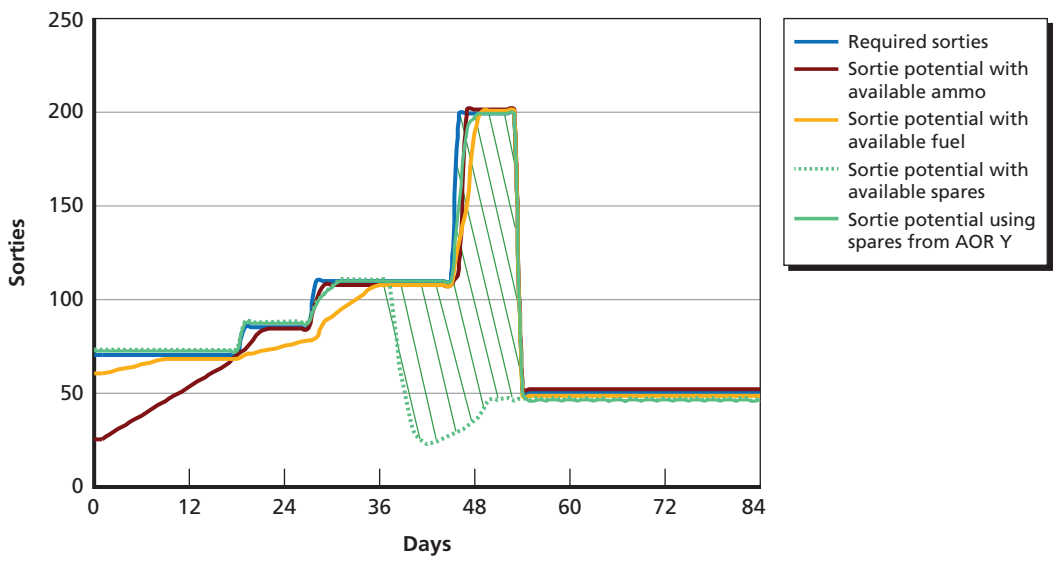
Figure 5.9
Reallocating Resources from Another AOR to Meet Operational Requirements



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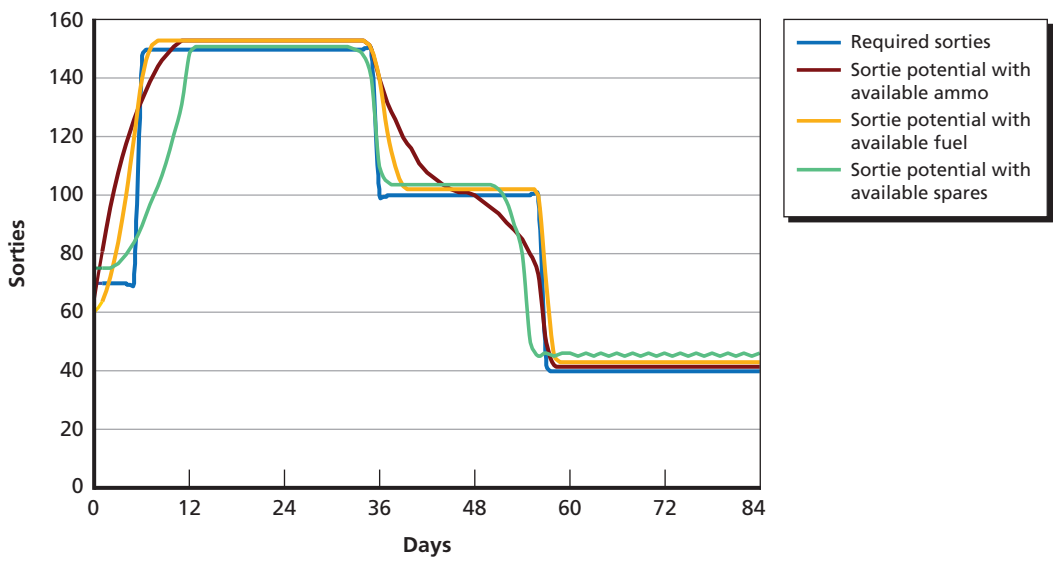
However, the sortie generation capability in a second AOR (AOR Y) will decrease as a result of reallocating these assets. Figure 5.10 shows the original assessment of AOR Y's operational capability to meet wartime requirements.

Figure 5.11 illustrates the effects on AOR Y's operational plan when spares are reallocated to AOR X.

Currently, there are incomplete methods and no organization tasked with the responsibility to integrate and balance individual ACS assessments into a set of capabilities that can be used in C-NAF planning and replanning. However, these concepts were demonstrated during Joint Expeditionary Force Experiment 11-1 in January 2011 by the Air Force Command and Control Integration Center as part of the Agile Logistics EXperiment (ALEX). During ALEX, the AFC2IC stood up an ACS cell in the operational support facility at the Ryan Center (Langley AFB, Virginia) to conduct ACS assessments for existing OPLANs.[28] As part of the COA selection process for two participating C-NAFs, individual resource capabilities and constraints were evaluated for several resources (that is, civil engineers, security forces, spare parts, war reserve materiel, communications, medical, and engines). Then, several stovepiped assessments were integrated to show C-NAF staffs the extent to which they could

Figure 5.10
Notional OPLAN Fueled and Armed Sortie Requirements for AOR Y Before Resources Are Reallocated to AOR X



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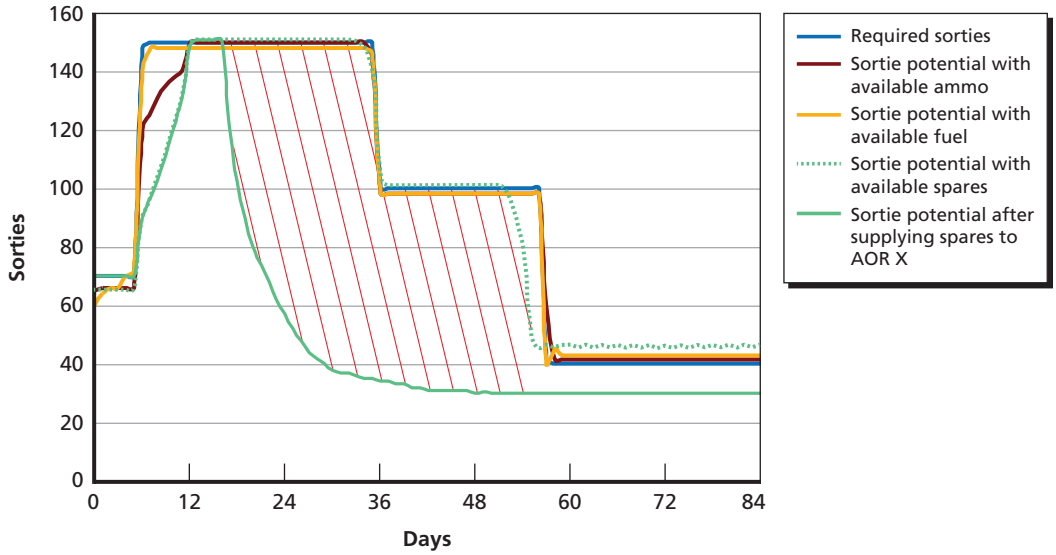
[28] See Air Combat Command, Air Force Command and Control Integration Center, Joint Expeditionary Force Experiment 2011, *Agile Logistics Evaluation eXperiment (ALEX): Final Report*, JEFX 11-1, April 25, 2011, and Air Combat Command, Joint Expeditionary Force Experiment, *2011 ALEX II Limited Objective Experiment Final Report*, November 8, 2011.

Pre-Publication Copy: Not Cleared for Open Publication. Do not cite or quote.

Figure 5.11
Notional OPLAN Fueled and Armed Sortie Requirements for AOR Y After Resources Are Reallocated to AOR X



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expect to generate sorties or open forward operating locations, given the resource capabilities and constraints.[29] Finally, the experiment involved performing a number of supportability assessments. ALEX demonstrated how the prioritization scheme could affect OPLANs. For example, OPLAN X received priority over OPLAN Y, then OPLAN Y received priority over OPLAN X, and, finally, both were given equal priority. Each time, an ACS assessment was performed to determine whether existing levels of personnel and resources could support the priority OPLAN and to demonstrate the effect on the OPLAN with lower priority. During the experiments, there were not always enough resources to meet the OPLAN requirements, and command-level mitigation decisions were required.

ALEX demonstrated the ability to use a small reachback cell to perform ACS assessments to identify capabilities and constraints. It also showed the need for several organizations and for individual resource assessments to be combined and integrated to determine how all resources interrelate in terms of affecting operational objectives and capabilities. A supply chain manager could be responsible for integration across all mission generation resources (for example, spare parts, fuels, engines, munitions), and an installations manager could oversee all installation support resources (for example, civil engineering, communications, and health services). There should also be one orga-

[29] A RAND team developed and used the Forward Operating Location Assessment Model to assess *open-the-base* capabilities during the ALEX series of experiments.

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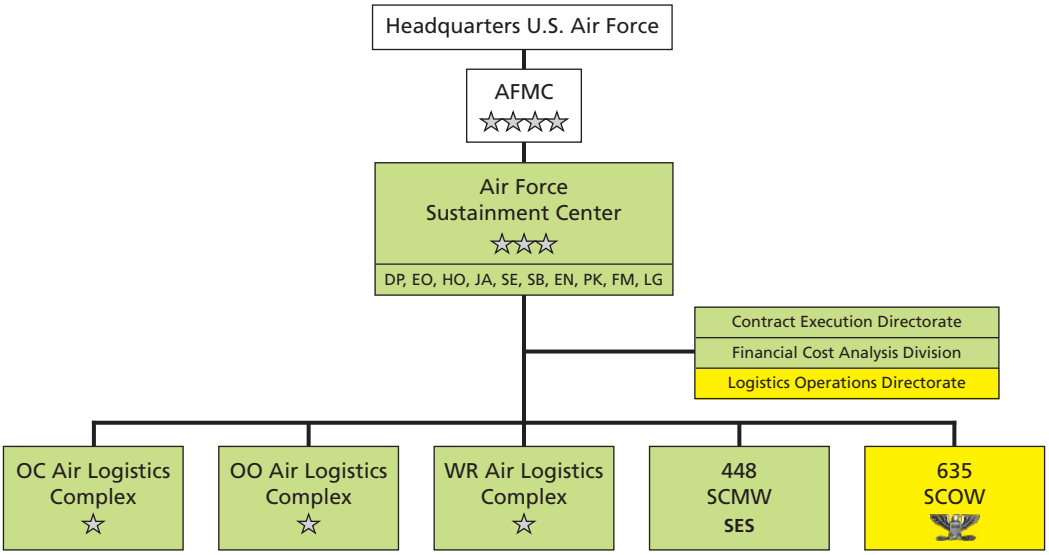
nization with the authority to balance resources across competing demands and make allocation decisions.

The proposed reorganization provides an opportunity to improve proactive C2 of ACS resources. The AFSC could assume responsibility for these resources and become AFMC's C2 interface with C-NAF warfighters (see Figure 5.12). C2 process changes are required for continuous monitoring and control of ACS resources and supply chain capabilities, performing routine OPLAN logistics sustainment assessments, and providing comprehensive ACS information to decisionmakers for COA development or replanning. Existing C2 capabilities (in the Logistics Operations Division and in the 635 SCOW) could be centralized and staffed appropriately. The proactive C2 activities in the Logistics Operations Division could be shifted to the 635 SCOW to manage with its existing day-to-day responsibilities.

As stated earlier, each of the options presented in this chapter can be implemented within the proposed AFMC organizational construct. Each is independent of the others, and they are not presented in any particular order. We present an additional option for consideration in Appendix F : further consolidation of mission-area support. Since this option extends beyond the scope of this study, we did not include it in the main text. This area of interest, along with several others, requires further evaluation.

Figure 5.12
Combining C2 Capabilities in the Warfighter-Focused 635th Supply Chain Operations Wing



NOTE: Changes to the proposed reorganization are shown in yellow. AFSC functions are as follows: DP (manpower and personnel), EO (equal opportunity), HO (command historian), JA (staff judge advocate), SE (safety), SB (small business), EN (engineering and technical management), PK (contracting), FM (financial management), LG (logistics).

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Other Areas for Consideration

As we assessed the AFMC reorganization, we noted several other areas related to the proposed organizational change that may merit future examination. There are thousands of manpower authorizations associated with Headquarters AFMC, AFLCMC, AFSC, and SAF/AQ staffs. As a result, there may be further opportunities to align functions and streamline staffs across these organizations and thus increase efficiencies in both product development and operations support.

The SAE was established 25 years ago under the Goldwater-Nichols Department of Defense Reorganization Act and National Defense Authorization Act for FY 1987. From our assessment of the AFMC reorganization, it appears that the Air Force implementation of the acquisition organization supporting the SAE should be reexamined in conjunction with reconciling the product development staffs.

We briefly discussed the development of leading indicators to gauge AFMC's performance under the new organizational structure. More work is needed to determine the correct metrics to drive and assess improvements in overall effectiveness (for example, decreasing the time to contract award), efficiency (for example, improving aircraft availability), and horizontal integration.

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CHAPTER SIX

Conclusions and Recommendations

The purpose of this analysis was to provide the Secretary of the Air Force with an independent review and assessment of the reorganization proposed by AFMC as required by the National Defense Authorization Act for FY 2012. In summary, we found that AFMC's manpower and cost-reduction estimates were consistent with our assessments, and all critical line functions appear to remain in the proposed organizational structure.

As with all organizational structures, the new structure offers opportunities for enhancements, as well as some areas that may pose challenges in the future. AFMC has developed mitigation strategies for several of the challenges, but some challenges need further examination. The impact of the reorganization on effective support to the warfighter and product efficiencies is currently unknown and will depend on how the proposed reorganization is implemented over time. In addition, many factors outside the reorganization will determine effectiveness and efficiencies—for example, leadership focus, resource constraints, and other ongoing process improvements.

In Chapter Five, we presented four options for the Air Force to consider in an effort to strengthen AFMC's ability to achieve its objectives. Each option aimed to meet a goal, address a challenge, or leverage an opportunity identified in our analysis. We focused on process enhancements that have the potential to improve effective support to the warfighter and the efficiency of operations. In addition, we identified several areas related to the reorganization that could benefit from further evaluation.

Recommendations

As AFMC implements its proposed organizational structure, we put forward the following recommendations:

- The command should concentrate on functional process improvements and coordinate with the secretariate on SAE processes.
- Metrics should be developed to track the effectiveness and efficiency of the new organization and processes.

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- If problems are uncovered, the Air Force should identify the root cause, fix the underlying issue, and continue to monitor performance.

Finally, we recommend that the Air Force consider implementing the four process enhancements presented in Chapter Five and listed here:

- Improve enterprise support-system design planning.
- Enforce enterprise support-system design planning guidance early in the product development process.
- Standardize best-practice product development and operations support core processes.
- Improve C2 support to the warfighter.

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APPENDIX A

National Defense Authorization Act for Fiscal Year 2012 Requirements and RAND Project AIR FORCE Project Description Taskings

This appendix presents the requirement for this analysis specified in Section 326 of the National Defense Authorization Act for FY 2012, as well as the project description tasks for the RAND Project AIR FORCE research. The taskings align with the requirements of the legislation.

National Defense Authorization Act for Fiscal Year 2012, Section 326

(b) Report on the Alignment, Organizational Reporting, Military Command Structure, and Performance Rating of Air Force System Program Managers, Sustainment Program Managers, and Product Support Managers at Air Logistics Centers or Air Logistics Complexes-

(1) Report Required—The Secretary of the Air Force shall enter into an agreement with a federally funded research and development center to submit to the congressional defense committees, not later than 180 days after the date of the enactment of this Act, a report on the alignment, organizational reporting, military command structure, and performance rating of Air Force system program managers, sustainment program managers, and product support managers at Air Logistics Centers or Air Logistics Complexes.

(2) Elements—The report required under paragraph (1) shall include the following elements:

(A) Consideration of the proposed reorganization of Air Force Materiel Command announced on November 2, 2011.

(B) An assessment of how various alternatives for aligning the managers described in subsection (a) within Air Force Materiel Command would likely support and impact life-cycle management, weapon system sustainment, and overall support to the warfighter.

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(C) With respect to the alignment of the managers described in subsection (A), an examination of how the Air Force should be organized to best conduct life-cycle management and weapon system sustainment, with any analysis of cost and savings factors subject to the consideration of overall readiness.

(D) Recommended alternatives for meeting these objectives.

RAND Project Description

The following task list is excerpted directly from the descriptions provided to the PAF research team.

Task 1: Describe the proposed reorganization that AFMC announced November 2, 2011.

List all AFMC functions mentioned in the reorganization and identify where functional responsibility currently resides, providing a list of all AFMC personnel positions involved and identifying their disposition.

Task 2: Assess the proposed AFMC reorganization.

Provide an independent assessment of the costs and benefits of the AFMC realignment of these functions and how they would likely support and affect life-cycle management, weapon system sustainment, and overall support to the warfighter.

Task 3: Examine how the Air Force should be organized to best conduct life-cycle management and weapon system sustainment, with any analysis of cost and savings factors subject to a consideration of overall readiness.

Evaluate how the proposed AFMC reorganization compares to the present organization and identify possible alternatives within the current budget realities and in relation to the proposed reorganization that would enhance readiness, life-cycle management, weapon system sustainment, and overall support to the warfighter.

Task 4: Recommend alternatives for meeting these objectives.

Provide any alternatives that achieve the civilian personnel ceiling contained in FY2012PB RMD 703 while performing life-cycle management and weapon system sustainment functions providing overall support to the warfighter with analysis of cost and savings factors subject to the consideration of overall readiness.[1]

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[1] FY2012PB refers to the President's Budget for FY 2012.

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Task 5: Preparation of required report as mandated by Section 326.

This task will develop the report necessary to meet the intent of Section 326, subsection (b).

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APPENDIX B

A History of Air Force Life-Cycle Management

In this appendix, we present a summarized compilation of the histories of acquisition and sustainment in the U.S. Air Force.[1] This material was taken from Air Force and AFMC histories and purposely uses their words and facts and to identify when issues first appeared and how often they have resurfaced through the present.[2] For early periods and post–World War II to 1992, we rely mostly on a select few primary sources and authors whose labors enabled us to cover this period thoroughly in the short time available for this appendix's preparation. After 1992, we relied on official histories made available to us as with all data by AFMC's History Office.

This appendix represents Air Force views of the past rather than our interpretation. We use these views to identify successes, failures, and periods when there was little or no contention between organizations but, instead, more cooperation. If a solution was found that satisfied different factions, even for a short period, we identify it. We incorporated this history into our analysis of options and alternatives.

AFMC was officially established on July 1, 1992. What follows is an overview of events leading to its activation, beginning with some highlights of the earliest days of military aviation, when certain issues in acquisition and sustainment—the latter then known as logistics—emerged repeatedly and eventually led to AFMC's formation. Those issues are as follows:

- how to organize to best support the customer (warfighters)
- how systems are best developed and acquired
- how life-cycle responsibilities are best shared among different skill sets.

In his history of the beginnings of AFMC, H. P. "Scott" Carlin states that

[1] In the body of this report, we refer to acquisition-type processes as *product development* and sustainment or logistics as *operations support*. In recounting the history, we adopt the terminology that was used at that point in time.

[2] Accuracy of presentation was of utmost importance. The documents referenced here have undergone both the scrutiny and approval of the Air Force leadership.

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> though not always a source of contention, the issues concerning acquisition and sustainment all stemmed from the common problem of finding an effective way to manage a weapon system over its life cycle or "cradle-to-grave." Over the years, the answer to that depended on the viewpoint of those responsible for the solution, which in turn was governed by the needs and circumstances of the times. The hardly surprising result was that a satisfactory answer to one generation might be regarded as inadequate by another.[3]

The Beginnings: 1917–1951

In 1917, the Army Signal Corps controlled aviation and established the three basic functions of materiel support: research and development (R&D), supply and maintenance, and procurement and production, organized as distinct and separate entities. "Separating and joining of support services did not have the significance of later years. Nevertheless, the precedent for separating and joining had been set."[4]

In late 1940, the Air Corps proposed to separate logistics from the Materiel Division, and a separate command, the Maintenance Command, was established in 1941. In the summer of 1941, the Maintenance Command was replaced with a new organization, the Air Service Command (ASC). The Air Service Command was separated from the Materiel Division and placed directly under the chief of the Air Corps. In March 1942 the Army reorganized into three coordinate branches: Army Ground Forces, Army Service Forces, and Army Air Forces (AAF). The forces of these commands, along with the Air Service Command, were placed directly under the AAF. Under the Air Service Command, 11 air depot control area commands were created at existing depots, such as Ogden Air Materiel Area (OAMA).[5]

For most of the war, support services were divided between two organizations: the Materiel Command, responsible for R&D and procurement, and the Air Service Command, in charge of the maintenance and the distribution of supplies. Both were located in Dayton, Ohio, one at Patterson Field and the other down the road at Wright Field.[6] Air Service Command's role was to determine needs and initiate the authority to purchase and the Materiel Command's role was to make the purchase.

Meanwhile, the Air Staff had begun to consider the possibility of combining the Air Service Command, the Materiel Command, and even the Air Transport Com-

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[3] H. P. Carlin, *Building a New Foundation: Plans and Preparations for Establishing The Air Force Materiel Command*, Wright-Patterson AFB, Ohio: Air Force Materiel Command, History Office, December 1992, p. 1

[4] Carlin, 1992, p. 1.

[5] Termena, Peiffer, Carlin, 1983, p. 49.

[6] Both main sources referenced in this appendix agree that it was not always easy to distinguish between the commands' respective responsibilities and that dozens of examples could be cited as evidence of their jurisdictional entanglements and duplication of efforts. Both cite spare part procurement as the best illustration.

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mand into one huge "air logistics command." The AAF had also begun to plan for the establishment of a separate Air Force and in August 1944; the Air Service Command and the Materiel Command were disestablished. One day later, their functions, separated over two years, were united again when a new command, the Air Technical Service Command (ATSC), was formally activated. The new command, located at Patterson Field, directed the logistical operations of the AAF through the end of the war. One year later, ten subordinate Air Technical Service Commands were redesignated Air Materiel Areas (AMAs) under the new Air Materiel Command (AMC) headed by Lt Gen Nathan F. Twining.[7]

The establishment of the U.S. Air Force in 1947 not only increased the responsibilities of the Air Materiel Command, but it also changed its fundamental organizational structure. After the war, Air Materiel Command's resources, which had once seemed limitless, became constrained and tightly managed. Once the Air Force was established, it was found to be missing "the one thing it needed most—centralized control." The Secretary of the Air Force, Stuart Symington, had clear ideas about how his new organization should be structured. Along with Air Force leaders and Lt Gen Nathan Twining, Symington hammered out a new design for the Air Materiel Command based on the premise that, at every echelon, the command should be rebuilt around its three principal operations: R&D, supply and maintenance, and procurement.[8]

Even though R&D was eventually established as a separate entity in the Air Materiel Command, some in the leadership grew dissatisfied with the position of R&D in a "large, service-oriented acquisition and logistics command."[9] As early as 1944, Gen Henry H. (Hap) Arnold directed the AAF's Scientific Advisory Group, headed by Theodore von Karman, to give him a blueprint of the technologies likely to influence AAF R&D in the decades ahead. The Scientific Advisory Group found that the air arm was indeed the key to the nation's defense and that science and technology were the key to an effective Air Force.[10] Michael Gorn, an AFSC historian, states that von Karman suggested establishing a separate R&D agency in the office of AAF chief of staff. Gen Curtis E. LeMay became the first Deputy Chief of Staff for R&D, but the position did not have the power to draw together the AAF's diverse R&D activities.[11]

According to Gorn, there was strong resistance to separating R&D entirely, perhaps because of the fear of a loss of resources under the existing structure's control. This lasted roughly until 1949, when supporters of R&D were able to appoint a special committee of the Air Force Scientific Advisory Board to take another look at R&D.

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7 Termena, Peiffer, Carlin, 1983, p. 68.

8 Termena, Peiffer, Carlin, 1983.

9 Carlin, 1992, p. 3.

10 Carlin, 1992, p. 3.

11 Michael H. Gorn, *Vulcan's Forge: The Making of an Air Force Command for Weapons Acquisition (1950–1985)*, Andrews AFB, Md.: Air Force Systems Command, History Office, 1989, p. 5.

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Lewis Ridenour chaired this group of scientists, whose September 1949 report contained a number of bold proposals. Among them were recommendations to establish an R&D command with strong ties to the Air Materiel Command, organize a Deputy Chief of Staff office for R&D at Headquarters U.S. Air Force, and approach R&D on a "system" basis, assigning task forces to particular weapon systems or components.[12]

On January 23, 1950, Headquarters U.S. Air Force established a Deputy Chief of Staff office for Development on the Air Staff and in the field, the Research and Development Command, renamed Air Research and Development Command (ARDC), in September 1950. The ARDC met resistance in having the Air Materiel Command transfer a major part of its responsibilities. Gen Hoyt S. Vandenberg, Chief of Staff of the Air Force, directed that by May 15, 1951, ARDC "will be capable of performing its mission as an independent self-sufficient major Air Force command."[13]

Gorn also notes that these developments did not proceed without jurisdictional questions. ARDC commander Lt Gen David M. Schlatter and his assistants believed that they should control the entire development process, including "in-service" engineering on equipment in field use. Air Materiel Command personnel felt that their responsibility ended when prototypes of new systems had been researched, developed, tested, and found adequate. As a result, General Vandenberg called in Gen James H. Doolittle to act as his special assistant on the ARDC–Air Materiel Command relationship. General Doolittle found that development continued through a system's entire life cycle. Therefore, he concluded, ARDC should control production engineering, and Air Materiel Command's proposal to establish a directorate of production and service engineering should be blocked.

General Vandenberg directed that, as of April 1, 1951, ARDC would report directly to Headquarters Air Force rather than to Air Materiel Command. All Air Materiel Command directorates of R&D, facilities, and so on would transfer to the ARDC. All future disputes between ARDC and Air Materiel Command would be resolved by General Doolittle or by the Chief of Staff of the Air Force. The proposed Air Materiel Command directorate would not be activated. The ARDC would provide engineering and laboratory and testing services to Air Materiel Command systems in production or service.[14] Carlin points out that the "dispute, though jurisdictional, was not petty, but represented a serious issue that was never satisfactorily resolved in the next four decades of divided weapon system management."[15]

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[12] Gorn, 1989, p. 12.

[13] Gorn, 1989, p. 19.

[14] Gorn, 1989, p. 20.

[15] Carlin, 1992, p. 4.

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Air Force Organizations Take Shape: 1951–1985

Air Force Chief of Staff General Vandenberg was one of the first to admit, however, that there could be no rigid dividing lines between the two commands. He pronounced in 1952 that "the [Air Materiel Command]–ARDC realignment does not mean a separation, but rather a close working relationship between our technical and production staffs." In other words, the two commands were already working together, and this had been the practice for some time.[16]

Weapon System Project Offices

Air Materiel Command became involved in what was known as weapon system management. The Air Force as a whole was moving in this direction. The central idea was to treat the aircraft, missile, or support system as a coherent whole. The challenge was in finding a central planning agent to integrate an entire project in advance and to oversee its development on a continual basis.

Faced with a shortage of personnel and wanting to avoid relying on a prime contractor to do this, the Air Force devised a system of joint project offices (JPOs). These offices were changed by an Air Force regulation to weapon system project offices (WSPOs) in 1953 and were first staffed with procurement (Air Materiel Command) and engineering (ARDC) personnel; supply and maintenance personnel were added later, along with representatives from the operational commands. Under the WSPOs, the problem of identifying a single point of "executive responsibility"—later, program management responsibility transfer (PMRT)—was solved by identifying a specific point at which responsibility shifted from the ARDC to the Air Materiel Command. The WSPO chief did not have the sole responsibility for a weapon system (after transfer), however. Decisions made by the project chief had to be approved by the commander of Air Materiel Command, who resisted centralizing that power in the project office.[17]

Jurisdictional Disputes Continue

There were major efforts by the Air Staff in 1953 to resolve the constant jurisdictional disputes and encourage "R&D people and product people to work together, to eat together, to work absolutely as closely as possible."[18] In October 1956, Air Materiel Command rejected a recommendation from the Deputy Secretary of Defense that ARDC project officers be given expanded authority (over facilities, funding, components, and supply). The commander of Air Materiel Command, Gen Edwin W. Rawlings, had a policy that no single organization could have total responsibility for

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[16] Carlin, 1992, p. 5.

[17] Termena, Peiffer, and Carlin, 1983, pp. 129–130.

[18] Carlin, 1992, p. 7.

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a weapon system. To underscore that philosophy, in late 1957, Air Materiel Command headquarters decided to substitute the term "weapon system integration" for "weapon system management." Rawlings and ARDC commander Gen William F. McKee defended this approach against pressure from Headquarters U.S. Air Force, stating confidently that the solution to the problems in this area lay in cultivating a climate of cooperation and understanding.[19]

The Air Force historians generally agree that even with the hard work of many people, initiatives like the WSPOs made painfully evident the problems brought about by dividing R&D and procurement functions between separate commands.[20]

The Origins of Two New Commands

Gorn indicates that there was sufficient recognition of the continuing tension inherent in the ARDC–Air Materiel Command relationship to prompt a number of in-house studies focused on the R&D and procurement dilemma during the 1950s. Gorn cites nine of them in *Vulcan's Forge*, but the most significant effort looking at the questions of weapon systems management, called "the Stever Report," recommended giving R&D project officers almost total control of their programs, including complete command of resources. It recommended that ARDC be decentralized and that deputy commanders to be put in charge of each distinct R&D area (research, technical development, weapon systems, and testing) and have complete program control within each.

ARDC commander Lt Gen Samuel E. Anderson, established an internal working group in November 1958 to review the Stever Commission report and make its own recommendations. The recommendations of the "Anderson Committee" were intended to give deputy and center commanders greater authority to execute programs and more control of resources. Lt Gen Bernard A. Schriever arrived in April 1959 and erected a new institutional structure for ARDC. It created four new divisions: the Air Force Ballistic Missile Division, for missiles and space; the Wright Air Development Division, for aeronautical and related systems; the Air Force Command and Control Division, for electronics R&D; and the Air Force Research Division, in Washington, D.C., for basic research. This new structure reflected a principal of program management: authority at the lowest operating level.[21]

In May 1959, Vice Chief of Staff Gen Curtis E. LeMay, established the Weapon Systems Study Group to review the applicability of ballistic missile concurrent development to "the entire structure of weapon systems development." Empowering the group to evaluate the acquisition process from initial concept to the retirement of systems, he asked it to study all institutional interrelationships among the Air Staff, ARDC, Air Materiel Command, the other commands, scientists, and industry. General Anderson,

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[19] Termena, Peiffer, and Carlin, 1983, p. 130.

[20] Gorn, 1989, p. 52; Carlin, 1992, p. 7.

[21] Gorn, 1989, p. 63.

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now commander of Air Materiel Command, chaired the group, which also included General Schriever and Air Staff members. To add depth, General Anderson invited a number of colonels from the operating commands to participate in a working group and make independent evaluations.

The group of colonels suggested that if the entire life cycle of a weapon system would henceforth be established in the conceptual phase of development, the whole acquisition process ought to be vested in one command. ARDC already managed preliminary aspects of weapon development, so the group recommended combining all Air Materiel Command acquisition functions under the ARDC R&D rubric. General Anderson—but not General Schriever—rejected the group's recommendations, as they ran counter to DoD's demands for centralization.

By February 1960, the group had not developed a compromise proposal, and, in March 1960, Air Staff Deputy Chief for materiel Lt Gen Mark E. Bradley offered a solution: "Assign ARDC executive management of all new weapon system programs until achievement of [initial operating capability] and completion of development milestones." But General Bradley's plan satisfied no one, and the debate continued. General Schriever wanted no less than full control of the entire acquisition process; remembering that the 1950 division of R&D and procurement into two commands had been nothing more than an act of institutional convenience, he argued that it turned out to be "a serious mistake because the control of dollars remained in [Air Materiel Command] while the responsibility for developing weapon systems was in ARDC."

General Schriever submitted his own plan for weapon system management to General Anderson, proposing a single command for R&D, production, and procurement and a separate but equal command devoted to logistics support. By dividing acquisition and logistics into two commands, the future and the present Air Force no longer had to compete for precious resources. Schriever's view offered a unique and persuasive insight into a problem that had dogged airpower organizations for years.

It took the space program, after the Soviet Union launched its manned orbiter, to give General Schriever the clout to resubmit his plan to redesignate the ARCD as Air Force Systems Command (AFSC) and the Air Materiel Command as the Air Force Logistics Command (AFLC). The Schriever Plan was resubmitted and received the approval of Gen White, Secretary of the Air Force Eugene Zuckert, and Secretary of Defense Robert McNamara. On March 8, 1961, all military airspace was conferred publicly to the Air Force. Six days later, General White announced the redesignation of ARDC and Air Materiel Command as Air Force Systems Command and AFLC, respectively. Air Force Systems Command would be responsible for "managing the acquisition of all system programs from development, test, and production [through] installation and checkout, [delivering] complete, timely and operable systems to the

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using commands." President Kennedy approved the action on March 18, 1961, and Air Force Systems Command was established on April 1, 1961.[22]

Early Acquisition Reforms

The events surrounding the war in Vietnam and the development of the C-5A Galaxy gave rise to general questions of U.S. military competency. The election of President Nixon provided an opportunity for reform. Deputy Secretary of Defense David Packard added several major acquisition reforms and the first priority of DoD was control of cost growth. "Cost realism," based on sophisticated cost-estimating techniques, would now be a major factor in contractor selection. Packard called for more precisely defined requirements prior to full-scale development, and he reintroduced the practice of prototyping—that is, direct "fly-off" competitions. In his first year, Packard made some momentous changes in the weapon system acquisition process.[23]

In the summer of 1969, the commander of Air Force Systems Command, Gen James Ferguson met with Packard, Secretary of the Air Force Robert C. Seamans, Under Secretary of the Air Force John McLucas, and Air Force Chief of Staff John D. Ryan and focused their attention on the impact of the initiatives on a major Air Force weapon project, the F-15 Air Superiority Fighter. They agreed to rapidly decentralize the program, transfer the F-15 program element monitor from Headquarters U.S. Air Force to Headquarters Air Force Systems Command and appointed a general office F-15 program director. By late 1969, program element monitor offices for the F-111, Minuteman, C-5A, A-7, and Airborne Warning and Control System programs had been shifted to Air Force Systems Command. Under the decentralized Packard system, the commander of Air Force Systems Command expected his system program offices to prudently balance performance, schedule, and cost in the programs they managed.[24]

Under the early Packard reforms, the process of developing, producing and procuring—known as the acquisition life cycle—would consist of five distinct phases: (1) concept, (2) validation, (3) full-scale development, (4) production, and (5) deployment. The last phase involved "the transfer to Air Force Logistics Command (AFLC) of systems ready for operational status." The issue of transfer was defined but there was clearly room for interpretation.

Rising Support Costs and the Question of Program Management Responsibility Transfer

In the early 1970s, operating and support (O&S) costs began to burgeon, and Deputy Secretary of Defense Bill Clements highlighted the need for increased "emphasis on controlling out year O&S costs of weapons systems during development and acquisi-

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[22] Gorn, 1989, p. 72.

[23] Gorn, 1989, p. 87.

[24] Gorn, 1989, p. 89.

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tion phases through attention to design procurement, and support planning."[25] This gave rise to high-level management interest in bringing considerations for logistics support into the conceptual and validating phases of weapon system acquisitions as a means of reducing support costs for future weapons. It also required close coordination and cooperation between Air Force Systems Command and AFLC.

In January 1974, AFLC, under the command of Gen F. Michael Rogers, established the Office of the Deputy Chief of Staff for Acquisition Logistics and three of its directorates—Aeronautical Logistics, Space Logistics, and Electronic Logistics—were located at Air Force Systems Command centers. General Rogers and the Air Staff felt that further improvement was needed, and, with approval from the Air Force secretary and chief of staff, a new organization, the Air Force Acquisition Logistics Division (AFALD), was created on July 1, 1976. It was placed under AFLC; however, it was a separate organization and its commander, Lt Gen Bryce Poe II, was not a member of the AFLC headquarters staff. The AFALD would deal directly with other organizations, both inside and outside of AFLC, on matters concerning acquisition programs.[26]

The mission of the AFALD was to provide a direct point of interface between AFLC and Air Force Systems Command. The division would ensure the effective integration of logistics support planning for acquisition programs and assist the program manager in maintaining a balanced life-cycle approach to systems development. In 1969, AFLC and Air Force Systems Command published a joint regulation calling for a weapon system program office to have a deputy program manager for logistics located in program offices and serving as the chief of an integrated logistics support division with a staff composed of a "blend of people from the Air Materiel Areas (AMAs) and product divisions." Last, the AFLC Deputy Chief of Staff for Acquisition Logistics was incorporated into the AFALD as well.[27]

A basic problem identified by General Rogers, that of PMRT, remained, and his successor, Gen Bryce Poe II, was just as concerned about it.[28] General Poe and Gen Alton D. Slay, commander of Air Force Systems Command, undertook a concerted effort to solve what they mutually agreed was "the problem of PMRT." The two commands began joint efforts that led to an agreement between the Aeronautical Systems Division and AFALD to try to expedite the transfer of programs. This agreement was seen as a potential model for transferring programs, and there is no doubt that it produced concrete results. After reviewing more than 140 systems under development at the Aeronautical Systems Division, they identified more than 60 for transfer within the subsequent three years. The review continued the following year and had an

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[25] Michael A. Yanke, *Air Force Acquisition Logistics Division: The New Kid on the Block*, Kirtland AFB, N.M.: Air Force Contract Management Division, November 1977, p. 4.

[26] Termena, Peiffer, and Carlin, 1983, p. 202.

[27] Yanke, 1977, p. 5.

[28] Carlin, 1992, p. 15.

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encouraging start, but it did not mark the end of complicated problems surrounding PMRT. General Poe felt that what did, in fact, determine PMRT dates was a series of joint reviews by the Air Force Systems Command and AFLC commanders to weigh the ever-changing circumstances of a program.

Although generally regarded by historians as effective in its early days, AFALD was not well received everywhere. Gorn's account reflects that Air Force Systems Command and product divisions felt that the Air Staff had established it as a "watchdog" to ensure that they built maintainability, availability, and supportability into weapon systems. Gorn states that AFALD proved to be an organizational irritant to Air Force Systems Command. "Not only did it recall to many individuals in the command the days when ARDC was tied to [Air Materiel Command], it also subjected the Product Divisions to the mandatory scrutiny of another command."[29]

Major Acquisition and Organizational Reform: 1985–June 30, 1992

By 1986, President Reagan's rearmament and associated large-scale expenditures, according to Carlin, strained defense acquisition processes, which, in turn, led to "horror stories" about ridiculously overpriced purchases and service acquisition staffs being portrayed as hopelessly naïve. For Air Force acquisition, the single most important examination was the "President's Blue Ribbon Commission on Defense Management," which became known unofficially as the "Packard Commission."

The commission called for the establishment of "unambiguous authority for acquisition policy, clear accountability for acquisition execution, and plain lines of command for those with program management responsibilities." The commission clarified that it meant to establish an Office of the Under Secretary of Defense for Acquisition and that each service would appoint a service acquisition executive. These executives would then appoint PEOs to manage a selected number of programs, with program managers reporting exclusively and directly to PEOs. The importance of the Packard Commission recommendations were not that they were acted upon immediately but that they pointed the way for later reform efforts.

In 1986, the year the Packard Commission convened, Congress passed the Goldwater-Nichols Department of Defense Reorganization Act (Pub. L. 99-433). The bill addressed many aspects of the military departments and was intended to strengthen civilian control over the military, especially in the field of acquisition. It was also to reduce the excessive layers of acquisition bureaucracy in the Pentagon and to eliminate the duplication of functions that existed at most service headquarters; for the Air Force, this referred to the duplication created by presence of a small civilian acquisition staff at the secretariat level and a large acquisition staff belonging to the Chief of Staff.

[29] Gorn, 1989, p. 115.

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Title V of the bill stipulated that the military departments consolidate all acquisition functions within each of their secretariats. All services complied with the requirements of the new law. The Air Force combined the chief's and secretary's staffs and placed the consolidated office under an "Assistant Secretary for Acquisition."

President George H. W. Bush, in National Security Review 11, issued in February 1989, instructed DoD to "develop a plan to accomplish full implementation of the Packard Commission . . . and to realize substantial improvements in defense management overall." Secretary of Defense Dick Cheney created a document titled "Defense Management Report to the President," dated July 1989, which followed the path of the Packard Commission. Secretary Cheney selected the Under Secretary of Defense for Acquisition; each service had a civilian SAE to provide overall direction for programs, including civilian control of the acquisition process. PEOs would manage major acquisitions, with program managers reporting to them.

Cheney also asked that the services scrutinize their existing acquisition and logistical organizations with an eye toward paring down, streamlining, and possibly merging commands. His intent was to "eliminate management layers and functions that didn't add value, consolidate functions where possible, and improve the efficiency of DoD's acquisition management, logistics, distribution, and related activities." Secretary of the Air Force Donald B. Rice offered his own strong endorsement of reform efforts. He stated that cuts were coming but that the real imperative was to delegate authority and responsibility to the most suitable level.

The Air Force had to examine merging Air Force Systems Command and AFLC into one large acquisition and logistics command. This examination was performed under the co-chairmanship of Deputy Chief of Staff for Logistics and Engineering Lt Gen Charles C. McDonald and Aeronautical Systems Division commander Lt Gen John M. Loh. Under one of two models studied, PEOs would be separate from product division commanders, would manage all major acquisition programs, and would require their own PEO staffs. The headquarters of the hypothetical command would provide administrative support and direct logistics operations. Commanders of the product divisions and the air logistics centers would be responsible for managing "non-major" programs, supporting PEOs and program managers, and conducting logistics operations.

The study group concluded that this model had several advantages: fully complying with the intent of acquisition reform, orienting the command toward life-cycle management and thereby eliminating the need for PMRT, and reducing the PEOs' span of control. In the group's opinion, it also had a few weaknesses: combining highly diverse functions into one organization, forming a huge and possibly unwieldy new command, and, at least potentially, either slighting science and technology or impairing logistical readiness for war. The commanders cautioned that such a merger could be difficult and destabilizing.

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In the fall of 1989, the comptroller from the Office of the Secretary of Defense began releasing a series of proposals called Defense Management Report Decisions (DMRDs) that called for major changes to the support functions of all military departments. For example, DMRD 943, in effect, became a charter for the eventual establishment of AFMC, although it did not call for the establishment of AFMC or any organization by another name. Rather, it proposed to "eliminate duplication and unnecessary management layers by disestablishing [Air Force Systems Command] and combining the remaining essential staff with the AFLC."

The intended action was more of an absorption by AFLC than a merger or integration of two commands. AFLC was taking over the remnants of Air Force Systems Command, its product divisions, research and testing facilities, and acquisition mission. The DMRD pointed out that AFLC was better organized to take on the Air Force Systems Command mission, that it had support machinery in place, and that it "had a structure to manage acquisition even though the focus has been primarily on ADP and other modernization/modification programs."

DMRD 943 had mainly addressed the virtues of economy and appeared to languish. Secretary Cheney, meanwhile, continued to reaffirm that "the services' systems and materiel commands will be reorganized with a primary focus on three roles: providing logistics support, managing programs that fall outside of the PEO structure, and [providing] a variety of services to the PEOs and [program managers]." In November 1990, leaders were informed about the impending creation of a new command, a decision by Secretary Donald Rice. The emphasis shifted from economies to efficiencies. Rice took pains to disabuse critics of the notion that it was a "takeover" or "absorption"; however, he called it a "double liquidation, with a new company being formed with the assets of the current commands."

Integration

Secretary Rice gave his decision to AFLC commander General McDonald, and Gen Ronald W. Yates, commander of Air Force Systems Command. The two leaders briefed Secretary Rice in December 1990. Their overall objective was threefold: to integrate the workforce and resources of the two commands, wisely capitalizing on the strengths of both; to improve existing business practices by providing a completely integrated weapon system management process throughout the weapon system's life cycle; and to provide a single face to operational commands that covered all aspects of integrated weapon systems management, establishing a clear line of responsibility. The new command also faced two main challenges: organizing a headquarters and finding a way to implement integrated weapon system management (IWSM).

Wright-Patterson AFB in Ohio, was selected as the headquarters over Andrews AFB in Maryland. The integration of the two commands was announced on January 3, 1991; extensive planning included various interim reports, and phased implementation began on October 1, 1991. The leaders of the two commands con-

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centrated on IWSM and believed that the success or failure of the command integration depended on making that concept work. What exactly was this concept that was deemed so critical?

In the early 1980s, AFLC focused on strengthening control of its weapon system managers and reorganizing its logistical functions on the basis of products served as opposed to services performed. Later, the AFLC commander, General Hansen, strived to remove seams and disconnects from logistical functions. He was the first to use the term *integrated weapon system management* and, in 1987, instructed his staff to look at the pros and cons of IWSM. It has been noted that General Hansen limited its use to strictly logistical matters, for internal reform within AFLC. However, in a few years, the term gained currency and its meaning expanded considerably. It became defined as "empowering a single manager with the authority over the widest range of weapon system program decisions and resources to satisfy customer requirements throughout the life of the weapon systems."

General Yates' new staff weighed the risk of the single-manager approach and concluded that "risk is driven by program office leadership, personnel, organization and communications. The single manager approach retains the same leaders and personnel with an approved organizational structure and communications." The single-manager approach raised the possibility of a single manager who was responsible for weapon systems from cradle to grave, presenting a single face to the user, eliminating PMRT and thereby achieving a seamless organization. This expanded definition is generally credited to Air Force Systems Command planners.

In the planning and preparation for startup, the first three months were spent developing the basic concept of IWSM. A roadmap was developed that was well received by the contemporaries. Prominent among its features was a section called "Constraints and Tenets," which set forth the basic principle and objectives of IWSM. One of the seven stated, "A single manager will be responsible for each selected program." Another proclaimed, "The organizational structure will be seamless. Seamless meant that management would not transfer between organizations." This definition has less clarity today but is often interpreted as "continuous" or "flowing."

Trying to select candidate programs on which to test the processes was another matter. The selection of weapons for testing IWSM raised the question of where the single manager would reside. The air logistics centers did not want to become merely repair depots through the transfer of management responsibility back to product divisions, and Air Force Systems Command leaders feared for the existence of product centers if program management automatically migrated when a system became operational. Motives included workload (jobs) and the integrity of the respective centers (air logistics centers) and product centers, with a fear that the latter would atrophy from lack of use. These arguments carried great weight with General Yates, and as he was preparing for another meeting with General McDonald, he began to consider changes to the direction in which IWSM was heading.

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The two commanders studied the points raised by the Air Force Systems Command field organizations and issued a memorandum of agreement with a revised roadmap. They decreed that under IWSM, the single manager would initially be placed at the product centers but would pay attention to the staffs of both product and logistics centers, moving from one to the other when a weapon system reached "maturity" (which they defined as a condition "where the predominant program activity is operational support, not acquisition"). They issued guidance on programs that had been partially or completely transferred. For those completely transferred, sole management would remain at the air logistics centers, and those that were partially transferred programs would be handled on a "case-by-case" basis.

Then at the end of 1991, the second edition of the IWSM roadmap was issued. It set forth the specific tasks necessary to complete process development on time for IWSM implementation by July 1, 1992. It also pinned down heretofore elusive terms. The system program office was now defined as the "integrated AFMC organization responsible for cradle to grave military system management." The system program director was the "individual in the AFMC [system program office] who is ultimately responsible and accountable for decisions and resources in overall program execution" and "the designated title for the single manager of a program who reports to a PEO or Designated Acquisition Commander (DAC)."

On June 11, 1992, as work progressed (with testing on selected weapons) and more clearly defined features were beginning to emerge (outgrowth of struggles with obstacles, like funding), Secretary Rice and Gen Merrill A. McPeak, the new Chief of Staff of the Air Force, issued a joint policy letter reaffirming IWSM and delineating their views on the roles of product and logistics centers.

This pronouncement left many senior leaders uneasy because the product center management roles were certain, but the management position of the logistics centers was not as clearly stated and raised the possibility that they might not have such a role. To make it a bit more uncertain, the AFLC commander General Searock, Lt Gen John Janquish from the Office of the Assistant Secretary of the Air Force for Acquisition, Deputy Chief of Staff for Logistics Lt Gen Trevor Hammond, and all nine product and logistics center commanders agreed that more guidance was needed to clarify this matter.

Establishing the New Command: July 1, 1992–September 30, 1996

On July 1, 1992, when the Air Force Materiel Command was established, General Yates took command of AFMC and quickly issued a policy letter on management roles of the product and logistics centers. First, he made it clear that both product and logistics centers would conduct weapon system management:

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> The key factor that dictates management at a product center is significant development or integration risks. When such risks have subsided and the major risk is assuring the operational availability of fielded systems a logistics center is the focus for product management.

He applied the same test to moving the management of individual products (commodities). He concluded, "I expect our IWSM Program Directors to take a corporate level view of overall product management tasks and to recommend their location." General Yates felt that his predecessor, General Schriever, had brought together the functions of R&D, testing, and acquisition. The next step was to bring logistics into the fold.

As commander, General Yates introduced a concept called the Command Management Framework, which focused on mission elements instead of the traditional two-letter organizational approach to management. Then, as an integral part of AFMC, logistics, was renamed *sustainment* and became one of the five AFMC mission areas. Organizing AFMC into five distinct elements was thought to be a practical way to cope with the diverse functions of two different commands that were now combined into one. Another school of thought held that there was an implicit contradiction between focusing on discrete mission elements, on the one hand, and the tenets of IWSM on the other.[30]

Gen Henry Viccellio, Jr., assumed command of AFMC in June 1995. In November 1995, the Under Secretary of Defense for Acquisition and Technology, Paul Kaminski affirmed a Defense Acquisition Board decision to enter full-rate production for a total of 120 C-17s. On April 17, 1995, Air Force Acquisition Executive (AFAE) Clark G. Feister was killed in an aircraft mishap. Feister's duties were assumed on an interim basis by his deputy, Darleen A. Druyun, who soon played a significant role in the renewed clamor for acquisition reform because of her role in the new Air Force tanker acquisition. President Clinton subsequently nominated Arthur L. Money to be the next Air Force Acquisition Executive.[31]

In its long-term, continuing effort to plan for and deal with the effects of the 1993 and 1995 Base Realignment and Closure Commissions, AFMC concluded the closure of Newark AFB and the privatization of the Aerospace Guidance and Metrology Center. Command planners turned their attention to privatization of the San Antonio Air Logistics Center (SA-ALC) and Sacramento Air Logistics Center (SM-ALC). Planners also began to examine the possibility of creating a new laboratory structure that combined the four existing laboratories, the headquarters science and technology

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[30] Carlin, 1992 p. 15-84. This concludes our summary of Carlin's *Building a New Foundation* study.

[31] Jean August, H. P. Carlin, William Elliott, Kathi R.Jones, Carol H. Parks, Layne B. Peiffer, William W. Suit, and John D. Weber, *History of the Air Force Materiel Command, 1 Oct 1993–30 Sep 1994*, Wright-Patterson AFB, Ohio: History Office, April 1995, pp. 51–52.

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staff, and the Office of Scientific Research into one laboratory. The concept received approval by the Air Force Secretary and the Chief of Staff of the Air Force.[32]

Arthur L. Money, who had been approved as the Air Force Acquisition Executive, also served as Assistant Secretary of the Air Force for Acquisition (SAF/AQ). He was assisted by two principle deputies, Druyun and Lt Gen George K. Muellner. By February 1996, SAF/AQ had completed a significant reorganization of the Air Force PEO system, whereby the PEOs increased in number and were modified to align with new mission area directorates, which, in turn, mirrored the recently reorganized Air Force Board structure.

Running AFMC as a Business: October 1, 1996–September 30, 2000

In May 1997, General Viccellio retired; Lt Gen Kenneth E. Eickmann served as acting commander from May 9 to 29, 1997, and Gen George T. Babbitt did so thereafter. One of General Babbitt's notable initiatives at AFMC emphasized learning not simply how well a given mission was performed but also what its actual costs were. He introduced the command to the practices and terminology of the corporate business world, with the goal for AFMC to be run like a business.[33]

The years of 1996 and 1997 were a seminal period in the development of U.S. military doctrine and Air Force doctrine in particular, with the publication of *Joint Vision 2010*, a Joint Chiefs of Staff publication that spoke of dominating an enemy with a range of military capabilities. The Air Force followed suit with a publication called *Global Engagement: A Vision for the 21st Century Air Force*, which discussed the core competencies unique to air warfare. One of the six was agile combat support (ACS) and how the Air Force deploys and sustains forward-deployed forces. One of the hallmarks of ACS was an ability to *reach back* to resources in the United States instead of building up massive inventories for developing responsive supply capabilities. General Babbitt was one of the major proponents of ACS and was convinced that improvements in information, C2, and transportation would "ensure a reachback capability that gets the right part or service to the right place at the right time."[34]

The first phase of the establishment of the Air Force Research Laboratory (AFRL) was successfully carried out in FY 1997, laying the groundwork for the second and final phase. The four laboratories continued to exist as named units during this phase and

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[32] Jean August, H. P. Carlin, William Elliott, Kathi R.Jones, Carol H. Parks, Layne B. Peiffer, William W. Suit, and John D. Weber, *History of the Air Force Materiel Command, 1 Oct 1995–30 Sep 1996*, Wright-Patterson AFB, Ohio: Air Force Materiel Command, History Office, April 1996, pp. xxii–xxiii.

[33] Jean August, H. P. Carlin, William Elliott, Dennis C. Mills, Layne B. Peiffer, and William W. Suit, *History of the Air Force Materiel Command, 1 Oct 1996–30 Sep 1997*, Wright-Patterson AFB, Ohio: Air Force Materiel Command, History Office, April 1998, p. 5.

[34] August et al., 1998, p. 9.

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still functioned as separate entities, but their commanders reported to a new AFRL commander. Furthermore, the four laboratories were pulled out of the command's product centers, and almost all manpower was removed from the product centers' UMDs and consolidated into a single AFRL UMD."[35]

Centers of Excellence

In 1998, a group of senior AFMC leaders examined the roles, responsibilities, and relationships within the organizational structure of the command, which led to the development of a new centers of excellence (COE) concept. The plan, briefly discussed here, was later abandoned because the implications of the proposal soon proved politically infeasible.[36]

The centers under this proposal were designated in the following areas: aeronautical; space and missile; command, control and information; and air armament. These product COEs were to be responsible for product life-cycle support, with AFRL, test, and logistics centers being the suppliers of technology, performance verification, and industrial support. Under this concept, the air logistics centers were to be primary suppliers of goods and services to COEs and would operate as business units focused on supply chain management, depot maintenance and repair, and combat logistics support. One of the AFMC business executives said in an interview that its intent was to have a single program manager over the life cycle of the weapon system and to progressively become the sole domain of the product centers. He believed that its demise was governed by the fact that "the COE concept (was viewed) as an assault on program management activities at the Air Logistics Centers, which quite logically and rightly would be of great interest to most [congressional] constituents."[37]

In an interview, AFMC Vice Commander Lt Gen Stewart E. Cranston described how the air logistics centers saw it as a threat, "a direct attack on their engineering capability and responsibilities. They saw it as a major step towards reducing them to a blue collar industrial activity." Essentially, it became politically untenable. He believed that the idea for the COEs "emerged at the headquarters as being a logical extension of what we were trying to do to rationalize the business relationships that we had across our centers."[38]

Finally, during another interview, AFMC Commander, General Babbitt, stated that he viewed the COEs as "[following] quite naturally from the idea of looking at the product support business area and dividing up what we do there into its logical pieces." He suggested that AFMC had "different industries that support product centers. . .

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[35] August et al., 1998, p. 25.

[36] H. P. Carlin, *Roles and Responsibilities: Readings in the Heritage of the Air Force Materiel Command*, Wright-Patterson AFB, Ohio: Air Force Materiel Command, History Office, August 2001, p. 53.

[37] Carlin, 2001, pp. 72–74 (interview with Alan B. Goldstayn).

[38] Carlin, 2001, p. 78.

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with people who grow up with skills in contracting and financial management and engineering and program management that focus on different kinds of weapon systems (aeronautical, space-based, etc.). I think that's really what a COE is." He believed also that the COEs became "known as a way to say—in code— [that] all product management is done at the product centers, and it never transitions to the logistics centers." He wanted it left open that a fielded weapon systems might be managed out of an air logistics center.[39]

Continuing Acquisition Reform

There were sufficient achievements from the 11 original Lightning Bolt initiatives to "jump-start the acquisition process" announced by Druyun in 1995. On April 23, 1999, she launched "Lightning Bolts '99." This involved seven new high-profile initiatives to "set the stage for greater efficiencies and costs savings in the way we acquire and sustain systems and services for our warfighters."[40]

For three consecutive years, DoD acquisition officials had declared time periods dedicated to acquisition reform. These were traditional military "stand-downs" and usually involved the day-long suspension of normal activity so that attention could be paid to a particularly important issue (such as aircraft safety). For 1999, the event's scope was expanded to include the sustainment community, giving rise to the designation Acquisition and Logistics Reform Week. Air Force officials generally applauded the proclamation, recognizing acquisition and logistics as essentially "interconnected."[41] The three most urgent priorities identified by Jacques S. Gansler, Under Secretary of Defense for Acquisition, Technology, and Logistics, were as follows: continuing recognition "that what we're doing is for the Warfighter"; a persistent need "to accelerate, broaden, and institutionalize our acquisition and logistics reform efforts . . . to optimize limited resources"; and a focus on "modernization of our logistics system itself."[42]

Further Evolution and Persistent Challenges

When a B-1B bomber crashed near Mattoon, Kentucky, on February 8, 1998, the resulting investigation found the basic cause to be a short in a fire warning extinguisher panel circuit board. This hidden defect in a single Air Force bomber led to scrutiny of a similarly obscure disconnect in the Air Force system of acquisition and sustainment and "all too forcefully underscored the point that fixing roles and responsibilities and resolving the dichotomy of acquisition and support was no mere theoretical matter,

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[39] Carlin, 2001, p. 88.

[40] Jean August, H. P. Carlin, William Elliott, Dennis C. Mills, Layne B. Peiffer, and William W. Suit, *History of the Air Force Materiel Command, 1 Oct 1998–30 Sep 1999*, Wright-Patterson AFB, Ohio: Air Force Materiel Command, History Office, April 2000, p. 66.

[41] August et al., 2000, p. 67.

[42] August et al., 2000, p. 68.

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but rather one that directly impinged on the effectiveness and well-being of combat forces."[43] A period of investigation and correspondence ensued between General Babbitt and Druyun and, later, the new SAF/AQ, Lawrence J. Delaney. General Babbitt developed the command's approach to supporting fielded systems, which was basically that, following initial operational capability, sustainment responsibilities were to be carried out by the single manager reporting to the AFMC commander, an approach that was never really adopted in full nor agreed to by all stakeholders.

The Turbulent Decade: 2000–2010

The September 11, 2011, terrorist attacks on New York City and Washington, D.C., and the global response directed by a new president would shape the commitments and future actions of the military services and introduce resource levels the services had not envisioned. For the acquisition and sustainment community, the decade would have three top priorities. The first would be replacing "legacy," or aging, systems, which represented one of the most serious issues facing the Air Force. The average age of the operational aircraft fleet reached 23.99 years by FY 2010.[44] The other priorities were ongoing support of overseas contingencies and sustainment of the precious resources available to the Air Force for mission accomplishment. Acquisition and sustainment, the latter in terms of achieving desired OSS&E levels, remained areas of utmost importance.

Gen Lester L. Lyles assumed command of AFMC on April 20, 2000. On August 1, AFMC's Product Support Executive Board presented and agreed to new "command milestones" for operational safety, suitability, and effectiveness (OSS&E) maturity levels, with full compliance (Level 6) required by the end of FY 2005. The agenda to institutionalize OSS&E and achieve full compliance throughout the Air Force was promulgated by the efforts of General Lyles and Lt Gen Michael Zettler, Deputy Chief of Staff for Installations and Logistics, in a joint memorandum to the Air Force MAJCOMs requiring them to "compile and furnish a list of directly acquired systems and end-items, and identify your responsible OSS&E organization to AF/ILM [director of maintenance] not later than Dec 15, 2000."[45]

The acquisition reform and Acquisition and Logistics Reform Week were dramatically put to a halt by the terrorist attacks of September 11. Subsequently, Druyun urged that all acquisition specialists transition to a wartime posture to support Opera-

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[43] Carlin, 2001, p. 57.

[44] Gen Norton A. Schwartz, Chief of Staff, U.S. Air Force, "CSAF Vector 2010," memorandum, July 4, 2010, p. 2.

[45] Schwartz, 2010, p. 83.

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tion Enduring Freedom. She also formulated a third series of Lightning Bolt initiatives designed specifically to respond to warfighter needs.[46]

The new President, George W. Bush, had his closest advisers on defense requirements and acquisition policy: Vice President Dick Cheney and Secretary of Defense Donald H. Rumsfeld. Both Cheney and Rumsfeld believed in the primacy of a strong national defense. Both were also firm believers in limiting federal spending, and that combination naturally inclined them to support the "pragmatist" transformation argument.[47] The broad transformation directives of Secretary of the Air Force James G. Roche and Air Force Chief of Staff Gen John P. Jumper are not the focus of this historical summary, but the goal of achieving a 75-percent compression in acquisition cycle times warrants mention. General Lyles said, "There is no way the Air Force can successfully transform without considering the technology, acquisition, and sustainment support that we provide."[48]

Agile Acquisition

In 1969, the time required to move a major Air Force program from startup to initial operational capability averaged about 55 months. In 1986, when the Packard Commission identified excessively long cycles as a central problem, that figure was just over 100 months. Eleven years later, despite multiple attempts to improve this time, it remained essentially the same, averaging just under 100 months.[49] In January 2002, General Lyles and the Assistant Secretary of the Air Force for Acquisition, Marvin Sambur, presented the briefing "Agile Acquisition and Sustainment Transformation" to General Jumper and Secretary Roche. One task was to correlate technology, technology transition, and concept development with Jumper's "capabilities task forces." The second was to create collaborative spiral requirements and program management processes, using a small group of promising programs, or "pathfinders," to test the practicability of the approach at the earliest opportunity. The third was to replace development testing and operational testing with a single, integrated performance verification process. Lyles and Sambur attempted to institutionalize funding stability and continue sustainment transformation. Jumper and Roche fully supported the AFMC initiative.[50]

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[46] H. P. Carlin, William Elliott, Paul Ferguson, Layne B. Peiffer, and William W. Suit, *History of the Air Force Materiel Command, 1 Oct 2000–30 Sep 2001*, Wright-Patterson AFB, Ohio: Air Force Materiel Command, History Office, April 2002, p. xix.

[47] H. P. Carlin, William Elliott, Paul Ferguson, Layne B. Peiffer, and William W. Suit, *History of the Air Force Materiel Command, 1 Oct 2001–30 Sep 2002*, Wright-Patterson AFB, Ohio: Air Force Materiel Command, History Office, April 2003, p. 94.

[48] Carlin, Elliott, Ferguson, et al., 2003, p. 104.

[49] Carlin, Elliott, Ferguson, et al., 2003, p. 108.

[50] Carlin, Elliott, Ferguson, et al., 2003, p. 109.

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General Lyles later underscored his support for these efforts, writing about how important agile acquisition was to the command's future. Lyles and Sambur also signed a concept of operations (CONOPS) that defined agile acquisition as "speed and credibility." It established the Office of the Assistant Secretary of the Air Force for Acquisition (SAF/AQ, then led by Secretary Sambur) as the supported command charged with execution, with AFMC as the supporting command that would train, organize, and equip the acquisition workforce. "As such, the expectation is that the AFMC extended staff will operate with appropriate speed necessary to support SAF/AQ requirements. In turn, SAF/AQ will keep AFMC informed so they are responsive to SAF/AQ requirements."[51]

This determination to raise customer confidence became even more pointed in a follow-up policy letter sent to the entire acquisition community in late April 2003. It established that "surprises hurt our credibility with our leadership, OSD, and the Warfighter. . . . Programs should not be built on hopes and promises." To correct the apparent failure in what Sambur had called "expectation management," future program management directives would include a new means of documenting arrangements between the warfighters and the developers regarding anticipated costs, schedules, and performance.[52]

Air Force Program Executive Officer Realignment

In the second half of 2002, General Lyles (SAF/AQ), Secretary Sambur, and other senior Air Force officials evaluated various proposals to make Headquarters AFMC more effective, including a staff reorganization that would have created two new three-star general officer positions: one for an "acquisition commander" and the other for a "sustainment commander." This concept was eventually rejected, but it did give impetus to a subsequent reconsideration of the C2 relationship between SAF/AQ and Headquarters AFMC.[53]

The result was a proposal to realign the non-space PEOs' assignment location; the realignment's intent was that, with exceptions (for example, Joint Strike Fighter, F-22, and the services), the PEOs would be given redistributed "enterprise-centric" portfolios and relocated from Washington, D.C., to their portfolio-related AFMC product centers. This move would encourage them to focus more closely on the goal of enterprise-based horizontal integration across present and future weapon systems.[54]

On July 23, 2003, General Jumper and Secretary Roche formally authorized the PEO realignment. It reorganized three of the six portfolios in parallel to AFMC's three

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[51] Lester L. Lyles, and Marvin R. Sambur, *Agile Acquisition: Concept of Operations Between SAF/AQ and HQ AFMC*, January 2003, p. 1.

[52] Carlin, Elliott, Ferguson, et al., 2003, p. 101.

[53] Carlin, Elliott, Ferguson, et al., 2003.

[54] Carlin, Elliott, Ferguson, et al., 2003, p. 123.

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product lines. Since the bearers of these new portfolios (aircraft, C2 and combat support, and weapons) were also AFMC product division commands (the Aeronautical Systems Center, Electronic Systems Center, and Air Armament Center, respectively), this had the desired effect of embedding the PEOs in the heart of the enterprise leadership construct. The portfolios would gain from the former DACs additional programs as well, and, to offset this extra burden, each PEO was assigned a deputy PEO. No deadline was set for implementing the new arrangement, but SAF/AQ and the AFMC commander were required to "jointly take the lead to implement this construct, defining the details and ensuring a smooth transition."[55] When Gen Gregory S. Martin assumed command of AFMC on August 22, 2003, it fell to him to execute the PEO/DAC changes.[56]

In December 2003, the Air Force approved and implemented the Agile Acquisition CONOPS. AFMC representatives contributed to acquisition reform development by participating in the Acquisition Transformation Action Council and its subordinate Transformation Action Group. General Martin was concerned about AFMC's credibility with Congress, OSD, the Office of the Secretary of the Air Force, and its operational customers because acquisition programs too often came in late and over budget. He directed the establishment of an attrition-based planning integrated product team (IPT) in October 2003.[57] The team determined that the cost-growth problem was driven by budget reductions or requirements changes and thus focused on ways in which AFMC could better manage the "known unknowns" associated with program management.[58]

In his 2004 commander's call, General Martin stated that he expected the mission statement of the headquarters to differ from that of the command as a whole, since the headquarters performed a specific function within the command but would not duplicate the efforts of the entire command. The plan that emerged focused on the three major tasks identified in the mission statement: to *develop, field, and sustain* war-winning expeditionary capabilities. The reorganization of functions along these lines aligned one mission directorate with each of the command's three primary missions, including a deputy for acquisition and a deputy for support in the product centers. In recognition of the increased responsibilities that the product center commanders

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55 Carlin, Elliott, Ferguson, et al., 2003.

56 Gail Kaufmann, "Interview with General Gregory Martin, USAF," *Defense News*, September 15, 2003, p. 78.

57 Attrition-based planning is the study of previous or similar product development programs to help in developing new programs' schedules and costs.

58 James R. Ciborski, Paul Ferguson, Layne B. Pfeiffer, William W. Suit, and Lori S. Tagg, *History of the Air Force Materiel Command, 1 Oct 2003–30 Sep 2004*, Wright-Patterson AFB, Ohio: Air Force Materiel Command, History Office, April 2005, p. xxvii.

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received when they assumed the role of PEOs, these new positions replaced the existing vice commander and executive director positions at the centers.[59]

Other factors affecting AFMC and the acquisition community included manpower reductions and the need to support global commitments by expanding the pool of deployable airmen available for each of the aerospace expeditionary forces. The community anticipated a future with fewer fighters and strike aircraft and a new budget process for DoD. That process involved changing from an annual program objective memorandum and budget estimate submission to a two-year cycle beginning with an amended cycle for FY 2005.

Sustainment Impact of the Realignment

Throughout FY 2004, Sambur conducted a series of town hall meetings at many of the bases affected by the PEO realignment to educate personnel about the changes. The realignment operated with several overarching goals, including focused roles for execution of acquisition (PEOs) and execution of sustainment (air logistics center commanders). A new product support working group, led by the Deputy Chief of Staff for Installations and Logistics (AF/IL) and including members from AFMC/DR, AFMC/LG, and AFMC/XP, was responsible for preparing specific definitions for the acquisition and sustainment phases and for developing a *portfolio transfer process*. The process was intended "to determine when a program should move from the Acquisition Portfolio to the Sustainment Portfolio."[60]

The program manager was the *supported commander* (the single point of accountability for the weapon system throughout its life cycle). The development system manager and the sustainment system manager were the *supporting commanders* (responsible for working on development and sustainment issues with the customer and industry). With customer support as the primary focus of the realignment initiative, acquisition officials wanted to eliminate the possibility of assigning confusing terminology to any aspect of the life cycle. As phase 2 planning progressed, the IPT attempted to resolve these existing terminology issues.[61]

Later in September, the IPT prepared a staff package for submission to General Martin and Secretary Sambur, requesting formal approval of the phase 2 process. The document declared phase 2 ready for execution "to align program responsibility for mature weapon systems to [the air logistics centers]." It also identified the sustainment transfer point (normally, when a program nears completion of the production and deployment phases) and directed an annual review of the transfer status of all weapon systems within a PEO's portfolio. The package also identified each of the 50 programs

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[59] Ciborski, Ferguson, et al., 2005, p. 76.

[60] Ciborski, Ferguson, et al., 2005, p. 102.

[61] Ciborski, Ferguson, et al., 2005, p. 105.

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deemed ready for transfer from acquisition to sustainment. General Martin signed the package and forwarded it for Sambur's approval in late September 2004.[62]

Sustainment had once again ceased to be an issue through a series of agreements reached collaboratively, as it had been in the past. It would seem that any divisions between acquisition and sustainment had been at least temporarily breached and, perhaps, the basis for continuing agreement had been set.

Mid-Decade Changes

AFMC experienced a complete change in its senior leadership in the final quarter of FY 2005. Gen Bruce Carlson assumed command of AFMC on August 19, 2005, succeeding General Martin. AFMC Vice Commander, Lt Gen Richard V. Reynolds, retired from service on June 30, 2005, and was succeeded in August by Lt Gen Terry L. Gabreski, previously the commander of the OC-ALC. Robert J. Conner, the executive director of AFMC and a member of the Senior Executive Service, became the first civilian to serve as director of OC-ALC, succeeding General Gabreski as the center's senior leader.[63] At the Air Force level, Gen T. Michael Moseley replaced Gen John Jumper as Chief of Staff of the Air Force.

In the sustainment arena, the Air Force initiated Expeditionary Logistics for the 21st Century (eLog21) in February 2003, and many of AFMC's sustainment transformation efforts were directly linked to this overarching initiative (discussed later). The product support campaign reinvigorated the process of integrating support planning into the development, fielding, sustainment, and retirement of all systems. Depot maintenance transformation applied the latest technology, business management, and industrial management innovations to depot operations to improve maintenance, repair, and overhaul. It included five top initiatives: material supply support, depot maintenance workforce development, standard depot maintenance process, standard approach to continuous improvement, and change management.[64]

On March 28, 2005, DoD announced that all major programs managed by the Air Force (and designated acquisition category [ACAT] 1C programs) would be temporarily placed under the authority of Michael Wynne, who was then active Under Secretary of Defense for Acquisition, Technology, and Logistics. This affected 21 programs that reverted from ACAT 1C to ACAT 1D, with Wynne holding milestone decision authority. In this environment of acquisition scrutiny and transformation,

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[62] Ciborski, Ferguson, et al., 2005, p. 108.

[63] James R. Ciborski, Edward J. Coss, Paul Ferguson, Thomas W. Mason, Layne B. Pfeiffer, William W. Suit, Lori S. Tagg, and Robert L. Young, *History of the Air Force Materiel Command, 1 Oct 2004–30 Sep 2005*, Wright-Patterson AFB, Ohio: Air Force Materiel Command, History Office, April 2006, p. xxi.

[64] Ciborski, Coss, et al., 2006, p. xxvii.

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AFMC continued to develop, field, and sustain systems and capabilities through one of the most turbulent periods of its existence.[65]

Renewed Acquisition Reform

For many years, DoD made various attempts to improve the acquisition system, but the perception remained that all reform actions thus far had failed to correct existing systemic weaknesses. Consequently, on June 7, 2005, Gordon England, acting Deputy Secretary of Defense, issued the following mandate:

> There is a growing and deep concern within the Congress and within the Department of Defense Leadership about the DoD acquisition processes. Many programs continue to increase in cost and schedule even after multiple studies and recommendations that span the past 15 years. . . . I am authorizing an integrated acquisition assessment to consider every aspect of acquisition, including requirements, organization, legal foundations. . . . every aspect. . . . The output of this effort. . . . will be a recommended acquisition structure and processes with clear alignment of responsibility, authority and accountability. Simplicity is desirable.[66]

Chaired by Lt Gen (ret.) Ronald T. Kadish, the Defense Acquisition Performance Assessment Program panel reviewed documentation, held open meetings, maintained a public input website, heard briefings, and surveyed government and industry acquisition professionals. AFMC provided representatives to the panel, and the review progressed throughout 2005. The panel issued its report in late 2005; however, the results and the implementation of the findings are outside the scope of this summary.[67]

Operational Safety, Suitability, and Effectiveness Management

In 2005, there were several safety-related incidents at WR-ALC, and Headquarters AFMC teams found that OSS&E policy had not been implemented in the product centers and air logistics centers, that training was ineffective, that policy and processes were not well understood, and that organizational relationships and required documentation to support OSS&E were not clearly defined. At a time of increased acquisition scrutiny and growing demands for increased system support to the warfighter, OSS&E assumed greater importance. AFMC commander General Martin acknowledged it as "essentially our overarching Command systems integrity program and a core element of AFMC systems engineering.[68]

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[65] Ciborski, Coss, et al., 2006, p. 140.

[66] Ciborski, Coss, et al., 2006, p. 155.

[67] Ciborski, Coss, et al., 2006, p. 155.

[68] Ciborski, Coss, et al., 2006, p. 157.

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DoD Senior Leadership Changes

On November 3, 2005, Michael W. Wynne was confirmed as Secretary of the Air Force, ending a transitional period during which three acting secretaries held office after the retirement of James Roche in January of that year.[69] In August 2006, the Air Force announced that Sue C. Payton had assumed duties as the service's new SAE. Lt Gen Donald J. Hoffman continued serving as military deputy in SAF/AQ. Robert M. Gates accepted the nomination for Secretary of Defense on November 8, 2006, replacing Donald Rumsfeld. Wynne appointed Kenneth E. Miller as his special assistant for acquisition governance and transparency. Miller was charged with developing policies to improve governance oversight and enforcement of the acquisition process.[70]

Air Force Smart Operations for the 21st Century and Develop and Sustain Warfighting Systems

The DoD acquisition community continued to face congressional and public scrutiny because of frequent cost overruns and delays in many systems under development. In response to this criticism and to make all the service's processes more efficient, Secretary Wynne implemented the Air Force Smart Operations for the 21st Century (AFSO21) program. General Carlson endorsed AFSO21 as making AFMC more efficient through continuous process improvement. The command's transformation efforts included continuing the agile acquisition initiative and the Develop and Sustain Warfighting Systems (D&SWS) program. The latter effort was a response to the continuous exploration of the feasibility of merging certain aspects of the acquisition and sustainment processes. General Carlson and General Hoffman were designated as co-leads.[71]

General Carlson assigned Brig Gen Janet C. Wolfenbarger, special assistant for command transformation to the commander of AFMC, to manage the D&SWS effort as chief process owner. General Wolfenbarger briefed the AFMC Council about D&SWS, defining the subprocesses involved and describing their expected outcomes. The D&SWS process was designed as a single authoritative strategic map supporting the weapon system—beginning with capability planning and requirements and ending with the ultimate disposal of the system at life-cycle end.[72]

Activation of the Air Force Global Logistics Support Center

With the activation of the Air Force Global Logistics Support Center (AFGLSC), headquartered at Scott AFB, Illinois, on March 28, 2008, AFMC added another

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[69] James R. Ciborski, Paul Ferguson, Thomas W. Mason, Layne B. Pfeiffer, and William W. Suit, *History of the Air Force Materiel Command, 1 Oct 2005–30 Sep 2006*, Wright-Patterson AFB, Ohio: Air Force Materiel Command History Office, May 2007, p. 84.

[70] Ciborski, Ferguson, Mason, et al., 2007, p. 87.

[71] Ciborski, Ferguson, Mason, et al., 2007, p. 99.

[72] Ciborski, Ferguson, Mason, et al., 2007, p. 100.

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center to its list of primary subordinate units. This action marked the completion of another major step in the effort that started two years earlier: restructuring the command's supply chain management functions. AFMC commander General Carlson had approved Scott AFB as the location for the permanent center headquarters in August 2007 based on a recommendation from the Global Logistics Support Center (Provisional) commander. Although the organization was activated with the designation "Global Logistics Support Center (Provisional)," the Air Staff subsequently directed that the permanent center have the words "Air Force" in its designation.[73]

The creation of the AFGLSC not only involved a realignment of functions and personnel from AFMC's existing air logistics centers, but it also entailed the realignment of two Air Combat Command and Air Mobility Command organizations into AFGLSC: the Combat Air Forces Logistics Support Center at Langley AFB, Virginia, and the Mobility Air Forces Logistics Support Center at Scott AFB, Illinois, respectively. It was expected that both the air logistics centers and the AFGLSC would undergo further restructuring in future years to move more supply chain management functions from the air logistics centers into the AFGLSC.[74]

Expeditionary Logistics for the 21st Century Initiatives

The Air Force Deputy Chief of Staff for Installations and Logistics introduced eLog21 to the senior Air Force leaders at the February 2003 Corona Air Force Conference. The Air Force–level initiative was led by the Directorate of Transformation in the office of the Deputy Chief of Staff, Installations, Logistics, and Mission Support.[75]

Each Air Force MAJCOM had a logistics component, so all contributed to eLog21. AFMC, as the logistics support command, played a dominant role in numerous logistics improvement initiatives under the umbrella of sustainment transformation. The primary initiatives were the AFGLSC and the Expeditionary Combat Support Systems (ECSS) information technology procurement effort, along with the creation of Air Force Fuels, Vehicles, and Support Agency (AFFVESA); the Aircraft Availability Improvement Program; Asset Marking and Tracking; Logistics Installation Mission Support–Enterprise View; Product Life-Cycle Management, the Production Support Business Process (and, later, High Velocity Maintenance); Centralized Asset Management; Global Ammunition Control Point; System Life Cycle Integrity Management; and Repair Network Integration Transformation.[76]

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[73] Jennifer Blankenship, James R. Ciborski, William Elliott, Paul Ferguson, Thomas W. Mason, and William W. Suit, *History of the Air Force Materiel Command, 1 Oct 2007–30 Sep 2008*, Wright-Patterson AFB, Ohio: Air Force Materiel Command, History Office, April 2009, p. 34.

[74] Blankenship, Ciborski, Elliott, et al., 2009, p. 36.

[75] Blankenship, Ciborski, Elliott, et al., 2009, p. 212.

[76] Blankenship, Ciborski, Elliott, et al., 2009, p. 212.

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AFMC Senior Leadership and Organizational Changes

Gen Donald J. Hoffman succeeded Gen Bruce Carlson as AFMC commander on November 21, 2008. Lt Gen Terry L. Gabreski and Steven Butler continued on as Vice Commander and Executive Director, respectively. AFMC's mission remained unchanged, and the new commander identified four major focus areas: Revitalize the AFMC nuclear enterprise, normalize continuous process improvement, reinvigorate the acquisition workforce, and standardize and simplify AFMC processes in research, acquisition, test and sustainment.[77]

Under the tenets of AFSO21—the model for continuous process improvement—and one of its core processes, D&SWS, AFMC (with General Hoffman as co-lead) assisted in reviewing and revising several important policy documents, including AFI 63-101, *Acquisition and Sustainment Life Cycle Management*, and U.S. Department of Defense Instruction 5000.02, *Operation of the Defense Acquisition System*. In its fourth year of D&SWS planning and development, AFMC continued to build on improvements made to the acquisition process, including an increased role for the AFMC four-star general, new designated acquisition officials, program manager tenure requirements, and the creation of the Integrated Life-Cycle Management (ILCM) Executive Forum. Subprocess teams continued to develop and implement initiatives fostering continuous process improvement, including new publications and support for the development of emerging "Pathfinder" programs.[78]

Integrated Life-Cycle Management and Acquisition Improvement Efforts

We mentioned ILCM with regard to the establishment of the ILCM Executive Forum in FY 2007. The forum was originally chaired by the SAE, with the AFMC commander serving as a principal participant. Later, the standing members received briefings addressing significant program issues and a few informational topics that were central to One Materiel Enterprise. The ILCM Executive Forum then rendered formal decisions and assigned program-specific action items. This effort focused on ILCM enterprise policy evolution, executed in two phases, or "spirals."[79]

Spiral 1 covered weapon system front-end policy and addressed the principal Headquarters Air Force ILCM publications, including Air Force Instruction 63-101, *Acquisition and Sustainment Life Cycle Management*; Air Force Policy Directive 63-1/20-1, *Acquisition and Sustainment Life-Cycle Management*; and Air Force Pamphlet 63-128, *Guide to Acquisition and Sustainment Life Cycle Management*. Work also began on Spiral 2, weapon systems operations and deployment, with expected revisions

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[77] Jennifer Blankenship, James R. Ciborski, Paul Ferguson, Thomas W. Mason, and William W. Suit, *History of the Air Force Materiel Command, 1 Oct 2008–30 Sep 2009*, Wight-Patterson AFB, Ohio: Air Force Materiel Command, History Office, April 2010b, p. xxxv.

[78] Blankenship, Ciborski, Ferguson, et al., 2010b, p. xli.

[79] Blankenship, Ciborski, Ferguson, et al., 2010b, p. 96.

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to Air Force Instructions 63-101 and 20-101, *Sustainment Guidance for ILCM*. Spiral 2 policy development ran though FY 2010.[80]

SAF/AQ decided to reorganize its Acquisition Center of Excellence (ACE). The ACE had been established in 2001, and AFMC and AFSPC later developed comparable organizations. The ACEs primarily provided pre-award program support. On April 7, 2009, the SAF/ACE officially became the Air Force Center for Program Management and Acquisition Excellence. Headquarters AFMC participated in the working groups that were established to develop plans for the center's expanded mission.[81]

Acquisition Improvement Program

Shortly before implementing the Air Force's Acquisition Improvement Program (AIP), Secretary of the Air Force Michael B. Donley issued a guidance memorandum expanding the responsibilities of the SAE and the AFMC commander as defined in Air Force Instruction 10-601, *Capabilities Based Requirements Development*. Donley established a requirement for these key acquisition officials to certify capability development documents for major programs to improve the likelihood of a successful contract award in the source-selection process. The second AIP initiative essentially expanded on this memorandum by directing the development of effective acquisition strategies, including a requirement for the SAE and the AFSPC commander to certify capability development documents for major programs.[82]

AFMC's senior leadership actually began endorsing capability development documents and capability production documents in November 2007 in conjunction with the ongoing effort to expand the AFMC commander's involvement in the acquisition process. During FY 2009, planning progressed on the second AIP initiative, with many actions undertaken or scheduled to begin early in FY 2010. These activities included the revision of applicable Air Force instructions, personnel training, tracking the initiative's progress through metrics, and an inspection process to ensure compliance. The implementation plan leveraged the existing D&SWS and other SAF/AQ initiatives to focus on early acquisition involvement.[83]

Systems Engineering Revitalization

The command also continued to develop and implement procedures and initiatives designed to revitalize systems engineering practices and processes, especially in the early stages of the acquisition life cycle. The Air Force recognized that its developing programs generally suffered from a lack of robust systems engineering throughout their

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[80] Blankenship, Ciborski, Ferguson, et al., 2010b, p. 97.

[81] Blankenship, Ciborski, Ferguson, et al., 2010b, p. 99.

[82] Blankenship, Ciborski, Ferguson, et al., 2010b, p. 108.

[83] Blankenship, Ciborski, Ferguson, et al., 2010b, p. 109.

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life cycle. This effort, in progress for several years, sought to ameliorate this situation, especially within AFMC and AFSPC.[84]

SAF/AQ, with support from AFMC's Directorate of Engineering and Technical Management, published the *Early Systems Engineering Guidebook*, dated March 31, 2009. The guide focused on systems engineering efforts prior to the issuance of the analyses of alternatives (AoAs) and was intended for use by the Air Force and its industry partners. AFMC also published AFMC Instruction 63-1202, *Air Force Materiel Command Center Engineering Support for Air Force Global Logistics Support Center Operations*, which defined both Headquarters AFMC and AFGLSC engineering support for the latter.[85]

Headquarters AFMC also issued a revision of AFMC Instruction 63-1201, *Implementing Operational Safety Suitability and Effectiveness (OSS&E) and Life Cycle Systems Engineering*, on October 14, 2009. AFMC's Directorate of Engineering and Technical Management substantially revised this instruction to ensure the application of disciplined systems engineering practices throughout a program's life cycle. It also identified specific responsibilities for organizations, program managers, and chief/lead engineers.[86]

Acquisition intelligence also continued to mature in FY 2009. AFMC's Directorate of Intelligence and Requirements standardized the analytical process for center intelligence offices to provide intelligence supportability analysis to the programs and projects in the AFMC portfolio. The process decomposed intelligence-sensitive programs to derive intelligence requirements for the program manager and the intelligence community.[87]

eLog21 Developments

During the year, ECSS underwent organizational and managerial changes to streamline the acquisition phase of the program. Of note, Brig Gen (select) Kenneth J. Moran assumed the position of ECSS PEO and program director on July 1, 2009. PEOs and program directors' responsibilities were broadened to include information technology legacy system sustainment until ECSS subsumed the associated legacy functionality.[88]

High velocity maintenance, another eLog21 initiative and important component of ACS, originated at WR-ALC as a pilot program to move aircraft through programmed depot maintenance faster by adopting applicable private-sector depot-level maintenance equivalent best practices and applying them to Air Force depot opera-

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[84] Blankenship, Ciborski, Ferguson, et al., 2010b, p. 126.

[85] Blankenship, Ciborski, Ferguson, et al., 2010b, p. 127.

[86] Blankenship, Ciborski, Ferguson, et al., 2010b, p. 127.

[87] Blankenship, Ciborski, Ferguson, et al., 2010b, p. 140.

[88] Blankenship, Ciborski, Ferguson, et al., 2010b, p. 221.

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tions. Basically, high velocity maintenance sought to increase the manhours per day devoted to each airframe and change the current five-year programmed depot maintenance induction cycle in which the aircraft was completely overhauled once every five years—to an 18-month cycle in which the work was divided into four smaller work packages executed every 18 months.[89]

Warfighter Acquisition Support

On December 23, 2008, Headquarter AFMC published AFMC Instruction 63-114, *Warfighter Urgent Operational Needs Process and the Rapid Response Process*. The new instruction supported Air Force Instructions 10-601, *Capabilities-Based Requirements Development, and 63-114, Rapid Response Process* (later, *Quick Reaction Capability Process*), by defining the roles, processes, and responsibilities of AFMC personnel supporting warfighter urgent operational needs, which normally took priority over all other peacetime workload. Warfighter urgent operational needs represented life-threatening or combat mission-threatening warfighter needs during a conflict or crisis, with requests submitted by commanders to their appropriate lead MAJCOMs. The MAJCOM then validated the need and developed a COA, including a technical solution, funding strategy, acquisition strategy, test and evaluation strategy, and a requirements strategy. In addition to delineating command processes for urgent operational needs and rapid response process requirements, AFMC Instruction 63-114 procedures also supported joint urgent operational needs.[90]

Continuing Leadership Changes

Sue C. Payton served as the Assistant Secretary of the Air Force for Acquisition until April 30, 2009. (Following her departure, David M. Van Buren served as acting assistant secretary.) In FY 2009, Congress passed two reform acts to improve the DoD acquisition workforce, strengthen the front end of the acquisition process, improve cost estimation, and improve the execution phase of weapon system development programs. Another reform mandated prototyping and competition during the technology demonstration acquisition phase of programs. As mentioned earlier, the Secretary of the Air Force Michael B. Donley expanded the responsibilities of the SAE and the AFMC commander by requiring these key acquisition officials to certify capability development documents for major programs.[91]

There were also changes in the AFMC senior leadership in FY 2010. Gen Donald J. Hoffman remained the AFMC commander throughout the fiscal year, while Lt Gen

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[89] Blankenship, Ciborski, Ferguson, et al., 2010b, p. 221.

[90] Blankenship, Ciborski, Ferguson, et al., 2010b, p. 313.

[91] Jennifer Blankenship, James R. Ciborski, Paul Ferguson, Thomas W. Mason, and William W. Suit, *History of the Air Force Materiel Command, 1 Oct 2009–30 Sep 2010*, draft, Wright-Patterson AFB, Ohio: Air Force Materiel Command, History Office, January 2010a, p. xvi.

Pre-Publication Copy: Not Cleared for Open Publication. Do not cite or quote.

Janet C. Wolfenbarger succeeded Lt Gen Terry L. Gabreski as vice commander. Lt Gen Wolfenbarger had previously served as AFMC's Director of Intelligence and Requirements.[92] General Hoffman's priorities remained mostly the same, but he singled out "implementing effective and efficient life-cycle management" during this period.[93]

There was further change in AFMC's primary subordinate units with actions approved by the Air Force Chief of Staff to replace mission (but not base operating support) wings, groups, and squadrons within AFMC's product centers, air logistics centers, test centers, and specialized mission centers with a structure based on non-unit directorates, divisions, and branches. This change represented a return, with a few exceptions, to the organizational model for these centers that had existed prior to FYs 2005–2006. Among the reasons for the return were dissatisfaction with some unintended consequences of the wing/group/squadron structure.[94]

AFMC carried on its efforts under the AIP and, in support of the plan's second initiative, made improvements to the requirements generation process with significant involvement of the AFMC commander. Since July 11, 2006, the AFMC commander had served as process owner for D&SWS, which fostered continuous process improvement. A funding shortfall from the Air Force made it necessary to realign D&SWS process improvement initiatives in new homes.[95]

Secretary Gates announced a restructuring of the F-35 Joint Strike Fighter program, a change in its leadership, and a grade increase for its PEO from a two- to a three-star billet. Soon thereafter, the program was shifted to a fixed-price contract for the initial production phase and, despite breaching the Nunn-McCurdy threshold, all three F-35 variants entered flight testing by June 2010.[96]

A Return to Functional Management

In the process of responding to Corona South directives regarding its restructure back to directorates, divisions, and branches, AFMC faced the challenge of moving back to a "functional management" model in which directorates were responsible for the "organizing, training, and equipping of acquisition professionals over their careers." One of the objections to the directives making a unit (wing, group, or squadron) commander or civilian leader responsible for this mission was that it had eroded the process of mentoring within the functional disciplines. The fifth AIP initiative (Establish clear lines of authority and accountability within acquisition organizations) had set a broad policy objective and did not provide a specific direction. Ultimately, "functional man-

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[92] Blankenship, Ciborski, Ferguson, et al., 2010a, p. 1.

[93] Blankenship, Ciborski, Ferguson, et al., 2010a, p. 2.

[94] Blankenship, Ciborski, Ferguson, et al., 2010a, p. xiv.

[95] Blankenship, Ciborski, Ferguson, et al., 2010a, p. xvi.

[96] Blankenship, Ciborski, Ferguson, et al., 2010a, p. xvii.

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agement" would be extended to all centers. A revision of AFMC Instruction 36-2645, published on January 31, 2011, stated that "to improve the functional management process, AFMC decided to utilize Headquarters, Center and Organization Senior Functionals, and to expand functional management beyond acquisition organizations to the entire MAJCOM."[97]

The command history for FY 2011 is under preparation and AFMC leadership has not signed off on it. Therefore, we end our history with the limited data available for FY 2010.

The Central Issues: Are They History?

Warfighter Support

The list of prevailing issues prior to and after the activation of AFMC, presented at the beginning of this appendix, had as its first item "how to organize to best support the customer (warfighters)." Histories do not take measurements of how well organizations support a goal that is common to all. Over the years, organizations and policies have been directed at enacting efficiencies and effectiveness to achieve it.

Are there valid measurements available to match up either acquisition or, especially, support problems affecting warfighters with particular organizations (that is, support organizations)? History may or may not suggest an answer. The historical evidence shows that warfighters have been supported, but it is difficult to judge precisely what part the initiatives and organizational changes have played.

How Best to Develop and Acquire Weapon Systems

To address the second central issue of how systems are best developed and acquired, we depict the major evolutionary events and organizations used by AAF and then by the Air Force. This historical account is not intended to compare acquisition approaches or show whether prior improvement efforts have succeeded or failed. We provide some data from Air Force historical accounts only to show a motivation for improvement.

The Fifth Acquisition Improvement Plan Initiative and New FY 2009 PEO Authorizations.

AFMC's PEO structure remained in place until FY 2009, when three additional PEOs were assigned in concert with the AIP. AFMC was the lead command for the second initiative, "Improve the requirements generation process," and the fifth initiative, "Establish clear lines of authority and accountability within acquisition organizations."

[97] Blankenship, Ciborski, Ferguson, et al., 2010a, p. 42.

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The latter initiative consisted of four actions, one of which concerned PEO alignment: "Reassess the PEO construct and offer recommendations for improvement.[98]

On May 8, 2009, SAF/AQ tasked Headquarters AFMC to conduct this reassessment and to offer recommendations for improvement. The command's Directorate of Intelligence and Requirements briefed its recommendations to the Secretary of the Air Force and the Air Force Chief of Staff on August 25, 2009. Secretary Donley and General Schwartz approved AFMC's recommendation to establish the additional authorizations. AFMC gained the first three additional PEOs during FY 2009 on the following dates: ECSS, July 29, 2009; KC-X Tanker Program, July 29, 2009; Air Force Intelligence, Surveillance, and Reconnaissance Programs, August 6, 2009. All three of these positions were located at Wright-Patterson AFB.[99]

New PEOs in FY 2010

The additional authorizations reduced the span of control for AFMC's Aeronautical Systems Center and Electronic Systems Center commanders/PEOs, retained the existing capabilities-based portfolios (to the extent practical), and provided commonality with the other services, which had already implemented a larger PEO construct. In FY 2010, AFMC added eight more PEOs. This brought the total number of new Air Force PEOs to 11 (all within AFMC). The Aeronautical Systems Center and Electronic Systems Center each received five new PEOs. The 11th new position, the PEO for Strategic Systems, was established to oversee programs at the Air Force Nuclear Weapons Center at Kirtland AFB, New Mexico. Upon full implementation, the Air Force PEO construct totaled 17 PEOs (including 14 in AFMC), compared with the Navy's 15 and the Army's 13.[100]

The PEO increases raised the issue of the legality of center commanders/PEOs holding dual responsibilities for both command and program execution, but Van Buren, the acting Assistant Secretary of the Air Force for Acquisition, received permission from OSD to continue this arrangement at the Aeronautical Systems Center, Electronic Systems Center, and Air Armament Center. To align with the requirements of DoD Directive 5000.01, *The Defense Acquisition System*, all PEOs were required to be rated by the SAE. In turn, the PEOs rated the system program managers and development system managers in their portfolios. By adding additional authorizations, the Air Force expected that each PEO would be able to focus on program execution while relying on deputy directors to oversee the organize, train, and equip aspects of program management. According to Lt Gen Janet C. Wolfenbarger, the AFMC Vice Commander,

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[98] Blankenship, Ciborski, Ferguson, et al., 2010a, p. 73.

[99] Blankenship, Ciborski, Ferguson, et al., 2010a, p. 75.

[100] Blankenship, Ciborski, Ferguson, et al., 2010a, p. 75.

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> We focused on establishing clear lines of authority and accountability and on better organizing Air Force Materiel Command to operate in the current acquisition environment. . . . And by working to establish more program executive officer positions, we've been able to provide more experienced management to closely monitor and work acquisition issues.[101]

Integrated Life-Cycle Management Chain of Authority

Our third central issue concerns how life-cycle responsibilities are best shared between separate skill sets. This account ends on the subject of ILCM, and, as history has shown, it involves two issues, which have seemingly involved military aviation from day one. They are (1) whose responsibility it is to manage a weapon system throughout its life cycle, which has usually involved a number of organizations and personnel with separate skill sets, and (2) how best to manage those activities, particularly in sustainment phases, so that they are effectively carried out. History shows varying approaches and opinions as answers to these questions. Today, these questions have a single answer: ILCM.

The Air Force prescription for the ILCM chain of authority is specified in Air Force Instruction 63-101, *Acquisition and Life-Cycle Management:*

> Acquisition management responsibility for all Acquisition Category (ACAT) programs flows from the Service Acquisition Executive [SAE] to the Program Executive Officer [PEO] or Designated Acquisition Official [DAO] to the accountable Program Manager [PM].

Air Force programs are managed within two programmatic execution chains: one for programs primarily in acquisition and one for those in sustainment. The AFMC commander provided technical assistance, infrastructure, test capabilities, laboratory support, professional education, training and development, management tools, and all other aspects of support to the SAE, PEOs, and program manager and also served as a member of the ILCM Executive Forum.[102]

The major responsibilities of the principal ILCM chain of authority as of this writing are as follows:

- The SAE was the designated senior corporate operating official.
- The AFMC commander supports the SAE, PEOs, DAOs, and program managers.
- PEOs are dedicated to executive management and supervision of a portfolio of mission-related ACAT and selected programs.
- DAOs are dedicated to executive management at the air logistics centers of delegated ACAT II and III programs.

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[101] Blankenship, Ciborski, Ferguson, et al., 2010a, p. 76.

[102] Blankenship, Ciborski, Ferguson, et al., 2010a, p. 71.

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- Program managers are accountable for the designated programs in terms of cost, schedule, and performance.[103]
- Product support managers, the most recent addition to the chain of authority, lead the development, implementation, top-level integration, and management of all sources of product support, reporting directly to the program manager.[104]

If any critical issues remain with respect to program management transfer for sustainment, given the current ILCM policy and its execution, they are not reflected in the more recent historical documents available to us.

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[103] Blankenship, Ciborski, Ferguson, et al., 2010a, p. 72.

[104] Public Law 111-84, National Defense Authorization Act for Fiscal Year 2010, October 28, 2009; Air Force Instruction 63-101, *Acquisition and Sustainment Life Cycle Management*, April 8, 2009, incorporating change 4, August 3, 2011.

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APPENDIX C

Annotated Bibliography of Related Work

In this appendix, we list the public laws, academic literature, and U.S. Department of Defense (DoD), joint, and Air Force publications reviewed as part of this analysis. For each publication, we list the title, date, and a synopsis of the relevant work as it pertains to the planned Air Force Materiel Command (AFMC) reorganization.

Laws and Related Works

Public Law 99-433, Goldwater-Nichols Department of Defense Reorganization Act of 1986, October 1, 1986.

This legislation reaffirmed civilian control of the military and primarily concerns the joint warfighting arena. Specifically, it outlined the position of Under Secretary of Defense for Acquisition and established the requirement for service acquisition executives (SAEs) to exclusively manage service acquisition functions. Program executive office structure was set in 1989 following Secretary of Defense Cheney's defense management review report to the President incorporating the full implementation of the Packard Commission report.

Public Law 99-961, National Defense Authorization Act for Fiscal Year 1987, November 14, 1986.

This follow-on legislative action to Goldwater-Nichols outlined the duties, responsibilities, and authority of the Under Secretary of Defense for Acquisition and Technology.

Public Law 111–84, National Defense Authorization Act for Fiscal Year 2010, October 28, 2009.

This legislation required the U.S. Department of Defense (DoD) to establish the position of product support manager (PSM) and detailed the requirements for that position within the Defense Acquisition System.

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Public Law 112-81, National Defense Authorization Act for Fiscal Year 2012, Conference Report, 112-329, 2011.

This public law tasked the Secretary of the Air Force with selecting a federally funded research and development center to submit a report to the relevant congressional defense committees on the alignment, organizational reporting, military command structure, and performance rating of Air Force system program managers, sustainment program managers, and PSMs at the air logistics centers (later, air logistics complexes).

10 U.S. Code, Section 8014: Office of the Secretary of the Air Force.

This section of the U.S. Code reads as follows:

- There is in the Department of the Air Force an Office of the Secretary of the Air Force. The function of the Office is to assist the Secretary of the Air Force in carrying out his responsibilities.
- The Office of the Secretary of the Air Force is composed of the following:
  - The Under Secretary of the Air Force.
  - The Assistant Secretaries of the Air Force.
  - The General Counsel of the Department of the Air Force.
  - The Inspector General of the Air Force.
  - The Chief of Legislative Liaison.
  - The Air Reserve Forces Policy Committee.
  - Such other offices and officials as may be established by law or as the Secretary of the Air Force may establish or designate.
- The Office of the Secretary of the Air Force shall have sole responsibility within the Office of the Secretary and the Air Staff for the following functions:
  - Acquisition.
  - Auditing.
  - Comptroller (including financial management).
  - Information management.
  - Inspector General.
  - Legislative affairs.
  - Public affairs.
- The Secretary of the Air Force shall establish or designate a single office or other entity within the Office of the Secretary of the Air Force to conduct each function specified in paragraph (1). No office or other entity may be established or designated within the Air Staff to conduct any of the functions specified in paragraph (1).
- The Secretary shall prescribe the relationship of each office or other entity established or designated under paragraph (2) to the Chief of Staff and to the Air Staff and shall ensure that each such office or entity provides the Chief of Staff such

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staff support as the Chief of Staff considers necessary to perform his duties and responsibilities.

- The vesting in the Office of the Secretary of the Air Force of the responsibility for the conduct of a function specified in paragraph (1) does not preclude other elements of the executive part of the Department of the Air Force (including the Air Staff) from providing advice or assistance to the Chief of Staff or otherwise participating in that function within the executive part of the Department under the direction of the office assigned responsibility for that function in the Office of the Secretary of the Air Force.
- The head of the office or other entity established or designated by the Secretary to conduct the auditing function shall have at least five years of professional experience in accounting or auditing. The position shall be considered to be a career reserved position as defined in section 3132 (a)(8) of title 5.
- The Office of the Secretary of the Air Force shall have sole responsibility within the Office of the Secretary and the Air Staff for the function of research and development.
- The Secretary of the Air Force may assign to the Air Staff responsibility for those aspects of the function of research and development that relate to military requirements and test and evaluation.
- The Secretary shall establish or designate a single office or other entity within the Office of the Secretary of the Air Force to conduct the function specified in paragraph (1).
- The Secretary shall prescribe the relationship of the office or other entity established or designated under paragraph (3) to the Chief of Staff of the Air Force and to the Air Staff and shall ensure that each such office or entity provides the Chief of Staff such staff support as the Chief of Staff considers necessary to perform his duties and responsibilities.
- The Secretary of the Air Force shall ensure that the Office of the Secretary of the Air Force and the Air Staff do not duplicate specific functions for which the Secretary has assigned responsibility to the other.
  - The total number of members of the armed forces and civilian employees of the Department of the Air Force assigned or detailed to permanent duty in the Office of the Secretary of the Air Force and on the Air Staff may not exceed 2,639.
  - Not more than 1,585 officers of the Air Force on the active-duty list may be assigned or detailed to permanent duty in the Office of the Secretary of the Air Force and on the Air Staff.
  - The total number of general officers assigned or detailed to permanent duty in the Office of the Secretary of the Air Force and on the Air Staff may not exceed 60.

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- The limitations in paragraphs (1), (2), and (3) do not apply in time of war or during a national emergency declared by the President or Congress. The limitation in paragraph (2) does not apply whenever the President determines that it is in the national interest to increase the number of officers assigned or detailed to permanent duty in the Office of the Secretary of the Air Force or on the Air Staff.

10 U.S. Code, Section 8016: Assistant Secretaries of the Air Force.

This section of the U.S. Code reads as follows:

- There are four Assistant Secretaries of the Air Force. They shall be appointed from civilian life by the President, by and with the advice and consent of the Senate.
- The Assistant Secretaries shall perform such duties and exercise such powers as the Secretary of the Air Force may prescribe.
  - One of the Assistant Secretaries shall be the Assistant Secretary of the Air Force for Manpower and Reserve Affairs. He shall have as his principal duty the overall supervision of manpower and reserve component affairs of the Department of the Air Force.
  - One of the Assistant Secretaries shall be the Assistant Secretary of the Air Force for Financial Management. The Assistant Secretary shall have as his principal responsibility the exercise of the comptroller functions of the Department of the Air Force, including financial management functions. The Assistant Secretary shall be responsible for all financial management activities and operations of the Department of the Air Force and shall advise the Secretary of the Air Force on financial management.
  - One of the Assistant Secretaries shall be the Assistant Secretary of the Air Force for Acquisition. The principal duty of the Assistant Secretary shall be the overall supervision of acquisition matters of the Department of the Air Force.
  - The Assistant Secretary shall have a Principal Military Deputy, who shall be a lieutenant general of the Air Force on active duty. The Principal Military Deputy shall be appointed from among officers who have significant experience in the areas of acquisition and program management. The position of Principal Military Deputy shall be designated as a critical acquisition position under section 1733 of this title.

President's Blue Ribbon Commission on Defense Management (Packard Commission), *Formula for Action: A Report to the President on Defense Acquisition*, April 1986.

The commission recommended the creation of the position of Under Secretary of Defense for Acquisition, that the services establish a comparable senior position to be filled by a top-level civilian presidential appointee, that the service acquisition execu-

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tive appoint a number of program executive officers, that DoD substantially reduce the number of acquisition personnel, and that federal law be recodified into a single, greatly simplified statue that is applicable government-wide

Schwartz, Moshe, *Defense Acquisitions: How DoD Acquires Weapon Systems and Recent Efforts to Reform the Process*, Washington, D.C.: Congressional Research Service, April 23, 2010.

This report outlines DoD's defense acquisition structure, discusses major reports addressing defense acquisition, and considers recent DoD efforts to improve how the department acquires weapon systems. It also includes a description of congressional efforts to reform DoD's acquisition process.

Hatch, Senators Orrin G., Saxby Chambliss, James M. Inhofe, Michael S. Lee, and Johnny Isakson and Representative Tom Cole, letter to Andrew R. Hoehn, Director and Vice President, RAND Project AIR FORCE, RAND Corporation, February 17, 2012.

This letter details the concerns of the signing parties on the proposed AFMC reorganization, focusing on assurance of warfighter support, function preservation, and the assignment of program offices to a reporting chain outside the depot maintenance and supply chain management reporting structures in AFMC.

Department of Defense and Services Policy and Guidance

Cheney, Dick, Secretary of Defense, *Defense Management Report to the President*, Washington, D.C.: U.S. Department of Defense, July 1989.

This report established the goal of fully implementing the Packard Commission's recommendations. It also defined the program executive officers' (PEOs') roles, responsibilities, reporting chain, and duty constraints for managing programs under their purview. It also cautions that the PEO should not have other duties in addition to managing his or her acquisition programs.

Office Under Secretary of Defense for Acquisition, Technology, and Logistics, Directive-Type Memorandum 10-015, *Requirements for Life Cycle Management and Product Support*, October 6, 2010, incorporating Change 2, December 9, 2011.

The memorandum establishes a policy to implement and institutionalize the requirements of Section 805 of Public Law 111-84 (the National Defense Authorization Act for Fiscal Year 2010), directing a number of changes to DoD policies designed to

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improve weapon systems life-cycle management and product support by establishing new requirements that directly affect acquisition, fielding, and sustainment decisions.

U.S. Department of Defense Directive 5000.01, *The Defense Acquisition System*, May 12, 2003, Certified Current as of November 20, 2007.

This general directive outlines the authorities and responsibilities associated with defense acquisition.

U.S. Department of Defense Instruction 5000.02, *Operation of the Defense Acquisition System*, December 8, 2008.

This instruction describes the Defense Acquisition System's process and procedures.

U.S. Department of Defense, *Defense Acquisition Guidebook*, Washington, D.C., January 10, 2012.

The fundamental acquisition principles and procedures that the department follows are described in DoD Directive 5000.01 and DoD Instruction 5000.02. The Defense Acquisition Guidebook is designed to complement those policy documents by providing the acquisition workforce with discretionary best practices that should be tailored to the needs of each program.

U.S. Department of Defense, *Product Support Manager Guidebook*, Washington, D.C., April 2011.

This guidebook is written for the product support manager and provides references addressing the requirements for managing product support across the entire life cycle of a weapon system. It is designed to serve as an operating guide to assist the product support manager and the acquisition community with the implementation next-generation product support strategies, and it better aligns the acquisition and life-cycle product support processes.

Office of the Secretary of Defense Resource Management Decision 703A2, released in January 2011.

This decision called for all the services to return civilian staffing to FY 2010 levels.

Office of the Secretary of Defense Resource Management Decision 802, released in January 2010.

This decision mandated insourcing options to implement contractor reductions and civilian end-strength increases by FY 2015.

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U.S. Joint Chiefs of Staff, *Operation of the Joint Capabilities Integration and Development System*, Chairman of the Joint Chiefs of Staff Manual 3170.01C, May 1, 2007.

This manual describes the Joint Capabilities Integration and Development System, which is used to validate material requirements needs based on how well they fit the capability needs assessments performed by the combat commanders.

U.S. Department of the Navy, *Competency Aligned Organization Concept of Operations for the Naval Air Systems Command and the Affiliated Program Executive Offices*, August 25, 2010.

This guide describes the Navy's Competency Aligned Organization CONOPS used by Naval Air Systems Command (NAVAIR) and the program executive offices, which emphasizes the collaborative relationships and contributions of each of the primary CONOPS elements involved in delivering warfighting capabilities. The information in this guide helps the workforce understand its role as it works with all three CONOPS elements (in many cases, simultaneously)—that is, aligned to a competency; supporting one or more PEOs, PMAs, or other customers; and conducting their work at headquarters, a warfare center, or a fleet readiness center.

As part of its plan to implement the directives of the Secretary of Defense's defense management report, the Navy established the naval aviation program executive offices and realigned several programs. A key objective of this realignment was to avoid duplication between NAVAIR and the PEOs. The PEOs would manage major acquisition category programs and draw systems acquisition and in-service support from NAVAIR, in accordance with a formal operating agreement. *The PEOs report to the Assistant Secretary of the Navy for Research, Development, and Acquisition, the Navy's SAE, on acquisition matters and to the Chief of Naval Operations via the NAVAIR commander on matters related to in-service support. Programs not assigned to the PEOs would be managed by the NAVAIR commander, who has the same dual reporting responsibility to the Assistant Secretary of the Navy for Research, Development, and Acquisition and the Chief of Naval Operations.* Both the NAVAIR commander and the PEOs would continue to use program offices (PMAs) to manage and execute all aspects of their assigned programs. Reporting relationships and authorities are, codified in the SECNAV Instruction 5400.15 series, the Department of the Navy's instructions on research, development, acquisition, and logistics responsibilities and accountabilities.

NAVAIR and the PEOs collaborated to design and implement a new way of operating founded on three major elements:

- A competency-aligned organization comprises multiple sites, nationally aligned communities of practice known as competencies, to develop and sustain technical and business expertise in support of the PEOs, PMAs, IPTs, and other customers. Competencies consist of the people, business and technical policies, work

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processes, training, tools, and mission facilities needed to deliver products and services. There are eight national competencies:
– program management (AIR-1.0)
– contracts (AIR-2.0)
– research and engineering (AIR-4.0)
– test and evaluation (AIR-5.0)
– logistics and industrial operations (AIR-6.0)
– corporate operations (AIR-7.0)
– comptroller (AIR-10.0)
– counsel (AIR-11.0).

Note that the Naval Air Technical Data and Engineering Service Command is a functional extension of the AIR-6.0 competency.

- Integrated program teams (IPTs), which PEOs and PMAs use and other team structures to plan, manage, and execute acquisition and life-cycle program objectives. IPTs are the most common type of team structure in the CONOPS. They are product-focused and responsible for meeting cost, schedule, and performance guidelines. Other team structures include externally directed teams and enterprise teams.
- NAVAIR Headquarters Naval Air Warfare Centers and fleet readiness centers. These major components of NAVAIR's command structure are hubs of capability that provide IPTs (and other team structures) and their supporting competencies with cost-effective and operationally productive work environments, as well as the investment, planning, and budgeting capabilities to ensure the support of competency and IPT activities.

Command Structure and Relationships. In support of Navy and national strategic direction and priorities, NAVAIR and the affiliated naval aviation PEOs develop, deliver, and sustain aircraft, weapons, and systems effectively and efficiently with proven capability and reliability to help sailors and marines achieve mission success. In partnership with industry, they operate as providers (in conjunction with other providers, such as the Naval Inventory Control Point, other Navy systems commands, and warfare centers) within the naval aviation enterprise to help shape the requirements, products, services, and resource decisions that drive the readiness of Naval aviation units. NAVAIR is a key naval aviation enterprise stakeholder, along with the commander of Naval Air Forces, fleet warfighters, naval aviation resource sponsors (from the Office of the Chief of Naval Operations and Headquarters, U.S. Marine Corps), and the principal providers of naval aviation material acquisition and in-service support. Operating within this construct, *NAVAIR and the PEOs utilize the CONOPS to provide research and technology, systems acquisition of new weapon systems and equipment,*

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sustainment of in-service weapon systems and support, and decision support. In providing that support, NAVAIR operates with a command structure consisting of a headquarters component and subordinate commands: the Naval Air Warfare Center, Aircraft Division; the Naval Air Warfare Center, Weapons Division; and eight fleet readiness centers. NAVAIR serves as the host systems command for the naval aviation PEOs and their assigned programs. All elements of NAVAIR are responsible for providing support to the PEOs in accordance with the operating agreement.

Command Structure and Reporting Relationships. While each of the major entities in the CONOPS construct is defined by its individual mission and function, they operate collectively to provide permeable, horizontal access to aggregate competency capabilities at headquarters, the naval air warfare centers, and the fleet readiness centers. In so doing, they contribute to the success of programs, warfighters, and other customers. The following top-level descriptions are provided for greater understanding of the mission of each entity as a contributor to NAVAIR's overall mission:

- *NAVAIR Headquarters* (Patuxent River, Md.) sets the overall command vision, goals, objectives, governance, and systems acquisition/in-service policy and procedures; manages programs not assigned to the PEOs.
- *NAWC Aircraft Division* (Patuxent River, Md.; Lakehurst, N.J.; Orlando, Fla.) serves as the command's research, development, test, evaluation, and fleet support center of excellence for fixed- and rotary-wing aircraft and their propulsion systems, avionic systems, training systems, takeoff and landing systems, associated support.
- *NAWC Weapons Division* (China Lake, Calif.; Point Mugu, Calif.) serves as the Navy's and the command's research, development, test, evaluation, and fleet support center of excellence for weapons, armaments, and their associated equipment; electronic warfare; and weapon system integration.
- *Fleet readiness centers* (Solomons Island, Md; Norfolk, Va.; Cherry Point, N.C.; Jacksonville, Fla.; San Diego, Calif.; Lemoore, Calif.; Whidbey Island, Wash.; Atsugi, Japan; and other distributed sites) serve as the command's centers of excellence for repair and overhaul of naval aviation systems and equipment. In-service support centers, resident at the fleet readiness centers, provide collaborative engineering, logistics, industrial, and program management support services. Note that the commander of the fleet readiness centers is located at the Patuxent River, Md., site and has a dual reporting responsibility to both the NAVAIR commander and the commander of Naval Air Forces.)

The commanders of the Naval Air Warfare Center, Aircraft Division, and the Naval Air Warfare Center, Weapons Division, each report to the NAVAIR commander. Each fleet readiness center is a distinct unit that reports to the commander of the fleet readiness center, who, in turn, reports to the commanders of Naval Air Forces

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and NAVAIR. Headquarters, the naval air warfare centers, and the fleet readiness centers support NAVAIR's mission by providing the physical infrastructure, a common social structure, and the financial framework within which the competencies, IPTs, and other teams operate. They provide Navy institutional leadership, representing the Navy with their communities and with external agencies. They also provide the governance of shared interests, including long-term investments of the multiple competency and team groups operating within their boundaries.

The Command Leadership Team is an executive-level strategy and decisionmaking forum. Its purpose is to ensure program success and effectiveness, set command strategic direction, assess performance against defined metrics, and direct business and technical operations. The team operates inclusively with representation and input from PEO, competency, naval air warfare center, fleet readiness center, and headquarters leaders and serves as the process owner for the CONOPS. As such, it is responsible for the effective interaction between the competencies, the PEOs and program offices (PMAs), and headquarters, the naval air warfare centers, and the fleet readiness centers in meeting the needs of the warfighter and other supported customers.

Donley, Michael B., Secretary of the Air Force, Letter and attached memorandum to Senators Orrin G. Hatch, Saxby Chambliss, James M. Inhofe, Michael S. Lee, Johnny Isakson, and Tom Coburn and Representatives Rob Bishop, Tom Cole, and Austin Scott, December 9, 2011

The letter details a mutual understanding of the AFMC reorganization and agreement on approximately 22 separate issues.

Office of the Deputy Assistant Secretary of the Air Force for Acquisition Integration (SAF/AQX), "Request for RAND Project Air Force (PAF) Project Authorization with Attached AFMC Reorganization Project Description," memorandum to the Director of Strategic Planning, Office of the Deputy Chief of Staff for Strategic Plans and Programs, Headquarters U.S. Air Force (AF/A8X), January 20, 2012.

This memorandum provided RAND Project AIR FORCE with the objectives, tasks, and timelines for the generation of an independent and objective analysis of the AFMC reorganization proposal for submission to Congress.

Wolfenbarger, Lt Gen Janet C., Office of the Assistant Secretary of the Air Force for Acquisition, letter to Senator Saxby Chamblis, March 16, 2012.

This letter addresses Senator Chambliss' questions regarding AFMC reorganization prior to General Wolfenbarger's confirmation hearing.

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Air Force Policy Directive 38-1, *Organization and Unit Designations*, August 24, 2011.

This directive specifies policies concerning the organization of the Air Force, including the designation of units. It implements statutory requirements in Title 10 of the U.S. Code, Section 8013. It also lists and describes the principal characteristics *desired* in Air Force organizations:

- Mission Orientation. Organizations should have a reason to exist and should be designed to achieve the outcome defined in the applicable mission directive.
- Unambiguous Command. Organizational structure should provide a clear chain-of-command running from the President to the most junior Airman.
- Decentralization. Organizations should be designed so lower echelons can achieve objectives without needing continuous control from above.
- Agility. Organizations should be structured so personnel can recognize problems, find solutions, make decisions, and implement them quickly.
- Flexibility. Organizations should be capable of adapting rapidly to changing external circumstances.
- Simplicity. Organizational structure should be as plain and straightforward as possible because complexity often inhibits rather than facilitates organizational effectiveness.
- Standardization. Organizations with like responsibilities should have similar organizational structures.

Air Force Instruction 38-101, *Manpower and Organization*, March 16, 2011.

This instruction describes the objectives and principles of Air Force organization, prescribes various levels and standard structures for organizations, and outlines procedures for establishing and modifying organizations.

Air Force Policy Directive 63-1/20-1, *Acquisition and Sustainment Life Cycle Management*, April 3, 2009.

This policy directive describes an Air Force acquisition and sustainment integrated life-cycle management (ILCM) framework for Air Force systems, subsystems, end items, services, and activities. The approach "shall be applied to Air Force acquisition and sustainment activities, which shall provide for seamless governance and transparent processes to acquire and sustain programs (systems, subsystems, end-items, and services) to satisfy validated needs. ILCM shall recapitalize Air Force capabilities through maximum acquisition cycle time efficiency; and provide agile support that will optimize fielded capabilities and the supply chain, minimize the logistics footprint, and reduce total ownership cost" (p. 2, para. 1).

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Air Force Instruction 63-101, *Acquisition and Sustainment Life Cycle Management*, April 8, 2009, incorporating Change 4, August 3, 2011.

The purpose of this instruction is to implement direction from the Secretary of the Air Force as outlined in Air Force Policy Directive 63-1/20-1, *Acquisition and Sustainment Life Cycle Management*. The primary mission of the ILCM enterprise is

> to provide seamless governance, transparency and integration of all aspects of weapons systems acquisition and sustainment management. This instruction must be used in conjunction with Air Force Instruction (AFI) 10-601, *Capabilities-Based Requirements Development*, AFI 99-103, *Capabilities Based Test and Evaluation*, AFI 63-1201, *Life Cycle Systems Engineering*, and AFI 20-101, *Logistics Strategic Planning Procedures*, to provide an integrated framework for the implementation of ILCM. (p. 10, para. 1.1)

It goes on to state that all Air Force acquisition and sustainment programs "shall have a clear and unambiguous governance chain of authority" (p. 16, para. 1.7). Acquisition management responsibility for all acquisition categories (ACATs) flows without intervention from the service acquisition executive (SAE) to the program executive officer (PEO) to the system program manager (SPM) or program manager. (See Table A.1.) Responsibility for sustainment program management flows from the commander of Air Force Materiel Command (AFMC/CC) or commander of Air Force Space Command (AFSPC/CC) to the appropriate subordinate commander or director

Table A.1
Milestone Decision Authority Delegation, ACAT

Milestone Decision Authority	Designation Authority	Milestone Decision Authority
ID	Defense acquisition executive	Defense acquisition executive
IC	Defense acquisition executive	SAE
IAM	Office of the Assistant Secretary of Defense for Networks and Information Integration	Office of the Assistant Secretary of Defense for Networks and Information Integration
IAC	Office of the Assistant Secretary of Defense for Networks and Information Integration	SAE
II	SAE	SAE or PEO/designated acquisition official (as delegated)
III	SAE	PEO/deputy PEO/designated acquisition official (as delegated)

SOURCE: Air Force Instruction 63-101, 2009, Table A2.1.

NOTE: Refer to U.S. Department of Defense Instruction 5000.02, *Operation of the Defense Acquisition System*, December 8, 2008, Table E3.T1, for ACAT descriptions.

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to the sustainment SPM, program manager, or product group manager. The SPM/program manager is as defined in U.S. Department of Defense Directive 5000.01 as the *program manager*.

Air Force Pamphlet 63-128, *Guide to Acquisition and Sustainment Life Cycle Management*, October 5, 2009.

This pamphlet describes, among other aspects of the acquisition and sustainment management processes, the transfer of program responsibility from acquisition organizations to sustainment organizations.

Air Force Instruction 63-131, *Modification Program Management*, November 6, 2009.

The purpose of this instruction is to implement direction from the Secretary of the Air Force contained in Air Force Policy Directive 63-1/20-1, *Acquisition and Sustainment Life Cycle Management*. This instruction requires that modifications be managed as efforts using acquisition and sustainment processes, techniques, and governance as outlined in AFI 63-101, *Acquisition and Sustainment Life Cycle Management*.

Air Force Technical Order 00-25-4, *Depot Maintenance of Aerospace Vehicles and Training Equipment*, January 15, 2012.

This technical order outlines the types and scope of depot maintenance support and establishes procedures for programming aerospace vehicles and training equipment for depot maintenance. The provisions are applicable to all Department of Air Force, Air National Guard, and Air Force Reserve Command activities. The AFMC single manager includes program managers and program group managers.

AFMC Resource Management Decision 802, *In-Sourcing Implementation Guidance*, January 2010. not available to the general public.

Language in the National Defense Authorization Act language for FYs 2006 and 2008 requires DoD to consider using its civilian employees to accomplish work previously performed by contractors. AFMC used this authority in the FY APOM and FY 2010 POM cycles to accomplish 800 contract-to-civilian conversions across the command. This document provides specific guidance for achieving contractor reductions and civilian end-strength increases by FY 2015.

Pre-Publication Copy: Not Cleared for Open Publication. Do not cite or quote.

Warner Robins Air Logistics Center, *Concept of Operations for Enterprise-Wide Implementation of Maintenance Requirements Supportability Process (MRSP) to C-5, F-15, and C-130 Product Lines*, March 9, 2012.

This document describes the MRSP process for horizontal integration of the supporting functions of program management, depot maintenance, and supply chain management at WR-ALC in support of high velocity maintenance.

Air Force Material Command, *Organization Change Request for Air Force Materiel Command*, OCR 12-01, February 6, 2012.

This organization change request (OCR) proposes reorganizing Headquarters AFMC to ensure clear lines of responsibility, coordination, and accountability while realigning some of the roles and responsibilities of the directorates to the newly approved lean, mission-based, five-center construct. Thus, the OCR has two primary objectives: (1) specify the roles and responsibilities transferring from headquarters directorates to a lead center (or centers), and (2) specify the missions that these directorates will retain. It is worth mentioning that the approximately 160 positions will be transferred to the centers to resource their "cross-synchronization," and approximately 200 authorizations will be eliminated. This total (approximately 360) represents about a 23-percent reduction in Headquarters AFMC and field operating agency authorizations.

Air Force Material Command, *Organization Change Request for Air Force Materiel Command*, draft, OCR 12-02, March 31, 2012. Not available to the general public.

Updated version of OCR 12-01, described above.

Headquarters Air Force Material Command, Strategic Plans, Programs, and Analysis (AFMC A8/9), *An Overview of Analyses Resulting in the 5-Center Construct for Air Force Materiel Command*, November 14, 2011.

AFMC conducted analyses to assess the implications and consequences associated with various ways of satisfying the OSD mandate levied in RMD 703 to reduce civilian personnel. This document provides more insight into the alternative courses of action considered and assessed as part of that effort. A detailed development of the five-center construct is also provided. It is imperative to stress that the funds associated with these reductions in personnel authorizations and operations and maintenance, were removed from the budget as of October 1, 2011. The Air Force is now fully committed to the "what" (i.e., reduced personnel). The key question is "how" this personnel reduction will be implemented. The five-center construct provides a strategic solution to achieving the mandated civilian personnel reductions through consolidation and reduction of overhead while maintaining the core mission.

Pre-Publication Copy: Not Cleared for Open Publication. Do not cite or quote.

Quinlan, Maureen, Air Force Materiel Command, "Air Force Sustainment Center LG Stand-Up," briefing, February 2012.

This briefing provides a synopsis of planning in the identification of organizational responsibility and office transfers from Headquarters AFMC staff to the AFSC.

Other Related Analyses

National Research Council, Committee on Examination of the U.S. Air Force's Aircraft Sustainment Needs in the Future and Its Strategy to Meet Those Needs, *Examination of the U.S. Air Force's Aircraft Sustainment Needs in the Future and Its Strategy to Meet Those Needs*, Washington, D.C.: National Academies Press, 2011.

This study highlights many sustainment issues and offers recommendations aimed at improving the efficiency and effectiveness of the Air Force weapon system sustainment enterprise. The Air Force weapon system sustainment enterprise consists of a highly skilled workforce but operates without modern enterprise resource planning tools and with a supply chain that is not structured according to business best practices. The sustainment posture is determined by the number and variety of aircraft, the technology of the systems involved, and the global deployment of the fleet. The fleet's diversity, which ranges from aircraft designed and deployed in the 1950s to the world's most advanced high-performance fighters, weighs on the enterprise's operation. The enterprise has become more complex over time, not only because of the fleet's increased growth and diversity but also because of global politics and regulations.

Sustainment activities are undertaken by numerous offices and organizations, including the Office of the Secretary of the Air Force, the Office of the Chief of Staff of the Air Force, AFMC and its subordinate product centers, air logistics centers, and Air Force operational commands. The activities of these offices and organizations must be considered in studies of weapon system sustainment. Sustainment is generally program-specific. Although policy is made by the secretariat and Air Staff offices, it is broad and open to interpretation. The product centers and air logistics centers drive the larger-scale and higher-cost sustainment activities. Because of the broad nature of sustainment policy and the number of organizations involved *there is no "model" weapon system sustainment program*.

Sustainment activities require significant coordination and communication across a myriad of functions and organizations. *At present, this process is largely facilitated by interpersonal relationships rather than clear, concise lines of authority and modern enterprise reporting and planning tools, which results in escalating costs and inefficiencies.*

Extraordinary management effort and attention are required to knock down stovepipes that impede efficiency. Senior officials are consistently frustrated by weak or

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overly broad policies, minimal governance, and unnecessarily complex organizational structures as they try to improve support postures resulting from enterprise inefficiencies. *Systemic shortcomings span the weapon system life cycle—from initial concept development through retirement*—when there is a lack of clear accountability.

The Air Force challenges in the sustainment process begin in the Air Force organizations (i.e., the Office of the Assistant Secretary of the Air Force for Acquisition; the Office of the Assistant Secretary of the Air Force for Installations, Environment, and Logistics; and the Air Staff Headquarters for logistics, installations, and mission support) that are responsible for the clarity of policy and process to the subordinate organizations. These headquarters offices should set the tone for Air Force sustainment. In the absence of well-founded policy and instructions, field-level commanders and directors must take individual action to sustain their fleet; however, they deserve clear guidance and should be held accountable for execution.

Also, as noted by the sustainment community, *the Air Force has not delegated to a single office or command the authority to integrate both early acquisition direction on system sustainment practices or to control sustainment in the years of execution*. The Air Force should consider formally designating a senior commander, such as the AFMC commander, to oversee the entire sustainment process, from concept phase through system retirement, with responsibility to advise the headquarters offices on policy and then train, organize, equip, plan, and execute the Air Force's ILCM processes.

Short- or longer-term effects put the acquisition community and the sustainment community at odds. Compliance with statutes conflicts with the desire to bring weapon system economics into balance and simultaneously support the weapon system at an optimal level. *The committee found that there has been no strong arbitrator for sustainment.* Policies regarding who can influence or reshape sustainment decisions have been unclear, and SPMs and PEOs have decisionmaking authority. Unless an individual of great stature makes a compelling case to the SAE, the decision stands.

Force sustainment policies should establish a systems approach, from concept to retirement, based on the following:

1. engineering-based decisions with regard to the processes used to sustain an organization's operational systems
2. a comprehensive approach to gathering and analyzing data
3. a well-defined governance structure designed to ensure compliance with the directives prescribing the sustainment processes
4. organizational structures optimized and resourced to ensure proper leadership, training, force development, and execution of the sustainment processes
5. a culture of collaboration whereby each of the many acquisition and sustainment functions, processes, and procedures is designed with an understanding of how individual actions affect the entire Air Force warfighting enterprise

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6. *outcome-based metrics designed to ensure the appropriate availability of operational systems to ensure mission success.*

Eckbreth, Alan, and Charles Saff, "Sustaining Air Force Aging Aircraft into the 21st Century," briefing, U.S. Air Force Scientific Advisory Board, August 11, 2011.

Characterizes the future sustainment environment with decreased recapitalization within the Air Force and projected impact on type of work to be performed in the future and those aspects of sustainment support that will be required to do that work. Addresses the idea of being prepared for what is coming in regard to decreased and aging types and numbers of weapon systems.

Christle, Gary E., Dan Davis, and Gene Porter, *Air Force Acquisition: Return to Excellence*, Alexandria, Va.: CNA, February 2009.

A Secretary of the Air Force memorandum, dated July 18, 2008, directed the Assistant Secretary of the Air Force for Acquisition to provide terms of reference for an independent, 90-day assessment of the Air Force acquisition process, identifying specific problem areas and making recommendations for longer-term improvement. The primary findings presented in the report were as follows:

- The Air Force does not value acquisition as a profession.
- The Air Force does not view the equip function as equivalent to the organize and train function.
- Air Force leadership is not focused on acquisition.
- The chain of command does not enforce accountability or process discipline.
- Air Force Leadership is not regularly engaged in reviews of programs.
- The wing/group/squadron structure is inefficient and dysfunctional.
- The requirements development process is seriously flawed.
- There are disconnects between requirements, acquisition, and resource communities and processes.
- There is inadequate stratification of requirements to enable and institutionalize the concept of block acquisition.
- There is very little consistency in the use of processes and the implementation of policies across product centers.
- The breadth and depth of knowledge and experience varies considerably across centers.
- There is limited and ineffective use of key processes.

Pre-Publication Copy: Not Cleared for Open Publication. Do not cite or quote.

LogisticSpecialties, *Sustainment Center LG Construct Overview and Recommendation Plan*, evaluation for Oklahoma City Air Logistics Center Plans and Programs Directorate under contract no. FA8100-12-M-0020, February 18, 2012. Not available to the general public.

This document states that "the responsibility for sustainment of weapon systems will be shared by the Air Force Sustainment Center (AFSC) and the Air Force Life Cycle Management Center (AFLCMC). AFSC will be responsible for supply chain management and depot maintenance. LCMC will be responsible for weapon system and major end item management and engineering. The two centers will share responsibility for sustainment planning across the life cycle."

The analysis team concluded that the proposed logistics organization was well planned but that improvements could be made in defining the mission and refining the organization. Processes that cross centerlines represent a major gap that demands continuing attention. The team made recommendations in the areas of process analysis, organizational construct, and implementation:

> Two notes of caution are warranted in interpreting the results of the evaluation. First, the performance of the Air Force sustainment enterprise depends on a successful collaboration between AFSC and LCMC. Senior leadership of both centers must continue to stay engaged to make the new organization seamless and effective. Second, while we understand the imperative to implement the new structure as soon as possible, we strongly encourage the development of a plan to evolve the organization to its final state.
>
> Five gaps were identified as a result of mapping processes to responsibilities:

- The most critical gap is the absence of processes that map to the responsibility for "AFLCMC interface/planning for Product Support." The "to-be" processes have not been defined. Leadership must ensure that the future responsibilities of AFSC and AFLCMC for sustainment are clearly delineated. A single organization in the AFLCMC should be identified that will take on the role of the chief interface leader for interaction between the two centers. This is a critically important issue that needs further attention.
- The second gap is the role of the Resources Management Division. The evaluation identified the development and oversight of an integrated executable plan that ensures alignment between supply chain planning and depot maintenance as a key mission of the AFSC logistics staff. While the Resources Management Division appears to be the point where these two functions are integrated, its role in developing the supply chain and maintenance integrated executable plan is not clear, and developing such a plan is not identified as a core process of the new AFSC.

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- The third gap is the need to examine process touch points between the AFSC and the Air Staff. Some of the functions currently performed at Headquarters AFMC will be performed by AFSC. In these cases, AFSC will need to communicate with the Air Staff to perform the sustainment mission.
- The fourth gap is the apparent lack of focus on the emerging RNI process. As the new AFMC organizations are created, there is clearly a need to understand how the RNI process will be changed, including the designation of product support managers.
- The final gap is in the area of surge management and OPLAN 70. The air logistic complexes and the supply chain management wings (SCMWs) will be responsible for executing wartime surges, but enterprise-level planning should be the responsibility of AFSC.

U.S. Army, *Army Strong: Equipped, Trained and Ready, Final Report of the 2010 Army Acquisition Review*, January 2011.

This review calls for the Army to pursue the following goals:

- Realign, resource, and focus its requirements and acquisition professionals on their raison d'être and associated core competencies (i.e., U.S. Army Training and Doctrine Command's timely delivery of requirements, PEO and program manager delivery of products meeting the requirement on cost and on schedule, and preparing the Army staffs that are accountable for meeting the requirement).
- U.S. Army Materiel Command Life Cycle Management Centers should be responsible for post-fielding operational logistics. The Army needs to remove confusion regarding the mission and clarify the centers' role in life-cycle logistics vis-à-vis program managers. Program managers should be responsible for acquisition logistics during development and through successful initial operational capability. Operational logistics subject-matter experts from the appropriate centers should be part of the program manager's office during development to ensure that the system is designed properly to reduce eventual sustainment costs (e.g., reliability, increased mean-time-between-failure). *PEOs and program managers were created principally to bring professionalism to the development, qualification, production, and fielding of military systems and to improve cost, schedule, and performance. They should be refocused on this role.* Asking them to also be operational sustainment experts is mission creep and a diversion of their management attention away from their primary responsibilities.
- Every program managers and PEO interviewed knew their mission, clearly understood their responsibilities, and was focused on meeting cost, schedule, and performance thresholds—including immediate responsiveness to warfighters' readiness needs. *Program managers have assumed many of the centers' post-fielding logistics responsibilities, blurring accountability.*

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- Involve all stakeholders collaboratively in requirements development, development planning, and acquisition solicitation, rather than just critiquing others.
- Realistically assess and manage risk, and follow more tailored evolutionary acquisition strategies with associated reductions in steps, time, and documentation for new systems.
- Improve the number, quality, and accountability of the personnel essential to the acquisition of equipment and systems.

Business Executives for National Security, *Getting to Best: Reforming the Defense Acquisition Enterprise*, July 2009.

The Business Executives for National Security task force on defense acquisition law and oversight concluded that the process—but not the product as delivered to the warfighter—has become the principal focus of the acquisition system. Specific problems include requirements creep, funding instability, poor initial cost estimating, immature technology, and a lack of flexibility to solve problems. These are compounded by the fact that many individuals with little or no accountability can profoundly affect funding, schedule, personnel assignments, and administrative demands. Too often, the problems that result are not uncovered until operational testing is under way—an activity that frequently overlaps with the production tooling effort, thereby increasing the cost to correct deficiencies. There are three overarching categories of shortcomings.

Linkages between the requirements determination, budgeting and acquisition processes. Today's requirements process is a highly formalized pursuit driven by the perceived needs of warfighters and accommodated by engineers in which the suppliers of financial resources are not consulted. *According to the task force, it must become an iterative process involving warfighters who understand the nature of combat, engineers who understand the limits of technology, and financial experts who can accurately estimate costs and assess the consequences for future budget scenarios.* The principal shortcomings of the existing requirements process are that it does not couple needs for specific future systems into an overall national defense strategy and that requirements are largely determined by the military services without realistic input as to what is technically feasible from an engineering perspective and without adequate input as to what is affordable from a planning, programming, and budgeting perspective. As a result, performance overshadows cost, and affordability is rarely considered at all. It is important that the combatant commanders, who are indeed the ultimate capability users of the products of the acquisition process, have a central role in requirements definition. However, they are heavily focused on current operations, particularly in wartime, and in general do not possess the necessary systems engineering enterprises, future technology assessment capabilities, or cost analysis expertise. *Thus, there is a need to strike a balance between the short-term capabilities where the combatant commanders' views should be preeminent and long-term force-shaping developments, which can be achieved most responsibly under the guidance of those with enduring institutional responsibilities: the service chiefs.*

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Constraints to defense acquisition workforce excellence. Today, the government too often finds itself with minimally experienced and transient individuals leading major acquisition programs, able to attract new people only after long delays, unable to couple rewards with performance, and with many senior positions simply unoccupied. Talented and dedicated people can often overcome a poor organizational structure, but a good organizational structure cannot overcome inadequate performance. When qualified people are combined with sound organizations and practices, success is virtually assured. The acquisition process, unlike most government pursuits, is a business function. It demands skills and talents that are far more common to the business world than to government and military operations.

Today's acquisition workforce is highly competent in many areas, but it is understaffed relative to its workload. It is also organizationally misaligned and thus challenged to feel appreciated as a professional component, and it faces an unprecedented loss of expertise due to aging and the pull of private-sector opportunities. Fixing workforce problems is a leadership issue far more than a process issue. In this regard, the Packard Commission stated that the acquisition leadership should have "a solid industrial background." Unfortunately, individuals with such backgrounds cannot—or will not—accept positions in the government acquisition process. Restoring the acquisition workforce to excellence requires, above all, the right people. There are many good people in the system, but that does not make them the right people. The bottom line for the acquisition enterprise is to recognize and reconstitute a professional acquisition workforce working side by side with its contractor support and, most importantly, its operational counterparts.

Adherence to program execution processes aimed at satisfying the needs of the warfighter. Today, programs are often started without the resources needed to address contingencies and with unproven technology, poor estimates of production volumes, and no funding flexibility—and they are also revised frequently. Programs should not be initiated until (1) the requirement is clear; (2) funding, including adequate reserves, is available; (3) the technology is proven; and (4) the system concept is well defined. It should be difficult to start new programs, and it should be difficult to change or stop them, once started, absent truly compelling reasons. Failure to respect the latter has historically led to large sums of money wasted on half-completed programs so as to chase new opportunities.

Significant recommendations included the following:

- Assign to the service chiefs responsibility for establishing, managing, and maintaining a highly competent acquisition workforce, including education, training, career path development, and succession planning. The latter is rarely done today in any institutional fashion. Appropriate staffing standards should be created for all critical positions.

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- Amend Goldwater–Nichols to reinstate the service chiefs in the chain of responsibility for executive management of acquisition programs and over the PEOs and program managers. Program managers are the heart of the defense acquisition process and should be granted commensurate authority. They should be required to have corresponding training and experience. Career paths should be established that permit program managers and other key personnel to remain in their positions from at least one major milestone to the succeeding major milestone. Service in the acquisition process must not damage a military career. This move would reconsolidate the service chiefs' control over both resource allocation (which they already possess) and the acquisition processes; it will also help reestablish a more attractive career progression path for officers in the acquisition career field and go a long way toward restoring the professionalism of the career field, putting it on par with the operational side of the services. The service secretaries would continue their oversight through the service chiefs.

Fox, J. Ronald, with David G. Allen, Thomas C. Lassman, Walton S. Moody, and Philip L. Shiman, *Defense Acquisition Reform, 1960–2009: An Elusive Goal*, Washington, D.C.: U.S. Army Center Of Military History, 2011.

This volume presents a valuable historical analysis of the numerous attempts over the past 50 years to reform the defense acquisition process for major weapon systems. It identifies important long-term trends, insights, and observations that provide perspective and context to assist defense decisionmakers, acquisition officials, and the acquisition schoolhouse. It is an important work on an important subject that continues to defy solution.

Comptroller General's Forum, *High-Performing Organizations: Metrics, Means, and Mechanisms for Achieving High Performance in the 21st Century Public Management Environment*, Washington, D.C.: U.S. Government Accountability Office, GAO-04-343SP, February 2004.

In summary, at this forum, there was broad agreement among the participants on the key characteristics and capabilities of high-performing organizations, which can be categorized according to four themes:

- *A clear, well-articulated, and compelling mission.* High-performing organizations have a clear, well-articulated, and compelling mission, along with the strategic goals to achieve it and a performance management system that aligns with these goals to show employees how their performance can contribute to overall organizational results. With these elements in place, regularly communicating a clear and consistent message about the importance of fulfilling the mission helps engage employees, clients, customers, partners, and other stakeholders in achieving higher performance.

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- *Strategic use of partnerships.* Since the federal government is increasingly reliant on partners to achieve its outcomes, becoming a high-performing organization requires that federal agencies effectively manage relationships with other organizations outside of their direct control.
- *Focus on the needs of clients and customers.* Serving the needs of clients and customers involves identifying their needs, striving to meet them, measuring performance, and publicly reporting on progress to help ensure appropriate levels of transparency and accountability.
- *Strategic management of people.* Most high-performing organizations have strong, charismatic, visionary, and sustained leadership; the capability to identify the skills and competencies that employees and the organization need; and other key characteristics, including effective recruiting, comprehensive training and development, retention of high-performing employees, and a streamlined hiring process.

Locher III, James R., "Taking Stock of Goldwater-Nichols," *Joint Force Quarterly*, Autumn 1996, pp. 10–17.

The principal architect of the Goldwater-Nichols reviews the law ten years after its enactment.

Pinney, Charles W., "The USAF PEO/DAC/MAD Structure: Successful Pattern For Future Weapon System Acquisition?" *Acquisition Quarterly*, Winter 1999, pp. 21–46.

The acquisition-streamlining initiatives of the late 1980s saw the creation of the PEO to oversee the execution of a portfolio of related major programs. This officer, in the direct reporting chain between the program manager and the SAE, has improved and focused program oversight and execution. But the imposed insertion of this position into the existing Air Force acquisition structure has complicated the roles and responsibilities with other acquisition officials—specifically, the mission-area directors and the designated acquisition commanders—and has had mixed results.

The new system effectively took the major command (MAJCOM) out of the program management chain; the MAJCOM focus is on processes and resource management. The staff is less involved in program management oversight, and its role is to support the acquisition process and provide the funding and human resources that the program manager needs to execute a given program.

Pre-Publication Copy: Not Cleared for Open Publication. Do not cite or quote.

"In Step with Lt Gen Tom Owen: Making Things Better," *Exceptional Release Magazine*, Winter 2011.

This profile reviews the latest efforts by Lt Gen Tom Owen to enhance acquisition performance through the use of high velocity acquisition and a series of internal aerospace systems centers acquisition performance metrics.

"Special Issue: Product Support," *Defense AT&L Magazine*, March–April 2012.

An issue of this journal specifically focused on the product support business model, PSMs, product support agreements, product support integrators, and product support providers. It provides detailed information on the system of product support.

Academic Literature

Kent, Glenn A., *A Framework for Defense Planning*, Santa Monica, Calif.: RAND Corporation, R-3721-AF/OSD, 1989, http://www.rand.org/pubs/reports/R3721.html.

This report details the framework for strategies-to-tasks analysis developed by RAND for use in orchestrating the activities associated with defense planning in general and force planning in particular. The core theme is the emphasis on a framework that leads to prompt and purposeful action, rather than a system that emphasizes preparing and approving documents over the substance of the goals being pursued.

Tripp, Robert S., Kristin F. Lynch, Charles Robert Roll, Jr., John G. Drew, and Patrick Mills, *A Framework for Enhancing Airlift Planning and Execution Capabilities With the Joint Expeditionary Movement System*, Santa Monica, Calif.: RAND Corporation, MG-337-AF, 2006, http://www.rand.org/pubs/monographs/MG377.html.

This RAND report demonstrates the practical use of strategies-to-task analysis when examining a complex system—that is, airlift planning and execution.

Lewis, Leslie, James A. Coggin, and Charles Robert Roll, Jr., *The United States Special Operations Command Resource Management Process: An Application of the Strategy-to-Tasks Framework*, Santa Monica, Calif.: RAND Corporation, MR-445-A/SOCOM, 1994, http://www.rand.org/pubs/monograph_reports/MR445.html.

This RAND report provides an additional practical example of using strategies-to-task analysis.

Pre-Publication Copy: Not Cleared for Open Publication. Do not cite or quote.

Masters, James M., et al., *Enterprise Posture Planning: Strategic Insights to Shape the Future of Weapon System Support*, draft, Santa Monica, Calif.: RAND Corporation, forthcoming.

This draft report explains the Transactional Cost Analysis model and ways to integrate a number of critical cost determinants to develop an enterprise sustainment strategy.

Tripp, Robert S., Kristin F. Lynch, and John G. Drew, *Improving Air Force Command and Control Through Enhanced Agile Combat Support Planning, Execution, Monitoring, and Control Processes*, Santa Monica, Calif.: RAND Corporation, MG-1070-AF, forthcoming.

This report examines agile combat support process gaps and recommends implementation strategies to facilitate the changes needed to improve Air Force C2 through agile combat support, planning, execution, monitoring, and control processes.

Leonard, Robert S., and John C. Graser, *Weapon System Cost Growth in the New Century: Is It Increasing?* draft, Santa Monica, Calif.: RAND Corporation, August 2011.

This draft RAND report presents an analysis of weapon system cost growth factors and trends, offering comparisons between the services. All the services are experiencing an increased frequency of extreme cost growth in their continuing programs in comparison to those that are now complete. The Navy generally has the lowest incidence of extreme cost growth, while continuing Air Force programs have the highest (or are tied for the highest) incidence across all measures. Fully one-third of continuing Air Force and Army programs exhibit extreme cost growth.

Schrader, John Y., Leslie Lewis, William Schwabe, Charles Robert Roll, Jr., and Ralph Suarez, *USFK Strategy-to-Task Resource Management: A Framework for Resource Decisionmaking*, Santa Monica, Calif.: RAND Corporation, MR-654-USFK, 1996, http://www.rand.org/pubs/monograph_reports/MR654.html.

This report describes the application of a discipline called strategy-to-tasks resource management to the command responsible for defending the Republic of Korea. It shows how the discipline can be applied in a structured, pragmatic, and useful manner to link specific tasks in order to fulfill strategic intent. It also demonstrates one of the ways in which the AFMC reorganization analysis was accomplished.

Pre-Publication Copy: Not Cleared for Open Publication. Do not cite or quote.

Nemfakos, Charles, Irv Blickstein, Aine Seitz McCarthy, and Jerry M. Sollinger, *The Perfect Storm: The Goldwater-Nichols Act and Its Effect on Navy Acquisition*, Santa Monica, Calif.: RAND Corporation, OP-308-NAVY, 2010, http://www.rand.org/pubs/occasional_papers/OP308.html.

This paper focuses on the implementation of the Goldwater-Nichols Act in the Department of the Navy and on related acquisition reforms. It also profiles U.S. Army and U.S. Air Force acquisition organizations before and after Goldwater-Nichols.

Notably, as the authors point out,

> Instructions [SECNAV] after 1991 also elaborated on the responsibility of the Systems Commanders would exercise authority of the acquisition executive to supervise acquisition programs directly and, notably, would report to the CNO for execution of programs that *were not* development or acquisition projects.

During the conference leading up to the enactment of Goldwater-Nichols, Senator Nunn stated that he had been "concerned that we not create an impenetrable wall between the staffs of the Service Secretary and the Service Chief." In interviews with senior Navy and OSD officials directly involved with implementing Goldwater-Nichols, the RAND team found that most of these officials came to share this concern, beginning either when the act was passed or later. *In fact, of the 25 former and current civilian and uniformed officials interviewed for the project (including those in the Air Force and the Army), all but two had no doubt that a wall had been built between operational officers and acquisition officials.*

Despite the good intentions of acquisition reform, performance has continued to decline, and there have been concomitant slips in schedule, cost overruns, and workforce deterioration.

FIne, Charles H., *Clockspeed: Winning Industry Control in the Age of Temporary Advantage*, Reading, MASS.: PERSEUS BOOKS, 1998.

Based on research conducted at Massachusetts Institute of Technology, this book shows how applying the principles of genetics to conceptualize supply chain choices can be an effective method for decisionmaking and identifying choices in supply chain design, processes, and organizational innovations.

Locher, James R. III, *Victory on the Potomac: The Goldwater-Nichols Act Unifies the Pentagon*, College Station, Tex.: Texas A&M University Press, 2002.

This volume presents a history of the staffing, development, and passage of the Goldwater Nichols Defense Reorganization Act of 1986.

Pre-Publication Copy: Not Cleared for Open Publication. Do not cite or quote.

Simon, Herbert A., *Administrative Behavior*, 4th ed., New York: The Free Press, 1997.

The author, winner of the Nobel Prize in economics, discusses organizational theory—specifically how the roles of organization members are shaped by the goals with which they identify. These goal identifications, in turn, depend heavily on location in the organization and the pattern of organizational communication. The "principles of organization" have been relativized by a stream of criticism, and empirical research that has shown that different organizational designs are needed for different functions in different environments.

Bowman, Edward H., and Bruce M. Kogut, *Redesigning the Firm*, New York: Oxford University Press, 1995.

This book presents a wide range of insights into organizational redesign that may allow firms to compete into the 21st century, concentrating on how changes in the market and the competitive environment are forcing changes in the capabilities of firms. Speed, variety, quality, and service have emerged as vital factors. These are organizational capabilities that resulted from a long-term historical evolution. The authors formulate principles by which managers and workers organize to generate new capabilities.

Von Bertalanffy, Ludwig, *General Systems Theory: Foundations, Development, Applications*, rev. ed., New York: George Braziller, 1969.

This work describes general systems theory, the study of "systems of systems" in a complex and interrelated manner. Essentially borrowing precepts from a variety of physically mechanistic and biological process systems, general systems theory attempts to develop a complex and grander theory of systems. Sense, feedback, respond, and control, among other features, are brought together in an effort to describe organization functions and structure.

Williamson, Oliver E., and Sidney G. Winter, eds., *The Nature of the Firm: Origins, Evolution, and Development*, New York: Oxford University Press, 1993.

This work, which includes R. H. Coase's 1991 Nobel Prize–winning lecture, "The Institutional Structure of Production," addresses the theory of transactional cost analysis (TCA), which suggests that a firm is developed for the purposes of production when the cost of participating in the market is greater than the cost of production within the firm itself. Coase, who founded the field of TCA theory, studied the characteristics of successful firms, focusing on what they chose to produce internally and what they chose to contract out. He found that successful firms make outsourcing decisions based on two costs: direct costs and governance costs. Direct costs, "the costs you see," include the price paid for raw materials and labor. Governance costs are driven by how a set of activities is performed and include research, bid development, quality

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assurance, and other costs that an organization would incur when sourcing a service. Governance decisions are driven by several key criteria (e.g., frequency of need, asset specificity, risk, uncertainty) and can play a large role in the overall costs of production. Using TCA allows the firm to compare transaction costs under different governance structures. In a military environment, an inherently governmental task is either direct warfighting or one in which the sensitive nature of the task would require it to be completed by an official of a government entity. Transaction cost economics can be applied to an organizational construct decision process by considering the governance structure of support options and the transactions that occur both within and outside of DoD, in combination with the critical dimensions of such transactions.

Beer, Stafford, *Decision and Control: The Meaning of Operational Research and Management Cybernetics*, New York: Wiley, 1966.

This book delves into cybernetics theory as it would apply to management and details the application of science to the process of management. The foundation is that decisionmaking is best described as the fixing of a belief. The ways in which the belief is actually fixed are shown to be based on mechanisms derived from biological necessity, not from intellectual processes. They result in decisions that have more to do with learning to survive than with the objective analysis of profitability. Throughout this work, this theory is framed and presented through industrial management examples.

Seborg, Dale E., Thomas F. Edgar, and Duncan A. Mellichamp, *Process Dynamics and Control*, 2nd ed., New York: John Wiley and Sons, 2004

This publication examines *process control theory*, including the concepts of dynamics, feedback, and stability as important aspects for understanding many complex systems. It emphasizes dynamic behavior, physical and empirical modeling, computer simulation, measurement and control technology, basic control concepts, and advanced control strategies. Focused on the chemical industry, it shows how the theory is applied in practice.

Hammer, Michael, and James Champy, *Reengineering The Corporation: A Manifesto For Business Revolution*, rev. ed., New York: HarperCollins Publishers, 2001

This seminal work on business process reengineering details how dramatic performance improvements can be achieved by redesigning business processes, organization, and culture. The authors define reengineering as the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed.

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APPENDIX D

Interview List for the AFMC Reorganization Analysis

Air Force Stakeholders

Assistant Secretary of the Air Force for Acquisition (SAF/AQ)

Deputy Assistant Secretary of the Air Force for Acquisition Integration (SAF/AQX)

Assistant Secretary of the Air Force for Installations, Environment, and Logistics (SAF/IE)

Deputy Assistant Secretary of the Air Force for Logistics (SAF/IEL)

Director of Operations, Office of the Deputy Chief of Staff for Operations, Plans, and Requirements, Headquarters U.S. Air Force (AF/A3O)

Deputy Chief of Staff for Logistics, Installations, and Mission Support, Headquarters U.S. Air Force (AF/A4/7)

Director of Logistics, Office of the Deputy Chief of Staff for Logistics, Installations, and Mission Support, Headquarters U.S. Air Force (AF/A4L)

Director of Plans and Programs, Air Mobility Command (AMC/A5/8)

Vice Commander, Air Force Materiel Command (AFMC/CV)

Strategic Plans, Programs, and Analysis Directorate, Air Force Materiel Command (AFMC/A8/9)

Commander, Aeronautical Systems Center (ASC/CC)

Commander, Electronic Systems Center (ESC/CC)

Commander, Air Armament Center (AAC/CC)

Commander, Oklahoma City Air Logistics Center (OC-ALC/CC)

Commander, Ogden Air Logistics Center (OO-ALC/CC)

Commander, Warner Robins Air Logistics Center (WR-ALC/CC)

Nine program executive officers and several system program managers

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Interested Parties

Gen (ret.) Bruce Carlson

Lt Gen (ret.) Charles Johnson

Lt Gen (ret.) Robert Raggio

Lt Gen (ret.) Richard Reynolds

Lt Gen (ret.) Michael Zettler

Maj Gen (ret.) Pat Condon

Maj Gen (ret.) Richard Goddard

Maj Gen (ret.) Kevin Sullivan

Maj Gen (ret.) Ron Smith

Robert Conner

George Falldine

House Armed Service Committee and Senate Armed Services Committee staffs

The RAND team spoke with each of the stakeholders listed here. Participants identified opportunities and concerns associated with the reorganization. The opportunities and concerns are addressed in the body of this report. Participants' concerns fell into five overarching categories: reorganization motivation and process, leadership and workforce development for both military and civilian personnel, PEO workload, business processes, and warfighter support. As AFMC implements its new organizational structure, it should pay careful attention to issues in these areas.

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APPENDIX E

Civilian Pay Calculations

AFI 65-503, *U.S. Air Force Cost and Planning Factors*, includes a table of civilian standard composite pay rates for FY 2011 (Table A26-1) that shows pay rates for general schedule (GS-1 through GS-15) and "Y-class" (National Security Personnel System) pay levels. GG (general schedule, excepted service) pay tables are equivalent to the GS scale. The IA pay scale, as explained earlier, is used in the Defense Civilian Intelligence Personnel System.

For the analysis in this report, we assumed that IA3 salary is equivalent to that of a GS-11 and used the average of GS-13 and GS-14 salaries for pay grade IA4. Since the SES level is not given in the UMD, we used the GS-15 pay for the SES positions. For the "grade unspecified" positions (labeled "TBD" and "Blank" in the Table D.2), we assumed that pay was the average pay for all other positions. Table E.1 shows the pay table used for these calculations. Table E.2 includes a more detailed table of the positions in each pay grade.

Table E.1
Selected Civilian Composite Pay Rates, 2009–2011

	Composite Pay Rate ($)		
Grade	**2009**	**2010**	**2011**
GS-1	31,228	31,795	32,563
GS-2	40,341	41,073	42,066
GS-3	37,978	38,668	39,602
GS-4	47,674	48,539	49,712
GS-5	51,185	52,114	53,373
GS-6	55,918	56,933	58,309
GS-7	59,156	60,230	61,685
GS-8	63,965	65,127	66,700
GS-9	67,183	68,402	70,055

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Table E.1—Continued

	Composite Pay Rate ($)		
Grade	**2009**	**2010**	**2011**
GS-10	71,902	73,207	74,975
GS-11	75,078	76,441	78,287
GS-12	80,121	81,575	83,546
GS/GM-13	126,895	129,199	132,320
GS/GM-14	153,679	156,468	160,248
GS/GM-15	190,643	194,104	198,793
ES-00	184,151	198,810	197,771
YA-01	61,779	66,697	66,348
YA-02	92,160	99,496	98,976
YA-03	149,314	161,199	160,358
YB-01	44,888	48,461	48,208
YB-02	59,699	64,451	64,115
YB-03	88,969	96,051	95,549
YC-01	65,836	71,076	70,705
YC-02	112,388	121,334	120,700
YC-03	161,313	174,154	173,244
YD-01	72,069	77,806	77,399
YD-02	109,310	118,011	117,394
YD-03	154,685	166,998	166,126

SOURCE: AFI 65-504, Table A26-1.

Table E.2
Savings from Cuts, by Grade (FY 2011 $)

Grade	Count	Composite Pay Rate	Total Savings
GG-07	1	61,685	61,684
GG-11	3	78,287	234,861
GG-12	4	83,546	334,184
GG-13	7	132,320	926,239
GG-14	3	160,248	480,744
GS-05	5	53,373	266,865

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Table E.2—Continued

Grade	Count	Composite Pay Rate	Total Savings
GS-06	17	58,309	991,249
GS-07	55	61,685	3,392,660
GS-08	5	66,700	333,499
GS-09	41	70,055	2,872,253
GS-10	1	74,975	74,975
GS-11	93	78,287	7,280,718
GS-12	338	83,546	28,238,609
GS-13	245	132,320	32,418,390
GS-14	75	160,248	12,018,610
GS-15	30	198,793	5,963,785
IA-03	5	78,287	391,436
IA-04	16	146,284	2,340,544
SES	4	198,793	795,171
TBD	9	104,044	936,396
YA-01	2	66,348	132,696
YA-02	48	98,976	4,750,869
YA-03	2	160,358	320,715
YB-01	12	48,208	578,496
YB-02	10	64,115	641,145
YC-02	11	120,700	1,327,702
YC-03	3	173,244	519,733
YD-02	3	117,394	352,183
YD-03	1	166,126	166,125
Blank	2	104,044	208,088
Total	1,051		109,350,642

NOTE: There are 1,040 positions whose grades are identified. Total pay for these positions is $108,206,154, so the average pay is $104,044. This value was used for the pay for the grade unspecified and blank positions. The total is slightly higher than the sum of the row values because of rounding. The "TBD" and "Blank" positions were rolled together as "grade unspecified" in Chapter Two.

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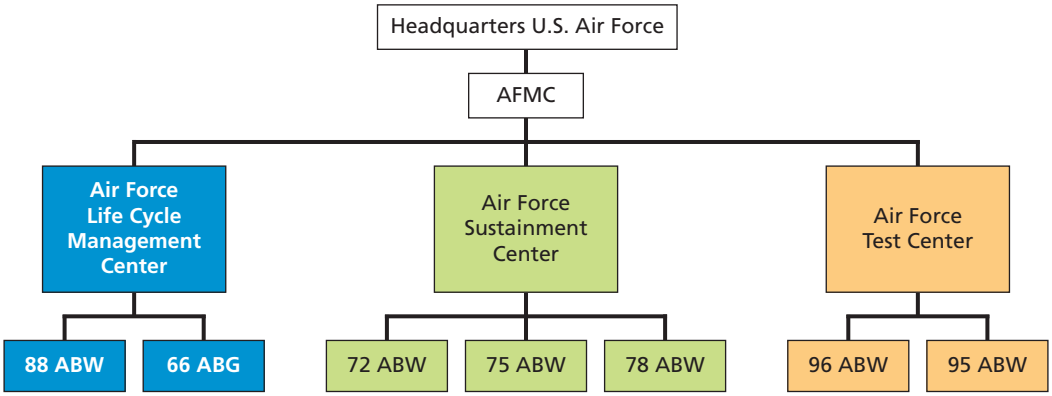
APPENDIX F

Special Interest Topic: Further Consolidate Mission-Area Support

While assessing AFMC's proposed reorganization in the body of this monograph, we limited the scope of the analysis to only those parts of the reorganization that affect product development and operations support. Other aspects of the proposed reorganization such as ABW reporting, were outside the scope of our study but may offer opportunities to improve AFMC's mission-area focus on product development/support-system design and operations support. In this appendix, we propose an organizational structure in which all AFMC ABW functions report to a single organization that we call the Mission Support Center (MSC).

The proposed reorganization within AFMC is a first step toward creating an MSC by consolidating ABW reporting in each of the new centers. Under the old construct, each base had its own base operating support (BOS) function. Under the new construct, those functions are centralized under the five centers (see Figure F.1).

Figure F.1
Proposed Reorganization Consolidates ABW Reporting



NOTE: The figure does not include AFNWC and AFRL because they were not within the scope of this analysis. However, AFTC is included to indicate that this option is not limited to AFLCMC and AFSC. ABG = air base group.

RAND *MG1219-F.1*

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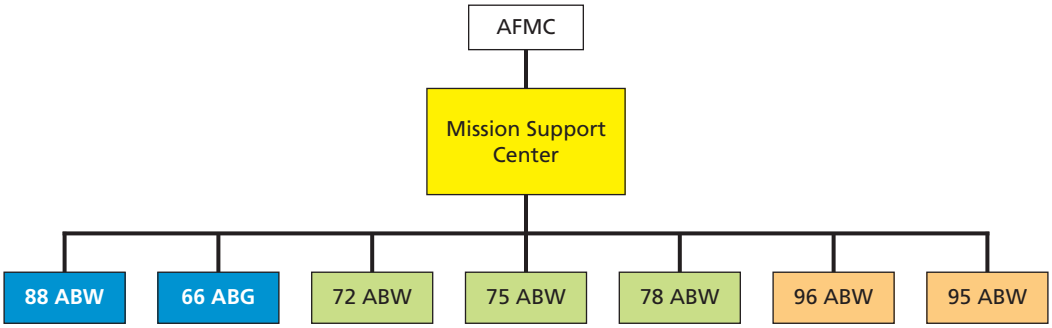
We propose further consolidation by creating an MSC within AFMC to focus on BOS functions for all AFMC bases (see Figure F.2). This further consolidation of like mission areas would remove the ABW supervisory function, allowing the centers in the new organizational construct to fully focus on their primary mission.

We further suggest that this model could extend beyond AFMC. As discussed in the context of Option 4 in Chapter Five, recent RAND analyses on improving Air Force C2 through enhanced processes for ACS identified the need for an *installations manager* to assess capabilities to open and sustain contingency operating locations across AORs and reallocate resources to support operating locations requirements in accordance with the priorities of the Secretary of Defense.[1] This research found that an installations support manager could be responsible for maintaining home-station installations support needed to meet operational organize, train, and equip needs and for developing deployable packages needed to open and sustain forward operating locations. This manager would also be responsible for balancing ACS installations functions.[2] A MSC could perform these functions for the Air Force.

In addition, the SECAF appointed AFMC as the ACS core function lead integrator (CFLI) responsible for ACS Master Plan and program objective memorandum submission. Currently, AFMC only has partial responsibility for determining ACS requirements. ACS personnel requirements are split among the core capability

Figure F.2
Creating a Mission Support Center by Expanding the Proposed Reorganization



NOTE: The figure does not include AFNWC and AFRL because they were not within the scope of this analysis. However, AFTC is included to show how the concept could be extended beyond the AFLCMC and the AFSC.

RAND *MG1219-F.2*

[1] Kristin F. Lynch et al., *Implementation Actions for Improving Air Force Command and Control Through Enhanced Agile Combat Support Planning, Execution, Monitoring, and Control Processes*, draft, Santa Monica, Calif.: RAND Corporation, forthcoming.

[2] The Global Base Support initiative at AFMC is supposed to standardize many core base operating support functions like civil engineering and communications. Although not designed as an installation support manager, perhaps Global Base Support could play a role in this function.

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leads (for example, Global Strike; Intelligence, Surveillance, and Reconnaissance), the MAJCOMs (for BOS), and AFMC (for depot purchased equipment maintenance), but AFMC is responsible for all ACS materiel requirements. No single organization has the authority to integrate and balance ACS expeditionary requirements. If an organization were to assume a directive role, RAND analyses show that reposturing ACS could meet defense guidance requirements at lower costs.[3]

ACS requirements should be determined by identifying contingency needs and then determining how to posture those forces at the home station. Currently, most ACS functional manpower is earned to support organize, train, and equip home-station requirements. Those earned requirements are grouped into unit task codes and then used to determine expeditionary capability. To reposture ACS resources and rebalance functional skills (for example, security forces, communications) would require a line organization and involve all components—rebalancing within each active duty component, the reserve component, and the civilian workforce. Currently, the Vice Chief of the Air Force is the lowest-ranking leader with directive authority over all ACS. An installations support manager or an MSC could assume these responsibilities both managing the ACS resources and balancing ACS forces for future contingency and home-station requirements while informing CFLI processes.

Within AFMC, the MSC would become an important C2 node for operating location support (like the AFSC for supply chain operations). The MSC commander could be dual-hatted as AFMC A6/7 and the MSC staff could consist of the current AFMC/A6/7 staff and the A8/9 ACS CFLI team. There would be some manpower savings from consolidating BOS functions under one center, but there would also be resource requirements to create a new center staff.[4] Extending beyond AFMC, the MSC or a separate MAJCOM could oversee all ABW operations for the Air Force.

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[3] Patrick Mills, *Re-Posturing ACS Resources Can Increase Capability While Reducing Costs*, unpublished RAND research, February 28, 2012.

[4] The manpower implications of this option need be further examined to determine the savings or costs associated with it.

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