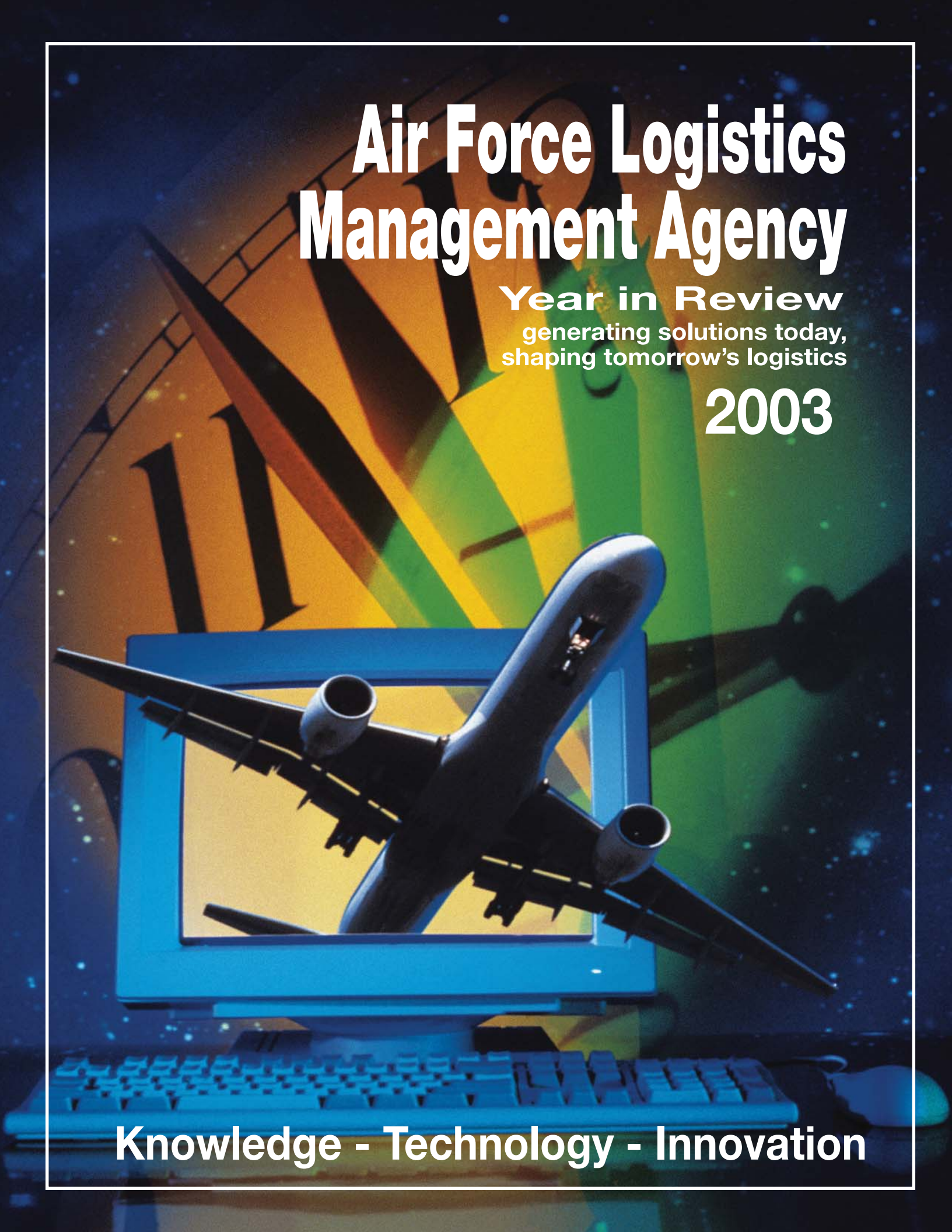
Air Force Logistics Management Agency

Year in Review

generating solutions today,
shaping tomorrow's logistics

2003



Knowledge - Technology - Innovation

AFLMA
Year in Review

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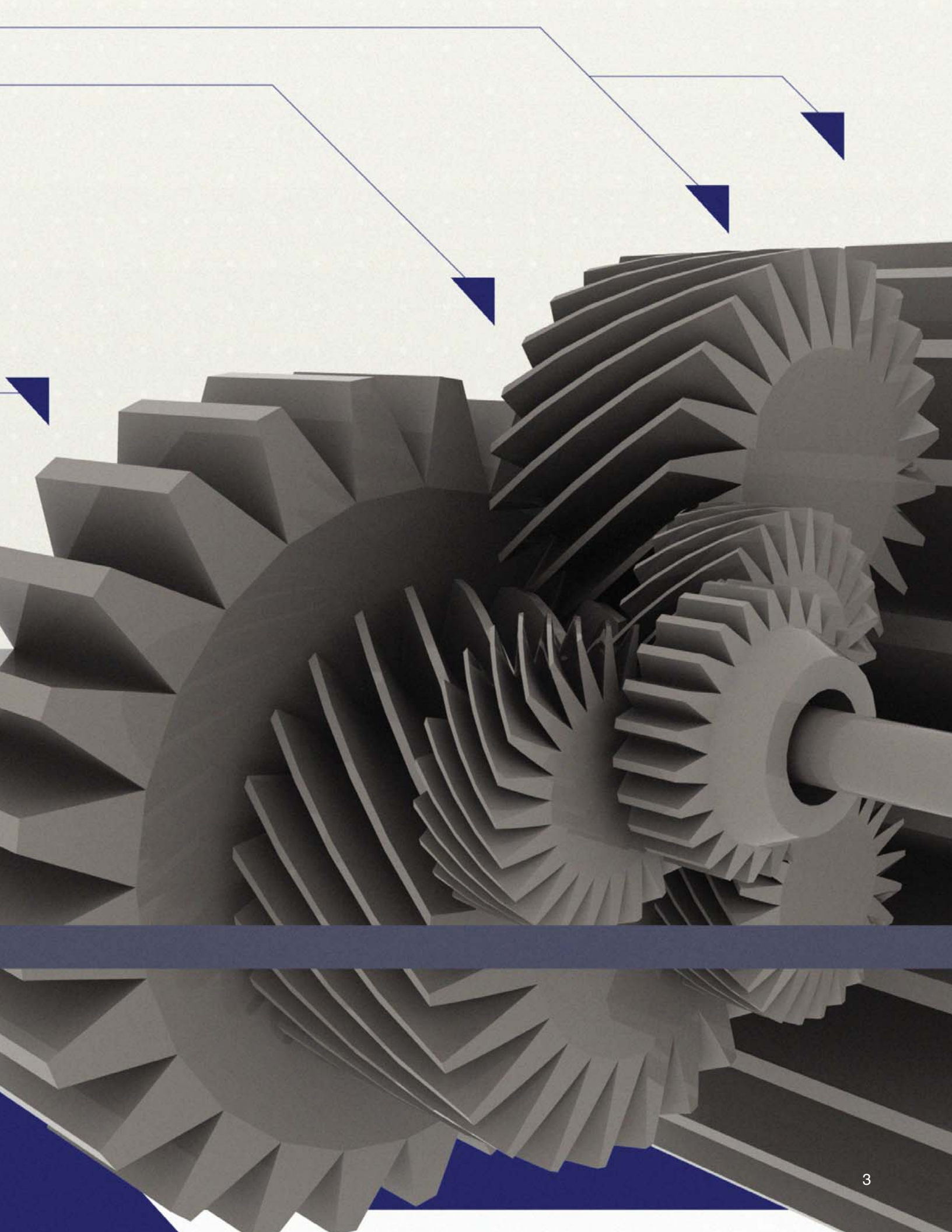
Knowledge - Technology - Innovation



departments

AFLMA

2003 in Review, January 2004

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8 Knowledge, Technology, Innovation! Our Continuing Commitment

12 Who Are We? Your Logistics Studies and Analysis Connection

16 The Results

22 Where We're Going

38 Partnerships: The Right Team

42 Answers: What You Need, When You Need It

120 Books and Monographs: Products with Style and Impact

172 Agency Personnel

176 Project Focus: Active Projects

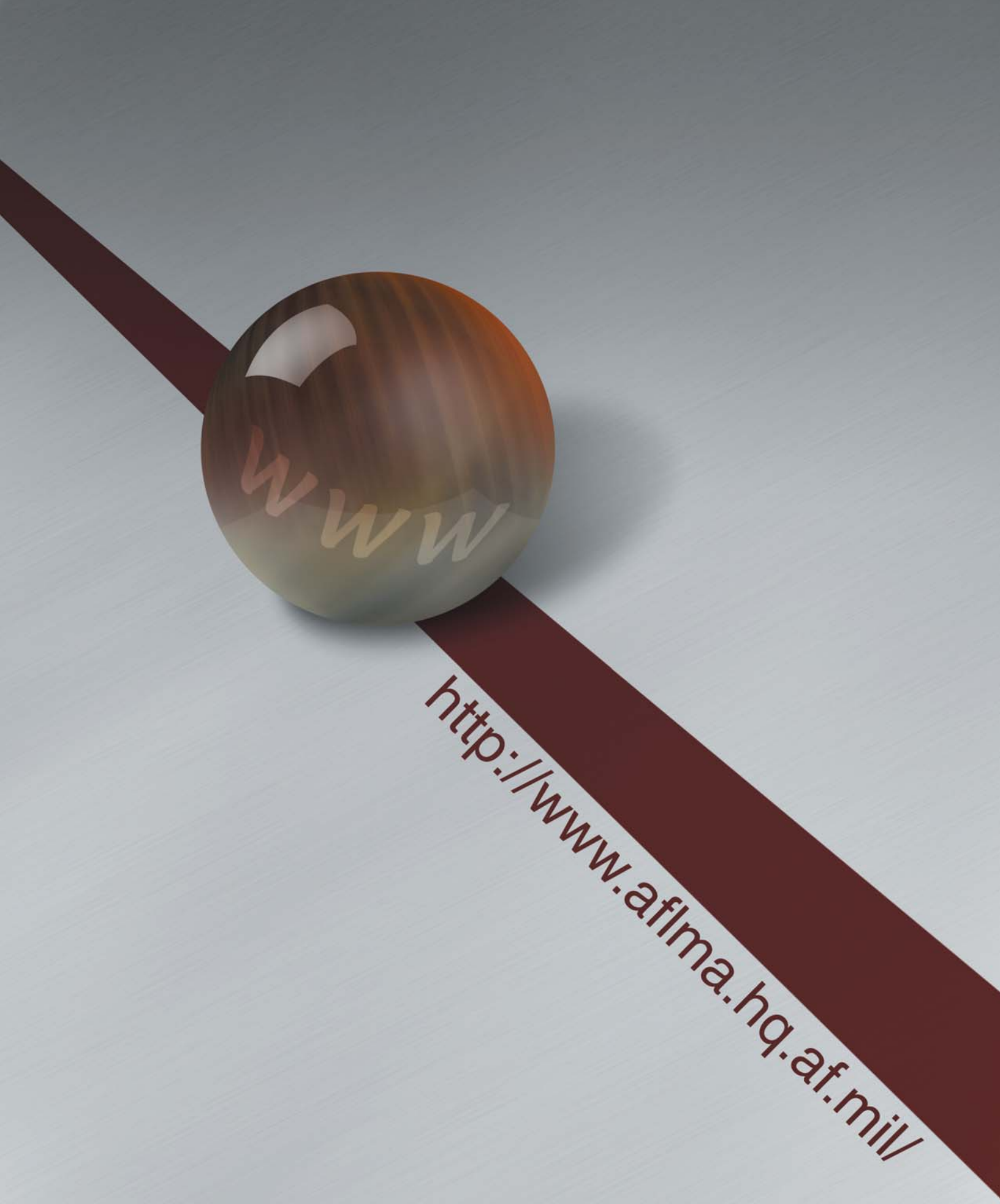
240 AFLMA Facts at a Glance

244 AFLMA News Notes

246 AFLMA Focus 2003: Annual and Quarterly Awards

248 *Journal* Quick Reference

250 Business with the AFLMA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http://www.aflma.hq.af.mil/

Routine has its reasons.

Change isn't one.

Generating solutions today, shaping tomorrow's logistics

Our efforts and partnerships are turning expeditionary airpower support concepts into real-world capability. Further, our work is making dramatic improvements to the Air Force supply system, and our leadership in planning is making logistics play in wargames, simulations, and exercises truly meaningful.

AFLMA

Your Logistics Studies and Analysis Connection

features

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2003 in Review, January 2004

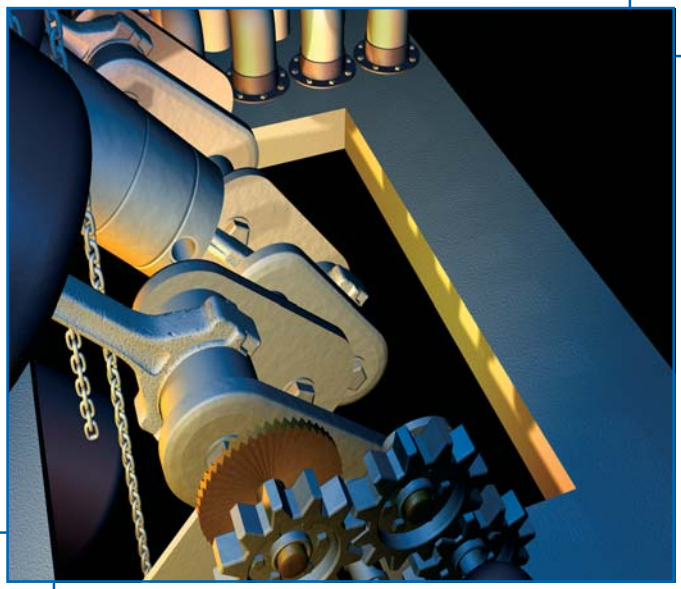
24 Renovating Building 501
26 Combat Support C2 Architecture: Supporting Expeditionary Airpower
46 2003 Project Priorities
49 Customer-Oriented Leveling Technique
54 In Search of the Smoking Gun—Maintenance Division
60 Maintenance Manpower Authorization Assessment
70 UAV Maintenance: Issues, Concerns, and Analyses
74 Integrating CBM+: A Roadmap for Air Force Processes
82 CAD/PAD Items
84 Meeting Your Needs—Contracting Division
90 Procurement Spend Analysis: Improving Enterprise Buying Decisions
102 Buyer Beware: Look Before You Leap into a Contract
106 *Contract Payment Guide*
108 CCO Handbook: Lessons Learned from Operation Enduring Freedom
112 More Than 20 Years of Capturing Logistics—*Air Force Journal of Logistics*
118 Great Idea Today? What Will You Do About It?
136 Yesterday, Today, and Tomorrow—Supply Division
142 Credit: Motivating Base-Level Repairs
150 Back Orders are Expected
154 Priority System: Aligning the Mission and the Need
158 Consumables Visibility: The New Flexible CRSP
162 CHPMSK: Business Booms when Combat Looms
166 Fuels Mobility Support Equipment: A Better Way to Train
182 Logistics Readiness: Innovation and Transformation
190 Safety: Vehicle Maintenance
194 Global Mobility Game 03
200 Expeditionary Medical Assets: Evaluating Recent Deployments
204 Readiness Reporting: War Reserve Materiel
208 Mobility Studies: You Can't Get There without a TPFDD
212 The AMC System: Analyzing TP1/999 Shipments
216 *Logistics Officer Handbook:* Roadmap Your Career
218 Space-A Travel: System Capability Analysis
222 Ramstein Superhub: An Analysis of Options
226 Afloat Prepositioning: Phase II
230 Determining Requirements: Air Force Vehicles
234 Analysis Connection—Analysis Division

AFLMA 2003

Our Continuing Knowledge, Technology, Innovation! *Commitment*

You won't find lots of fancy words in the pages that follow. As you'll soon notice, this review gets right to the point. That's part of our commitment to you—the most demanding customers in the world need to know what we're doing to solve their problems, and they need to know now.

GENERATING SOLUTIONS TODAY, SHAPING TOMORROW'S LOGISTICS



Our

Generating Solutions Today, Shaping Tomorrow's Logistics is what the Air Force Logistics Management Agency is all about. It conveys our strength and energy.

Our track record puts us in the lead in delivering robust, tailored answers to the most difficult and complex Air Force logistics problems. This can be seen in our efforts and partnerships that are turning expeditionary airpower support concepts into real-world capability. It also can be seen in our work in making dramatic improvements to the Air Force supply system and developing high-impact logistics publications and our leadership in planning and making logistics play in wargames, simulations, and exercises truly meaningful. The message is also loud—we work the important projects that shape tomorrow's Air Force, and we deliver what our customers need today!

The Agency continues to aggressively reach out to its customers. Also, we're not just attending conferences and meetings—in many cases, we're leading them. In other instances, we've represented the Air Force

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Continuing Commitment

Generating Solutions Today, Shaping Tomorrow's Logistics

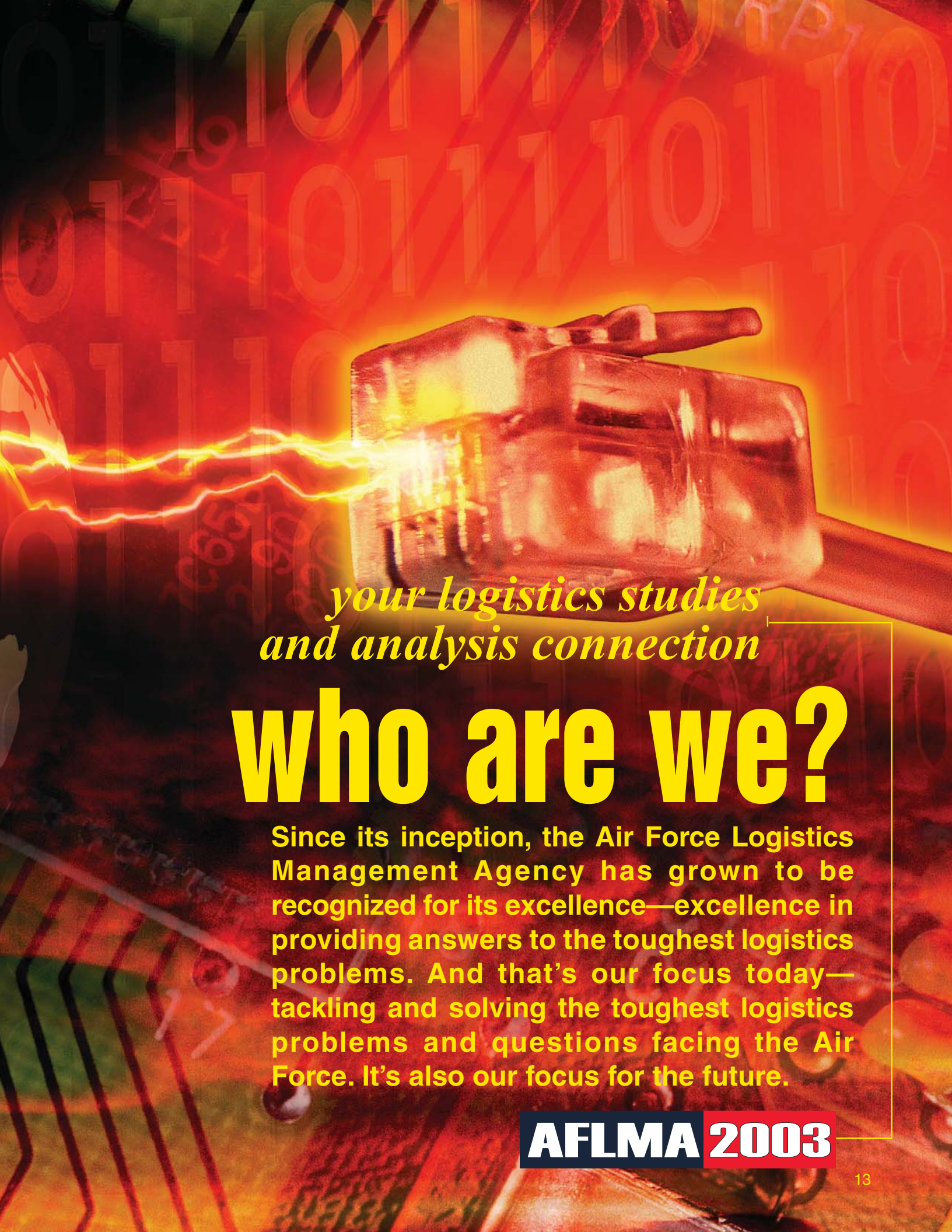
logistics community at major Department of Defense (DoD) logistics conferences. We have enhanced our World Wide Web (WWW) site to improve customer support, and we've made many of our products available on other WWW sites. At the same time, we've educated each incoming class of maintenance support group commanders before they take command of their organizations.

In addition, many of the logistics education publications created by the *Air Force Journal of Logistics* staff have become best sellers DoD-wide. Others are used as course materials at the Air War College and Air Command and Staff College. We even have had requests from several of our allies to use some of these materials in their professional military education programs. Finally, we've expanded our work with RAND in developing expeditionary airpower support concepts and solutions to *show-stopper* issues.

Important aspects of our commitment to customers' needs are the diversification of project sponsors and tailoring of our efforts.

We've delivered on commitments to our customers, we've partnered with our customers and industry, we've had an impact in shaping the support concepts of tomorrow, and the Air Force is benefiting from the synergy of our efforts. We've been on target—you can count on that continuing.

Colonel Michael A. Morabito, Commander


your logistics studies
and analysis connection
who are we?
Since its inception, the Air Force Logistics Management Agency has grown to be recognized for its excellence—excellence in providing answers to the toughest logistics problems. And that's our focus today—tackling and solving the toughest logistics problems and questions facing the Air Force. It's also our focus for the future.
AFLMA 2003

Lots of organizations have catchy mottoes. Likewise, many have catchy vision statements. We do, too. But there's a big difference—we deliver on what we promise. *Generating Solutions Today, Shaping Tomorrow's Logistics* aren't just words to us; they're our organizational culture. We use a broad range of functional, analytical, and scientific expertise to produce innovative solutions to problems and design new or improved concepts, methods, systems, or policies that improve peacetime readiness and build war-winning logistics capabilities. We provide quick, focused, responsive answers to our customers' needs and problems.

Our key strength is our people. They bring a broad range of skills to the organization; all

AFLMA 2003

who are we?

your logistics studies and analysis connection

the officer positions are advanced academic degree positions, to include two PhD positions. We also have two enlisted advanced academic degree positions. But more important, virtually all of them have recent field experience. *They've been there and done that*. They have the kind of experience that lets us blend transformation, innovation, and new technology with real-world common sense and moxie. It's also the kind of training and experience you won't find with our competitors. Our special blend of problem-solving capabilities is available to every logistician in the Air Force. No other Air Force organization offers the logistics research and analysis service that we provide. We deliver an Air Force-wide *honest broker* view of logistics problems.

Our goal to tackle tough Air Force logistics issues remains the cornerstone of AFLMA. Generating solutions today and shaping tomorrow's logistics conveys our strength and our commitment.

Colonel Michael A. Morabito, Commander

GENERATING SOLUTIONS TODAY, SHAPING TOMORROW'S LOGISTICS

There are many ways to measure success. One of them is the *count*—how much did you do, how much got done, what did you complete? A second way to measure success is *meeting your customers' needs*. That means three things: first, understanding what the problem really is; second, giving your customers a great, workable solution; and third, meeting Air Force study priorities.

The Air Force Logistics Management Agency completed another highly successful year working the problems and concerns of the Air Force logistics community.

There are many ways to measure success. One of them is the *count*—how much did you do, how much got done, what did you complete? This last year, we completed 32 improvement studies, 30 consulting projects, and 2 Requirements Team studies for our customers. Overall, this was an 83-percent increase in project production and a 45-percent increase in improvement study completion. The count included a variety of studies that either provided solutions to real-world problems or tackled the myriad of issues and problems that surround making expeditionary airpower viable and supporting the warfighter. We worked hard on this—developing, implementing, and maintaining systems to optimally allocate Air Force spare parts; ensuring deploying units get the spares they need while minimizing overall Air Force impact; developing contingency high-priority mission spares kits; and ensuring accurate data for budget, buy, repair, and distribution decisions for Air Force spares. In our role as the executive agent for logistics play in wargames, we've been involved in a broad range of wargames or seminars that explored how we can better support the warfighter and improve the fidelity and realism of logistics play. We provided the Air Force the capability to develop and test global strike task force concepts rapidly, as well as highlighted lessons learned concerning the logistical implications and critical planning factors logistics plays in waging war. We'll continue to do these same kinds of things next year.

A second way to measure success is *meeting your customers' needs*. That means three things: first, understanding what the problem really is; second, giving your customers a

Colonel Michael A. Morabito, Commander

THE RESULTS

GENERATING SOLUTIONS TODAY, SHAPING TOMORROW'S LOGISTICS

great, workable solution; and third, meeting Air Force study priorities. We also worked hard on this—improving our interface with customers and focusing more closely on established studies priorities. You can count on more of the same in 2004 and for the Agency to continue to take on the tough questions, issues, and problems and to deliver robust, tailored answers, and solutions.

In 2004, you also will see a major change in how studies priorities are identified. The Logistics Senior Study Group has been eliminated, and priorities will be established by the Council of Directors

Last year, we published a variety of monographs and educational materials that focused on Air Force logistics thought, lessons from history, doctrine, and concerns. For some time, there's been a void in this area—we're filling that void with high-quality, high-impact publications. Of particular note was *Combat Support: Shaping Air Force Logistics for the 21st Century.* This book communicates the essentials of the combat-support analyses completed by RAND and the Air Force Logistics Management Agency over the last 6 years. The research was conducted to help the Air Force configure the Agile Combat Support system in order to meet expeditionary airpower goals. We also developed and published two major handbooks—*Vehicle Maintenance Safety: A Guide for the Air Force Vehicle Maintainer and Contingency Contracting: A Handbook for the Air Force CCO.*

We also have continued to improve the *Air Force Journal of Logistics*—the Air Force's premier logistics research journal. You'll note a major improvement in the quality of the production materials and increased use of color—all items that improve the overall quality, durability, and readability of the publication.

We remain dedicated to providing practical and innovative solutions to today's and tomorrow's logistics challenges. We solicit your continuing partnership—send us your logistics challenges and let us develop workable, effective solutions to improve Air Force combat capability.

2003 Completed Projects

CONTRACTING

- *Air Force Construction Contracting Guide*
  LC200302201—Improvement Study
  (Canceled due to discovery of acceptable substitute based on CON 244 Construction Contracting training material.)
- Spend Analysis of Operational Contracting
  LC200200216101—Improvement Study
- *Contingency Contracting Handbook*
  LC200000405—Improvement Study
- Contingency Contracting Doctrine *Fire Brigade*
  LC200231200—Consulting Report
- Air Force Pricing Assessment
  LC200226100—Consulting Report
- *Financial Analysis Tools Reference Guide*
  LC200216100—Improvement Study
- *Contract Payment Guide*
  LC200302202—Improvement Study
- Commodity Council Opportunity Analysis
  LC2003265000—Consulting Report

MAINTENANCE

- CSAF Logistics Review: Supporting Implementation and Testing
  LM200100400—Consulting Study
- Air Expeditionary Force Logistics Concept of Operation
  LM199733000—Consulting Study
- Automated Maintenance Data Analysis
  LM200212002—Improvement Study
- F101 Engine Regional Repair Facility Cost-Benefit Analysis
  LM200226800—Improvement Study
- Follow-on Technical Support for Weapons Load Crew Management Program
  LM199812000—Consulting Study

- Support Web Site for Munitions CD-ROM
  LM199924500—Consulting Study
- Cost-Benefit Analysis of Warranties for Support Equipment
  LM200300701—Improvement Study
- Maintenance Manpower Authorization Assessment
  LM200305007—Consulting Study
- Condition-Based Maintenance Plus Initiative
  LM200301800—Improvement Study
- Exploiting Automatic Identification/Serialized Tracking Technology
  LM200304100—Improvement Study
- Update and Upgrade the *Munitions Manager's Reference Guide*
  LM200300600—Improvement Study

SUPPLY

- Measuring the Impact of Contingency High-Priority Mission Support Kits Normalization
  LS200305010—Consulting Study
- Analyze Repair Prioritization for Items not Included in EXPRESS
  LS200300816—Improvement Study
- BSM Implementation Metrics
  LS200221300—Consulting Study
- Air Force Alternatives for Automating the Weapon-System Support Program Update Process
  LS200211200—Improvement Study
- Consolidation of Refueling Maintenance, Liquid Fuels Maintenance, and Fuels Management Under the Maintenance Group
  LS200328800—Consulting Study
- Reparable Item Adjusted Stock Level Reconciliation
  LS200325802—Consulting Study
- Analysis of Implementing a Single MICAP/AWP Database
  LS200311400—Consulting Study
- NEXRAD System Reliability, Maintainability, and Supply Supportability
  LS199930900—Improvement Study
- Air Force Back-Order Analysis
  LS200126400—Improvement Study
- Analyze Repair Prioritization for Items not Included in EXPRESS
  LS200300816—Improvement Study
- Analysis of Air Force Retail Retention Policy Changes Implemented in January 2001
  LS200117200—Improvement Study
- Fuels Mobility Support Equipment Training
  LS200115100—Improvement Study
- Impact of Force Activity Designator Code Changes on AETC's Supply Support
  LS200300803—Improvement Study
- Analysis of Implementing the *One-Per-User* Rule in Readiness-Based Leveling
  LS200300719—Improvement Study
- Alternatives to Funding Centrally Managed/Procured Equipment
  LS200133400—Improvement Study
- COLT Part I: Assessing Air Force Consumable Item Management Initiatives
  LS200212700—Improvement Study
- COLT Part II: Assessing Retail COLT Implementation
  LS200303602—Improvement Study
- Analysis and Review of Air Force Safety-Level Implementation Issues
  LS200233700—Improvement Study
- Cryogenic Production Improvement Study
  LS200233600—Improvement Study
- Alternative Retail Stockage Requirements for C-E Spares
  LS200020200—Improvement Study
- Analysis of Consumable Item Support for Contingency Operations
  LS200300702—Improvement Study
- The Cost of Eliminating the Peacetime Operating Stock Offset for In-Place Readiness Spares Packages
  LS200311200—Requirements Team Study
- Review Credit Return and Quality Deficiency Report Procedures
  LS200300703—Requirements Team Study
- Air Force Customer Wait Time Metrics Support
  LS200202901—Consulting Study
- Support to Logistics Transformation/Spares Campaign: Virtual Single ICP
  LS200203100—Consulting Study
- Air Force Spares Budget Requirement
  LS200101801—Consulting Study
- Air Force Total Ownership Cost Data Feed
  LS200210200—Consulting Study
- National Stock Number Issue and Stockage Effectiveness (Phase Four)
  LS200205600—Consulting Study

Logistics Readiness

- *Operation Noble Eagle and Enduring Freedom Installations and Logistics Legacy* Book
  LT200209200—Consulting Study
- Air Force Combat Readiness CD-ROM
  LT199914700—Improvement Study
- *Vehicle Maintenance Operational Risk Management Handbook*
  LT200212000—Consulting Study
- Air Force Vehicle Requirements Determination
  LT200213400—Improvement Study
- Improving Processing Shipments: Part I—Inbound
  LT200216102—Improvement Study
- Review of Air Force Instruction on Intransit Visibility
  LT200305004—Consulting Study
- Global Command and Control System/Deliberate and Crisis Action Planning and Execution System Support for Combat Support Center-Pentagon
  LX200312500—Consulting Study
- Global Strike Task Force Mobility Assessment, Part I
  LX200232900—Consulting Study
- Reconstitution Planning: An Analysis of Policies, Procedures, and Lessons Learned
  LX200301604—Consulting Study
- 42d Air Base Wing Operational Readiness Inspection Assistance
  LX200312501—Consulting Study
- Schriever II Wargame
  LX200304400—Consulting Study
- Global Strike Task Force Mobility Study, Part II
  LX200302900—Consulting Study
- Afloat Propositioning of Nonmunitions War Reserve Materiel, Phase II
  LX200125700—Improvement Study
- *Logistics Officer Handbook 2003* Update
  LX200202201—Improvement Study
- Global Engagement VI
  LX200109200—Consulting Study
- War Reserve Materiel Readiness Reporting
  LX200211400—Improvement Study
- Air Expeditionary Wing Analysis System
  LX200205200—Consulting Study
- Homeland Security Wargame
  LX200305005—Consulting Study
- Evaluation of Recent Deployments of Expeditionary Medical Assets
  LX200310702—Improvement Study

results at a glance

2003 Completed Projects

32 Improvement Studies
30 Consulting Studies
2 Requirements Team Studies
1 Canceled Study

2003 Completed Expeditionary Airpower/Agile Combat Support Studies and Research

- *Contingency Contracting Handbook*
  LC200000405—Improvement Study
- Contingency Contracting Doctrine *Fire Brigade*
  LC200231200—Consulting Report
- CSAF Logistics Review: Supporting Implementation and Testing
  LM200100400—Consulting Study
- Air Expeditionary Force Logistics Concept of Operation
  LM199733000—Consulting Study
- Maintenance Manpower Authorization Assessment
  LM200305007—Consulting Study
- Update and Upgrade the *Munitions Manager's Reference Guide*
  LM200300600—Improvement Study
- Measuring the Impact of Contingency High-Priority Mission Support Kits Normalization
  LS200305010—Consulting Study
- Analyze Repair Prioritization for Items not Included in EXPRESS
  LS200300816—Improvement Study
- Analysis of Implementing a Single MICAP/AWP Database
  LS200311400—Consulting Study

- Air Force Back-Order Analysis
  LS200126400—Improvement Study
- Analyze Repair Prioritization for Items not Included in EXPRESS
  LS200300816—Improvement Study
- Analysis and Review of Air Force Safety-Level Implementation Issues
  LS200233700—Improvement Study
- Cryogenic Production Improvement Study
  LS200233600—Improvement Study
- Analysis of Consumable Item Support for Contingency Operations
  LS200300702—Improvement Study
- The Cost of Eliminating the Peacetime Operating Stock Offset for In-Place Readiness Spares Packages
  LS200311200—Requirements Team Study
- Support to Logistics Transformation/ Spares Campaign: Virtual Single ICP
  LS200203100—Consulting Study
- Air Force Readiness Combat Readiness CD-ROM
  LT199914700—Improvement Study
- Global Command and Control System/ Deliberate and Crisis Action Planning and Execution System Support for Combat Support Center-Pentagon
  LX200312500—Consulting Study
- Global Strike Task Force Mobility Assessment, Part I
  LX200232900—Consulting Study
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- Schriever II Wargame
  LX200304400—Consulting Study
- Global Strike Task Force Mobility Study, Part II
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- Afloat Propositioning of Nonmunitions War Reserve Materiel, Phase II
  LX200125700—Improvement Study
- Global Engagement VI
  LX200109200—Consulting Study
- War Reserve Materiel Readiness Reporting
  LX200211400—Improvement Study
- Air Expeditionary Wing Analysis System
  LX200205200—Consulting Study
- Evaluation of Recent Deployments of Expeditionary Medical Assets
  LX200310702—Improvement Study

2003 Major Publishing Projects

- *Logistics and Warfighting: Thinking About Agile Combat Support*
- *Logistics Dimensions 2003*
- *Contingency Contracting: A Handbook for the Air Force CCO*
- *Vehicle Maintenance Safety: A Guide for the Air Force Vehicle Maintainer*
- *Cumulative Index: Air Force Journal of Logistics*
- *A Manual for Style: Air Force Journal of Logistics*
- *Combat Support: Shaping Air Force Logistics for the 21st Century*

Where We're Going

generating solutions today, shaping tomorrow's logistics

- Continue to respond to the revolutionary and evolutionary changes in logistics
- Continue to lead in developing robust, tailored answers to the most complex Air Force problems
- Continue to reach out aggressively to our customers
- Provide quick-turn support for critical studies and projects (less than 6 months)
- Support the Air Force logistics community and professional military education schools with high-quality publications

Increase Air Force readiness and combat capability by enhancing logistics efficiency and effectiveness

AFLMA

Your Logistics Studies and Analysis Connection

Renovating Building 501

This Old House—Upgrading AFLMA Facilities in the Next Year

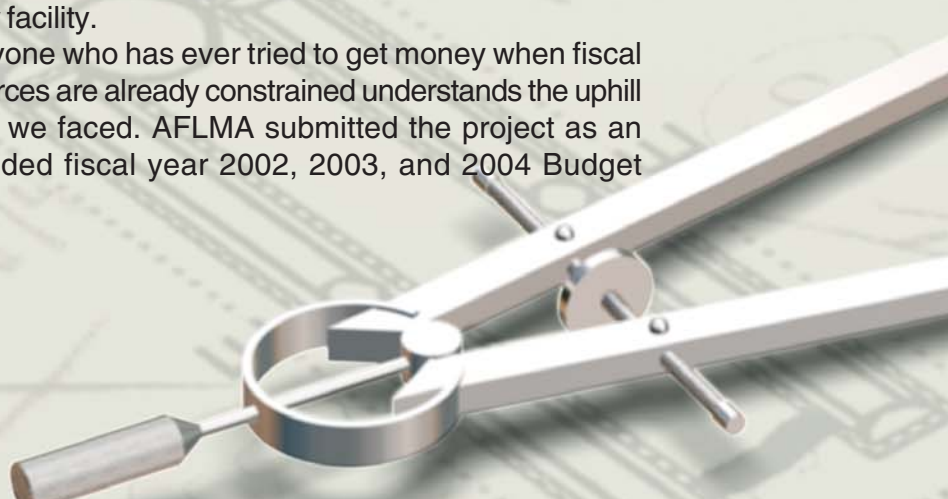
Lieutenant Colonel David R. Patterson

If you ever have had the opportunity to stop by the Air Force Logistics Management Agency, two things would have been memorable about our building. First, the inside of our building looked a lot like a hospital that had been modified into office space. Second, while a lot of hard work, perseverance, and determination have gone into making the inside of the building functional and presentable, the 12-foot high ceilings, ceramic floor tile, exposed wiring and steam pipes, and concrete walls made you think the building was built for another era. If you came to that conclusion, you would be exactly right. The building occupied by AFLMA since 1975 was built in 1940 as a state prison hospital. Our building is still very structurally sound, testimony to the American work ethic, but the World War II era mechanical and electrical systems are in need of a complete facelift to bring them up to current building codes.

Since AFLMA has occupied the building, there have been some quality-of-life improvements to the facility. For example, we have painted and added wall coverings. We have carpeted portions of the building, as well as replaced ten air-conditioner units, repaired leaking roofs, renovated two conference rooms, and constructed a secure room for the AFLMA Contingency Analysis Center.

When it came time to really consider what to do with the facility, there were several options considered: (1) do nothing and continue to patch where and when needed, (2) do a military construction project to build a new building, (3) do a building renovation, (4) or lease commercial space or use another building on Maxwell or Gunter. Of the options, the two that seemed to have the most hope for success were renovation or new construction. In 1999, the Air Force Center for Environmental Excellence conducted a facility development study to evaluate the two options. The result of the study was that it would be in the best interest of the Air Force to renovate the existing building rather than build a new facility.

Anyone who has ever tried to get money when fiscal resources are already constrained understands the uphill battle we faced. AFLMA submitted the project as an unfunded fiscal year 2002, 2003, and 2004 Budget

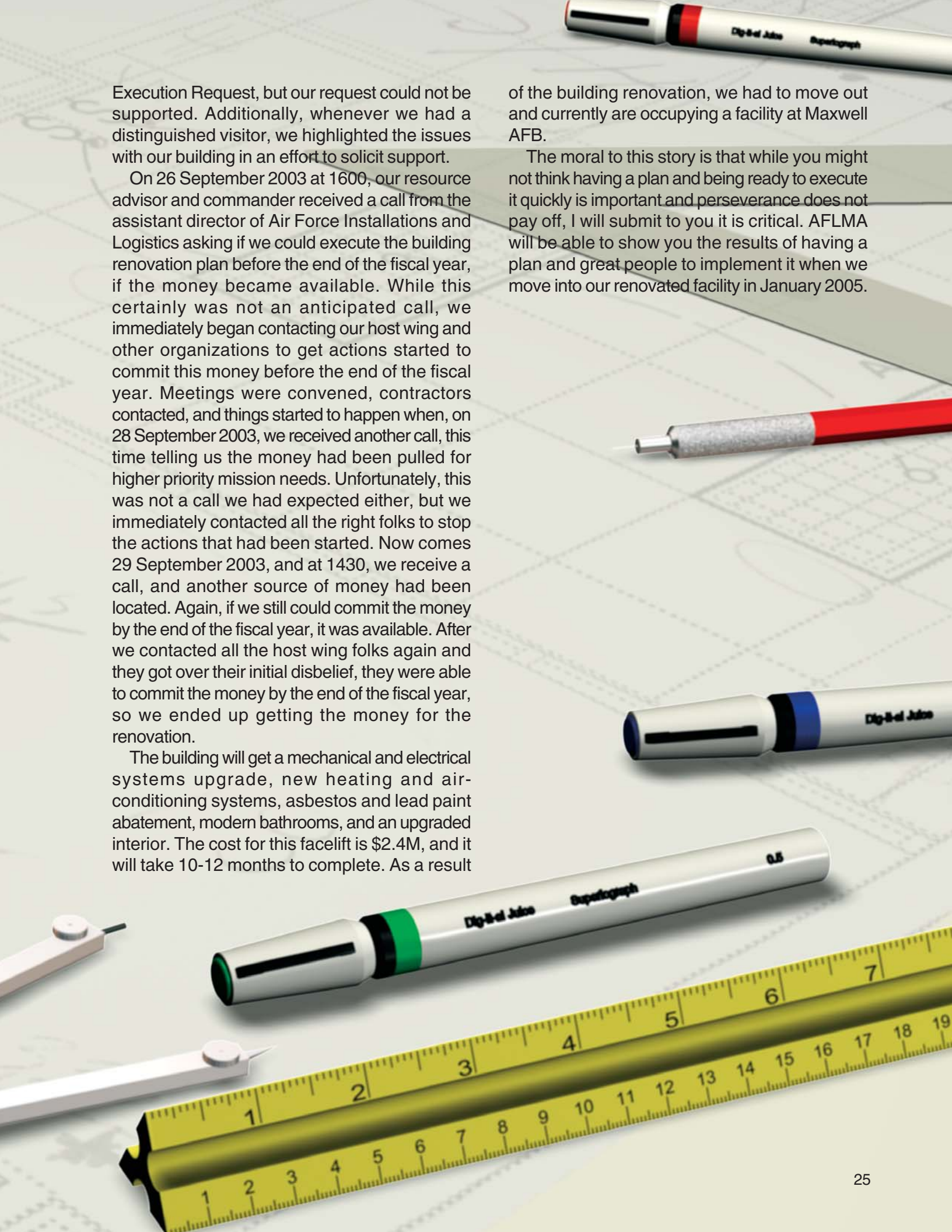


Execution Request, but our request could not be supported. Additionally, whenever we had a distinguished visitor, we highlighted the issues with our building in an effort to solicit support.

On 26 September 2003 at 1600, our resource advisor and commander received a call from the assistant director of Air Force Installations and Logistics asking if we could execute the building renovation plan before the end of the fiscal year, if the money became available. While this certainly was not an anticipated call, we immediately began contacting our host wing and other organizations to get actions started to commit this money before the end of the fiscal year. Meetings were convened, contractors contacted, and things started to happen when, on 28 September 2003, we received another call, this time telling us the money had been pulled for higher priority mission needs. Unfortunately, this was not a call we had expected either, but we immediately contacted all the right folks to stop the actions that had been started. Now comes 29 September 2003, and at 1430, we receive a call, and another source of money had been located. Again, if we still could commit the money by the end of the fiscal year, it was available. After we contacted all the host wing folks again and they got over their initial disbelief, they were able to commit the money by the end of the fiscal year, so we ended up getting the money for the renovation.

The building will get a mechanical and electrical systems upgrade, new heating and air-conditioning systems, asbestos and lead paint abatement, modern bathrooms, and an upgraded interior. The cost for this facelift is $2.4M, and it will take 10-12 months to complete. As a result of the building renovation, we had to move out and currently are occupying a facility at Maxwell AFB.

The moral to this story is that while you might not think having a plan and being ready to execute it quickly is important and perseverance does not pay off, I will submit to you it is critical. AFLMA will be able to show you the results of having a plan and great people to implement it when we move into our renovated facility in January 2005.



Robert S. Tripp, RAND
Patrick Mills, RAND
Amanda Geller, RAND
C. Robert Roll, Jr, RAND
Major Cauley von Hoffman, AFLMA
Lieutenant Colonel David L. Johansen, RAND Fellow
James A. Leftwich, RAND

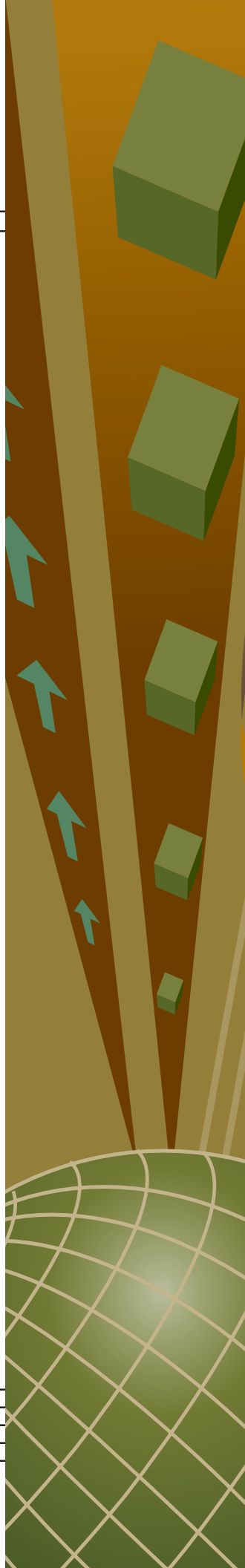
The shift toward expeditionary operations presents numerous challenges, particularly in combat support. To meet these challenges, the Air Force requires a *global* CS infrastructure.

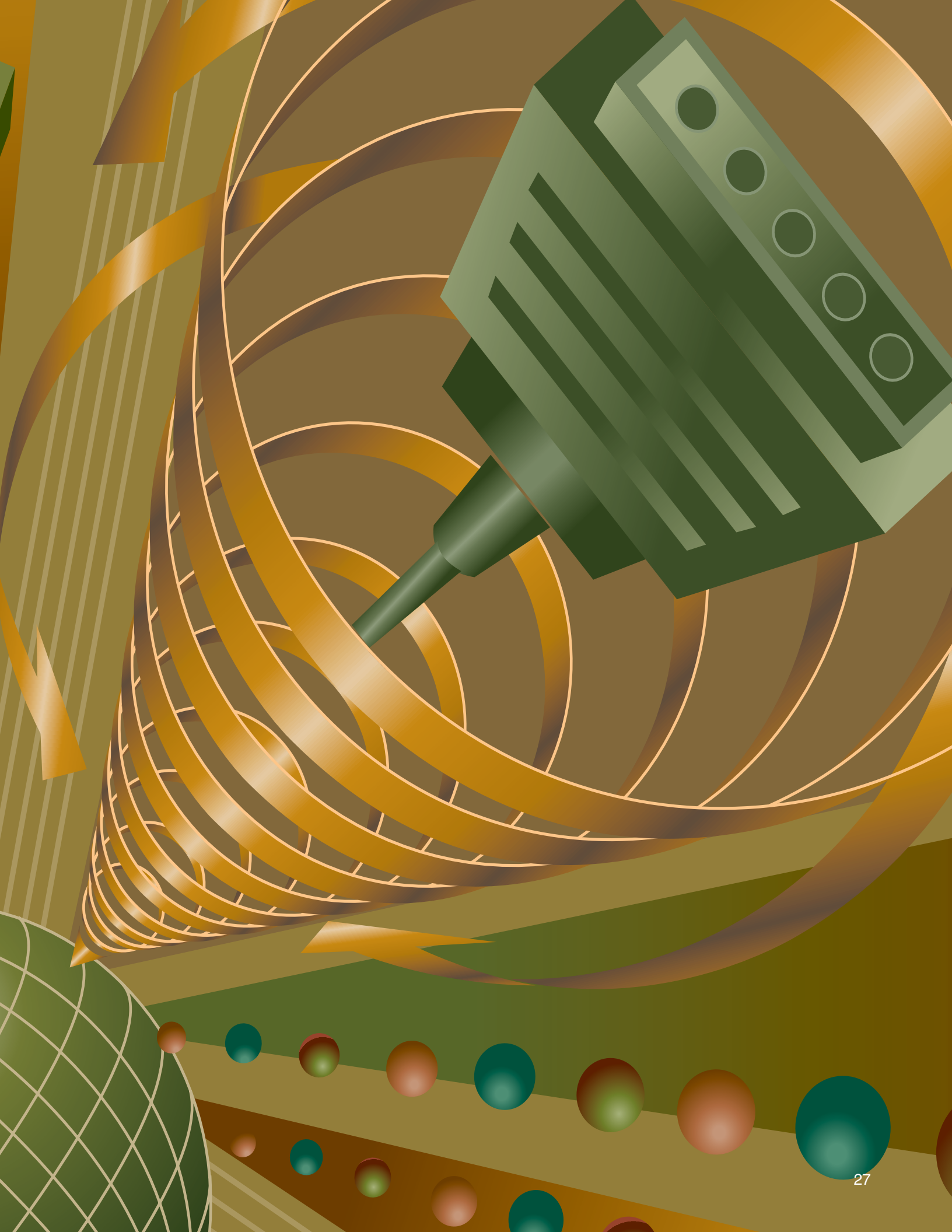
Combat Support C2 Architecture

Supporting Expeditionary Airpower

Introduction

Since the end of the Cold War, the US security environment has undergone extensive transitions. Combat has evolved from a theater-centric perspective, which focused on well-understood enemies in well-known locations, to a global perspective that requires preparations for conflicts at any time and in any part of the world. During the Cold War, the United States had a large force presence permanently positioned at established bases, but more recent demands for US military presence or intervention have required the Air Force to stage a large number of deployments, often on short notice and to unanticipated locations, with a substantially smaller force than existed in the 1980s. In response to this changing environment, the Air Force formulated a new concept of force organization, the air and space expeditionary force (AEF). The expeditionary concept is based on the premise





Combat Support C2 Architecture: Supporting Expeditionary Airpower

The shift toward expeditionary operations presents numerous challenges, particularly in combat support. To meet these challenges, the Air Force requires a global *CS infrastructure.*

that forces tailored rapidly to support anything from a small-scale contingency to a major theater war—deployed quickly from the continental United States (CONUS) to locations around the globe and employed immediately—can serve as a viable alternative to the permanent forward presence established in the Cold War.

The shift toward expeditionary operations presents numerous challenges, particularly in combat support (CS). To meet these challenges, the Air Force requires a *global* CS infrastructure. RAND and Air Force Logistics Management Agency (AFLMA)-partnered analyses offer recommendations for such an infrastructure, which include developing forward operating locations (FOL) from which missions are flown, forward support locations (FSL) and CONUS-support locations (CSL), regional repair and storage facilities, a transportation system for distribution, and a combat support command and control (CSC2) system.

At the request of the Air Force Deputy Chief of Staff, Installations and Logistics (Lieutenant General Michael E. Zettler), RAND Project Air Force (PAF) and AFLMA began an indepth analysis of the CSC2 system in October 2000. This article briefly summarizes their work in this area. In this work, we presented concepts for guiding the development of architecture for CS execution planning and control activities within an integrated operations and CSC2 framework.[1] We use CSC2 as a shortened name but stress that this architecture is part of the integrated operations and CS framework. This architecture is intended for use in transforming the current Air Force CSC2 system into one more capable of supporting expeditionary forces.

Implementing the AEF: Expeditionary Combat Support

Initially, the Air Force gave a great deal of attention to determining AEF composition and scheduling. With respect to deployment responsibilities, much of the effort and progress concerning expeditionary combat support focused on the deployment execution—how to compress time lines for deploying a unit's support functions, given current processes and equipment.

To complement Air Force progress in these areas, we have concentrated on strategic decisions that affect the design of the CS infrastructure necessary to support rapid deployments. The original AEF concept envisioned packages deploying to any airfield around the world that had a runway capable of handling the operational airlift aircraft, regardless of whether the airfield was a fully equipped base or a bare base with minimal facilities. Reliance on prepositioned assets was to be minimized, if not eliminated. However, analyses have shown[2] that, at present, prepositioned assets cannot be eliminated entirely: the current logistics processes cannot support the timing requirements, and most equipment is too heavy to deploy rapidly. While new technologies and policies can improve this situation in the mid to long term, implementing the AEF concept currently requires judicious prepositioning overseas. Global CS infrastructure preparation is, therefore, a central function of planning expeditionary support. There are five basic components of the global infrastructure: forward operating locations, forward support locations, CONUS support locations, a responsive distribution system, and a CSC2 system.

FOLs are locations from which aircraft conduct their operations or missions. Each FOL requires different amounts of equipment to prepare the base for operations and, as a result, has a different time line and transportation requirement. Two options are available for supplying these resources: FSLs in or near the theater of operations and CONUS support locations. An FSL can be a storage location for US war reserve materiel

(WRM), repair location for selected avionics or engine maintenance action, transportation hub, or combination thereof. The exact capability of an FSL will be determined by the forces it will support and by risks and costs of positioning specific capabilities. The network of CSLs, FSLs, and FOLs needs to be coordinated to provide the resources necessary to meet operational goals.

The configuration of these components will depend on several elements, including local infrastructure and force protection, political aspects (for example, access to bases and resources), and how site locations may affect alliances. It is, therefore, important to consider tradeoffs between several competing objectives, such as time line, cost, deployment footprint, risk, flexibility, and sortie generation. Prepositioning everything at bases from which operations will be conducted minimizes the deployment airlift footprint and time line required to begin operations, but it also reduces flexibility, adds political and military risk, and incurs a substantial peacetime cost if several such bases must be prepared. Bringing support from the CONUS, on the other hand, increases flexibility and can reduce risk and peacetime cost for materiel. However, setting up support processes in this situation takes longer, and the deployment footprint is larger. FSLs provide a compromise between prepositioning at FOLs and deploying everything from CONUS. They have little effect on the time line for initial capability, but they do avoid the necessity of having a tanker air bridge for the extra strategic lift from CONUS. Further, the airlift that would have been used to deploy support equipment from the CONUS will be available for deploying additional combat units.

The global infrastructure and its network of operating and support locations also are dependent on an assured distribution system and a CSC2 system to orchestrate every facet of FOL beddown and sustainment. If units must deploy with minimal support and depend on resupply from CSLs and FSLs, they will need to have an assured resupply link whose responsiveness is aligned with the support available at the FOL. The strategic infrastructure envisioned here also will require a more sophisticated CSC2 structure to coordinate support activities across the components of the network and phases of operations.[3]

Defining CSC2

To begin, a definition of CSC2 is needed. Joint and Air Force doctrine defines command and control as the exercise of authority and direction, by a properly designated commander over assigned and attached forces in the accomplishment of the mission.[4] Specifically, command and control includes the battlespace management process of planning, directing, coordinating, and controlling forces and operations. It involves integration of the systems, procedures, organizational structures, personnel, equipment, information, and communications designed to enable a commander to exercise command and control across a range of military operations.[5] The definition of an operational architecture encompasses many of the same elements. It is a description of tasks, operational elements, and information flows required to accomplish or support a Department of Defense function or military operation. In our study, we used these definitions, applied to Air Force CS activities, to identify and describe processes involved in CSC2 at each echelon and across the phases of operations.

Developing an Operational Architecture for CSC2

The objective of our analysis was to develop a set of concepts the Air Force can use to establish a CSC2 operational architecture capable of

The objective of our analysis was to develop a set of concepts the Air Force can use to establish a CSC2 operational architecture capable of supporting the AEF.

Combat Support C2 Architecture: Supporting Expeditionary Airpower

Our analysis of the Air Force CSC2 process revealed critical process *shortfalls in the* AS-IS *architecture.*

supporting the AEF. The analytic approach used in developing the TO-BE architecture is shown in Figure 1. The first step in this approach was to define expected CSC2 functionality. The objectives of CSC2 are dictated primarily by AEF operational needs summarized in Table 1, along with the CSC2 functionality required to meet them.

Based on the desired CSC2 functional characteristics and analysis of the *AS-IS* architecture, we developed *TO-BE* concepts and an associated operational architecture. The *TO-BE* operational architecture is documented in a database containing process activities and tasks in a hierarchical structure. It also contains information required to perform the tasks and information source; products produced by each activity and recipient of the product; and finally, the identification of the organizational node responsible for performing the activities and tasks.

Our analysis of the Air Force CSC2 process revealed critical *process* shortfalls in the *AS-IS* architecture; these can be grouped into four categories:

- Poor integration of CS input into operational planning
- Absence of feedback loops and the ability to reconfigure the CS infrastructure dynamically
- Poor coordination of CS activities with the joint community
- Absence of resource allocation arbitration across competing theaters

In the report, we propose a *TO-BE* CSC2 system that would enable the Air Force to meet its operational goals by relying on proven process elements. The future architecture would:

- Enable the CS community to estimate requirements quickly for force package options, assess the feasibility of operational and support

EAF Operational Need	CSC2 Requirements
Rapidly tailor force packages to achieve desired operational effects	Estimate CS requirements for suitable force package options; assess feasibility of alternative operational and support plans; create CS performance parameters necessary to achieve operational effects
Deploy rapidly	Determine FOL beddown capabilities for force packages and facilitate rapid TPFDD development
Employ quickly	Configure distribution network rapidly to meet employment time lines and resupply needs
Shift to sustainment smoothly	Execute resupply plans and monitor performance
Allocate scarce resources to where they are needed most	Determine impacts of allocating scarce resources to various combatant commanders and prioritize allocations to users
Adapt to changes quickly	Indicate when actual CS performance deviates from planned performance parameters and initiate and implement get-well plans

Table 1. CSC2 Functionality Required to Meet EAF Operational Goals

plans, and establish performance parameters needed to achieve desired operational effects;
- Quickly determine beddown capabilities, facilitate rapid time-phased force and deployment data (TPFDD) development, and configure a distribution network to meet employment time lines and resupply needs;
- Facilitate execution resupply planning and monitor performance;
- Determine impacts of allocating scarce resources to various combatant commanders; and
- Indicate when CS performance deviates from the desired state and facilitate development and implementation of get-well plans.

Finally, the report offers recommendations to help transition the Air Force CS community from the current CSC2 architecture to the future concept. The recommendations are as follows:

- Clarify Air Force CSC2 doctrine and policy
- Evolve to standing CSC2 organizations
- Emphasize enhanced training for both operations and CS personnel on CSC2
- Enhance capabilities by fielding appropriate CSC2 information systems and decision support tools

Process Shortfalls

Poor Integration of CS Input into Operational Planning

The conventional roles of the operations and CS communities entail separate and relatively independent activities. Operational plans often are developed without adequate regard to CS feasibility.[6] Figure 2 identifies where some of these disconnects impact the planning and execution process. Early in the planning process, the strategy cell, consisting of A-3 and A-5 planners, is responsible for recommending courses of action to the Joint Forces Air Component Commander. CS personnel are then tasked with supporting the operational plans and must generate the appropriate resources to support a particular TPFDD or air tasking order. This serial approach can result in prolonged development of unsupportable plans, requiring major restructuring when CS factors

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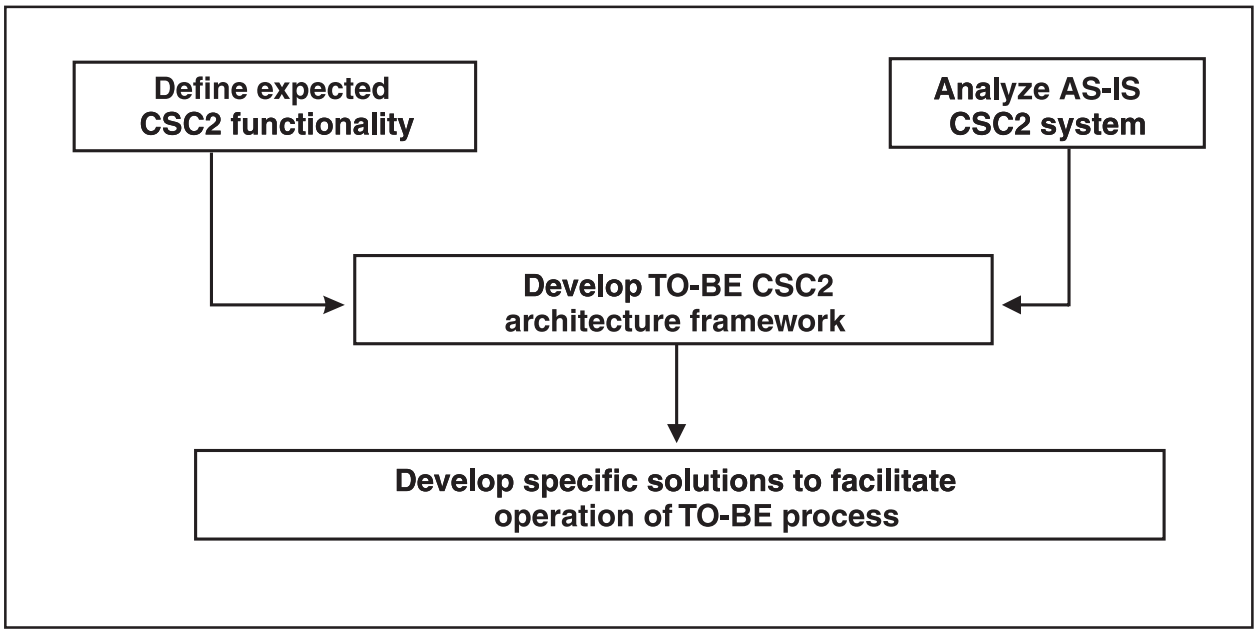

Figure 1. Analysis Approach

An additional hindrance to the incorporation of CS input into operational planning is a lack of capability assessments driven by the general shortage of up-to-date and reliable CS resource information.

eventually are brought to light. When attempts are made to incorporate CS input into operational planning, the traditional separation between these communities hinders effective integration. Most logisticians, for example, are not trained in and do not participate in air campaign planning and, therefore, may not have a full understanding of how and when CS considerations are used in the planning process.[7] In many of the CS functional areas, people are not equipped to communicate essential aspects of CS options in operationally understood metrics. As a result, information is not always provided to planners in operationally relevant terms; for example, forward operating location, initial operating capability, and sortie generation capability.[8] Furthermore, when plans are discovered to be unsupportable, CS personnel generally are not familiar enough with operational objectives to contribute to the development of alternative plans.

At the same time, operators lack CS training and, hence, tend not to consider the effect support capabilities have on the performance of planned missions. Part of planning effects-based operations must include the CS metrics that will enable them; for example, the sortie generation capability by day for each mission design series. When CS aspects of plans are overlooked, the importance of reliable information throughout the operational planning process is not valued. This delays plan development, slows the response to changing plans, and increases vulnerability to failure for want of adequate support.

An additional hindrance to the incorporation of CS input into operational planning is a lack of capability assessments driven by the general shortage of up-to-date and reliable CS resource information. Assessments may be available for some high-priority situations as a part of the deliberate planning process, but they are made for specific circumstances and, hence, are not conducted with a systematic methodology. Therefore, when information and assessments are needed quickly for nonstandard contingencies, the process is slow and ad hoc, with data requirements and organizational responsibilities being ambiguous and inconsistent. In other cases, assessment techniques may

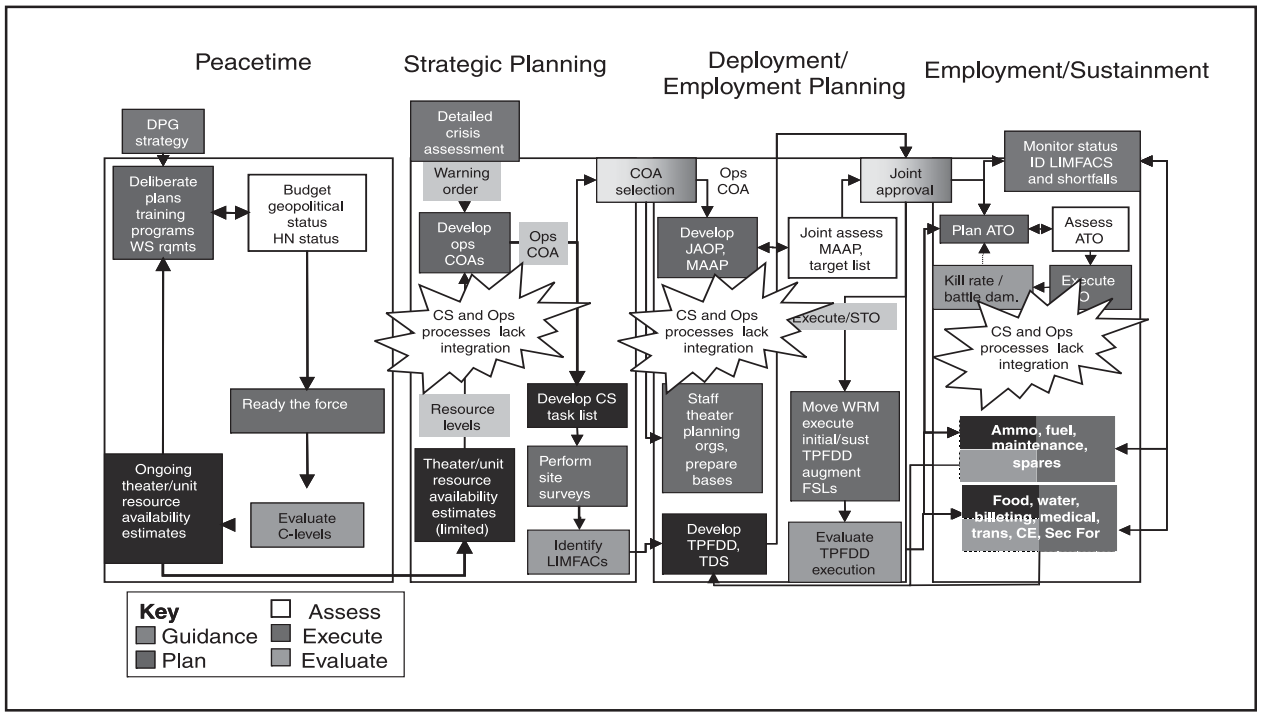

Figure 2. CS and Operations Process Integration Shortfalls

exist—for example, readiness spares package assessment techniques—but information on the projected operations tempo may not be made available to supply analysts. There are no ready sources or a standing organization where this information can be found. One of the most commonly described shortcomings of the crisis action planning process is that operators have to make plans with insufficient and unreliable logistics data.[9] As a result, aspects of plans often are based on outdated information and assumptions with CS information requested piecemeal as it becomes necessary.

Absence of Feedback Loops and the Ability to Reconfigure the CS Infrastructure Dynamically

In the outlined *TO-BE* concept, CS and operations activities must be monitored continuously for changes in performance and regulated to avoid failures. This requires monitoring, assessment, and intervention capabilities more sophisticated than now employed. Currently, asset visibility is limited, and intransit visibility is incomplete.[10] Thus, it is difficult to estimate resource levels and arrival times. Rates of critical processes (component failure, repair, munitions buildup, cargo transportation, and civil engineering) are recorded sporadically. Even when these resource and process data are available, they are typically the focus of planning and deployment activities, but less so for employment and sustainment. Because operations can change suddenly, these data must be available continuously throughout operations in order to make adjustments. Currently, no process or organization exists to support this functionality.

When monitoring reveals a mismatch between desired and actual resource and process performance levels, the ability to assess the source of this discrepancy is often lacking. This is particularly true for activities acting across multiple theaters, such as depot repair, or multiple services, such as a theater distribution system. With limited monitoring and fault assessment, the ability to intervene and adjust CS activities in real time is limited.

Poor Coordination of CS Activities with the Joint/Allied/Coalition Communities

Ultimately, most CS activities entail some degree of coordination among the Services and with the joint community. Examples include fuels management, distribution and storage of munitions and housekeeping sets, and transportation. Nowhere is such coordination more important and troublesome than in transportation management. Inter- and intratheater transportation relies on the combined efforts of the regional combatant command and its service components, all of which maintain separate responsibilities and depend on each other for successful operation. Nominally, the Air Force is responsible for providing airlift, the Army is responsible for providing surface lift and port management, and the combatant commander manages theater distribution, through the appointment of one service component as the executive agent.[11]

Although, in principle, the transportation system can operate smoothly when all components are involved, troubles arise when the relative roles of the different contributors in an operation vary substantially. If the Air Force plays a much larger role than the Army, as it did in Operation Noble Anvil, distribution can suffer for lack of clearly defined responsibilities. Despite the mature infrastructure available in Europe, the transportation system during Noble Anvil was slow to start and relied on ad hoc solutions that bypassed standard procedures.[12]

This reflects a disconnect between AEF goals and Air Force efforts to implement them. While the Air Force has gone to great lengths to better tailor force packages and deploy them, it has focused largely on unit-

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The current process does not include activities and procedures for formally allocating scarce resources across competing demands. To meet increasing support needs in a theater preparing for or engaged in a contingency, resources reserved for use in other regions often must be diverted.

based resources and activities and much less so on the equally important theater-based CS aspects. Effective combat support for the AEF relies on rapid and reliable transportation, and efforts must be implemented to establish theater distribution systems under all circumstances—taking full advantage of cooperation with the Army, joint community, and allied and coalition forces, when available, and having the ability to configure alternative systems in situations where these resources are not available.[13]

Just as CS needs and capabilities must be communicated to operations planners, so, too, must they be communicated with other service, joint, and allied or coalition forces. In considering intratheater movement, the Air Force must be capable of determining transportation requirements based on anticipated sortie production goals and understand in what form those requirements should be communicated to the agency responsible for the theater distribution system.

Similarly, CS personnel should clearly define base capability information needed to conduct beddown assessment and be prepared to provide those requirements to coalition or allied forces that may host Air Force forces in a contingency. Such communications with allied and coalition forces could accelerate the site survey and beddown planning activities during the time-critical crisis action planning process.

Absence of Resource Allocation Arbitration Across Competing Theaters

The current process does not include activities and procedures for formally allocating scarce resources across competing demands. To meet increasing support needs in a theater preparing for or engaged in a contingency, resources reserved for use in other regions often must be diverted. However, the capability to assess quickly the impact to readiness, from a global perspective, of moving resources from one theater to another does not exist. For example, the Ammunition Control Point at Hill AFB, Utah, controls the global prepositioning and movement of munitions. However, there are no processes or automated decision tools in place that can provide an operational impact assessment based on the losing theater's operational requirements outlined in its operations plan.[14] While the Execution and Prioritization of Repair Support System has algorithms that can distribute spares from repair depots to different regions

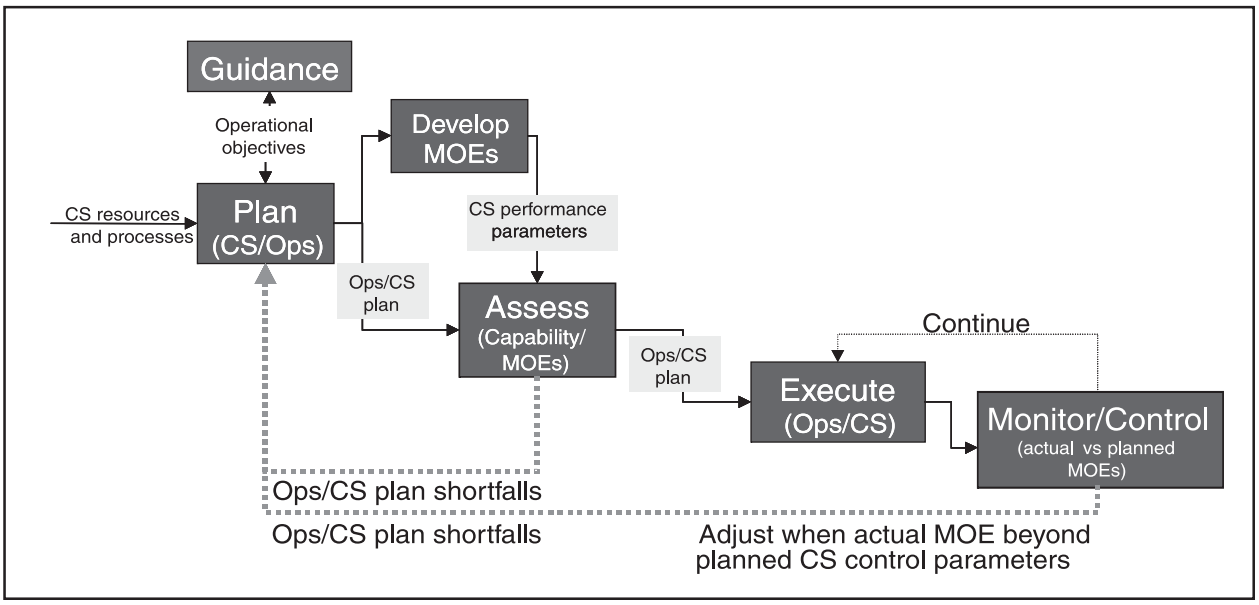


Figure 3. CSC2 *TO-BE* Concept

based on maximizing aircraft availability, current contingency operations tempo data may not be updated on a timely basis, which could affect allocation decisions. Joint Chiefs of Staff (JCS) project codes, which determine priority for spares distribution, are established to help move highest priority cargo more quickly. However, most important cargo for the contingency carries these designators, and thus, the priority system reverts to a first-in first-out system. This can be particularly detrimental when high-demand, low-density spares are considered. While the Centralized Intermediate Repair Facility (CIRF) concept[15] has great potential for more effectively managing constrained resources, it is important to note that no formal process or tools exist to prioritize the repair sequence and allocation of these assets from a global perspective. Other commodities lack even a central authority for resource allocation. In this instance, competing resource issues are resolved in an ad hoc fashion that eventually must be settled at the JCS level.

The TO-BE concept integrates operational and CS planning in a closed-loop environment, providing feedback on performance and resources.

CSC2 Concept for the Future—The *TO-BE* Concept

The High-Level CSC2 Process Template

The *TO-BE* concept integrates operational and CS planning in a closed-loop environment, providing feedback on performance and resources.[16] Figure 3 illustrates the elements of these concepts in a process template, which can be applied through all phases of an operation, from readiness through deployment, employment, and sustainment, as well as redeployment and reconstitution. It centers on integrated operations and CS planning and incorporates activities for continually monitoring performance and dynamically making adjustments.

Some elements of the process, on the left side of Figure 3, are accomplished in planning for operations. The process centers on integrated operations and CS planning and incorporates activities for continually monitoring and adjusting performance. A key element of planning and execution in the process template is the feedback loop that determines how well the system is expected to perform (during planning) by developing and monitoring measures of effectiveness or is performing (during execution) and warns of potential system failure. It is this feedback loop that tells CS planners to act when the CS plan and infrastructure should be reconfigured to meet dynamic operational requirements, during both planning and execution. The CS organizations will need to be flexible and adaptive to make changes in execution in a timely manner.

The feedback loop not only drives changes in the CS plan but also might call for a shift in the operational plan. For the CS system to provide timely feedback to the operators, it must be coupled tightly with their planning and execution processes and systems and provide options that will result in the same effects yet cost less in CS terms. Feedback might include notification of missions that cannot be performed because of CS limitations.

Integrating the CSC2 Process Across All Phases of Operational Planning

The planning activities reflected in Figure 3 occur across the spectrum of operations, as illustrated in the mid-level *TO-BE* processes shown in Figure 4.[17] During day-to-day operations, planning supports programmed flying hours to achieve training objectives and prepare for combat. Planning products are flying schedules and air campaign plans for the operators. Similar products for CS personnel would include such products as depot maintenance repair plans, spares allocation plans, and WRM distribution to support the flying program and air campaign plans. On

From readiness through redeployment and reconstitution, the core process remains the same, but individual information flows vary, and plans and assessments become more refined through each phase.

the installation support side, planning products center on infrastructure operation and maintenance, utility operations, and personnel service activities like lodging, dining, and mortuary affairs. During wartime or contingency operations, combat execution is prepared in the crisis action planning process, with similar products and plans produced in a time-compressed environment. For both peacetime and wartime planning, the focus of combat support should be production of installation support and sorties.

From readiness through redeployment and reconstitution, the core process remains the same, but individual information flows vary, and plans and assessments become more refined through each phase. For example, theater and unit capability assessments are performed constantly, beginning in peacetime. The assessment results feed the budgeting and planning processes that allocate funds to programs and redistribute other resources as required for the Air Force to fulfill its Defense Planning Guidance responsibilities. In this example, the assessment results are at a global level and will be used to make strategic resourcing decisions. As a world situation develops, the relationship between CS and operations capabilities feeds into the crisis action planning process and contributes to the development of a suitable course of action. Based on new information (for example, refined operations requirements, known threats, better known theater capabilities), assessments are reaccomplished, the CS plan is refined, and infrastructure configured as necessary to support new courses of action. As a result of the course of action and these CS configuration actions, the relationship of CS capabilities to operations capabilities is again refined to feed into the development of the joint air operations plan; master air attack plan; and eventually, air tasking order. The assessment capabilities and feedback loop enable the iterative planning with operations. This process continues into employment and sustainment and can be observed for the other blocks in the planning and execution process.

Recommendations to Meet the Future State

The *TO-BE* concept presents CSC2 process elements designed around the needs of the AEF: operationally relevant, rapid, and responsive. To

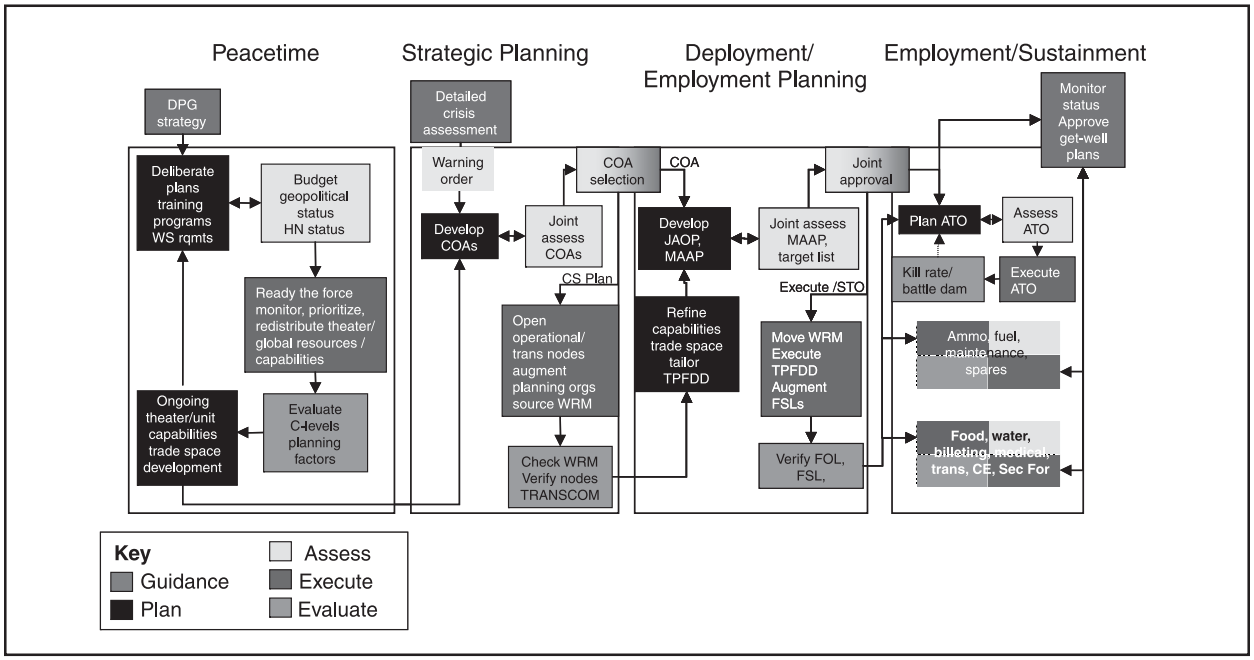


Figure 4. Midlevel Detail of *TO-BE* Process

improve the existing process performance and achieve process changes necessary to implement the *TO-BE* CSC2 concept, fundamental modifications to several *enabling mechanisms*—including doctrine and policy, organizational responsibilities, information systems, and training and education—must be made. Some of the specific implementation actions are outlined in "CSC2 Architecture: Supporting Expeditionary Airpower," in this publication.

The TO-BE concept presents CSC2 process elements designed around the needs of the AEF: operationally relevant, rapid, and responsive. To improve the existing process performance and achieve process changes necessary to implement the TO-BE CSC2 concept, fundamental modifications to several enabling mechanisms—including doctrine and policy, organizational responsibilities, information systems, and training and education—must be made.

Notes

1. James A. Leftwich, et al, *Supporting Expeditionary Aerospace Forces: An Operational Architecture for Combat Support Execution Planning and Control*, RAND, MR-1536-AF, Santa Monica, California, 2002.
2. Research at RAND has focused on defining the vision and evaluating options for an ACS system that can meet AEF operational goals. See Galway, et al, *Supporting Expeditionary Aerospace Forces: New Agile Combat Support Postures*, RAND, MR-1075-AF, Santa Monica, California, 2000. Additional research has identified the importance of CSC2 within the AEF ACS system. See Tripp, et al, *Supporting Expeditionary Aerospace Forces: An Integrated Strategic Agile Combat Support Planning Framework*, RAND, MR-1056-AF, Santa Monica, California, 1999.
3. The phases of operations include peacetime operations and readiness preparation, deployment, employment and sustainment, redeployment, and reconstitution.
4. Joint Pub 1-02, *DoD Dictionary of Military and Associated Terms*, 12 Apr 01.
5. Air Force Doctrine Document 1, *Air Force Basic Doctrine*, 1 Sep 97.
6. Col Ed Groeninger, PACAF 502/CC, 8 Mar 01.
7. Lt Col Stephen Luxion, HQ CENTAF A3/A5, 9 Feb 01; Van Hazel, Seventh Air Force operations analyst, 10 Dec 01; Maj Parker Northrup, Seventh Air Force Air Operations Group, 10 Dec 01; Maj Steen, PACAF/XPXX, 17 Dec 01; Lt Col Levault, Thirteenth Air Force A3/5, 13 Dec 01.
8. Luxion, et al. In some CS areas, such as those dealing with supply of spare parts, the community has been able to express how a lack of spares impacts weapon system availability or engine and pod availability. This community also can assess how spares availability may impact projected weapon system availability.
9. Luxion, et al, and Joint Expeditionary Forces Experiment 99 and 00 final reports.
10. Regional supply squadrons (RSS) have visibility of spares, with the exception of bench stock, of all units deployed to their area of responsibility (AOR). There are seams, however, in this visibility. As an example, consider a bomber island, Diego Garcia, located in the PACAF AOR but supporting CENTAF operations. The PACAF RSS had visibility of tankers deployed to Diego Garcia but not bombers deployed from ACC. Thus, two reachback systems were used. Furthermore, the status and condition of support equipment held as war reserve materiel at an FOL is not as well known.
11. Joint doctrine specifies that the component with the preponderance of force may be delegated the responsibility for developing and managing the theater distribution system (TDS). In Enduring Freedom, the Air Force was formally delegated TDS responsibility. It long has been the assumption that the Army would have responsibility for TDS, but joint doctrine allows the combatant commander to delegate this responsibility as outlined above. There are current efforts underway to allow the Defense Logistics Agency to assume executive agent responsibility for establishing end-to-end distribution responsibilities for medical, construction, fuels, and subsistence commodities. Other options would call for USTRANSCOM to assume end-to-end distribution responsibilities. This is an area that requires a great deal of attention because of the Air Force's reliance on rapid resupply.
12. Feinberg, et al, *Supporting Expeditionary Aerospace Forces: Lessons from the Air War Over Serbia*, RAND, MR-1263-AF, Santa Monica, California, 2002.
13. USAFE has created a theater distribution management center in cooperation with EUCOM to expedite shipments to end users through USAFE APODs.
14. Lt Col Carl Puntureri, JCS/J4 Munitions and NBC Defense Equipment, 23 Feb 01.
15. Robert S. Tripp, et al, *Supporting Expeditionary Aerospace Forces: An Integrated Strategic Agile Combat Support Planning Framework*, RAND, MR-1056-AF, Santa Monica, California, 1999.
16. Elements of these concepts were described in the Air Force C2 CONOPs, Vol III, and the AFMC C2 CONOPS, as well as Pyles and Tripp, *Measuring and Managing Readiness: The Concept and Design of the Combat Support Capability Management System*, RAND, N-1840-AF, Santa Monica, California, 1982.
17. More details can be found in Leftwich, et al.

AFLMA 2003

Partnerships

The Right Team

Partnering, partnerships, strategic partnerships—those are some interesting words. You've probably heard them bantered about frequently during the last few years. Likewise, you've probably seen a variety of briefs, books, pamphlets, or handouts where organizations told you about their partnerships.

Partnering, partnerships, strategic partnerships—those are some interesting words. You've probably heard them bantered about frequently during the last few years. Likewise, you've probably seen a variety of briefs, books, pamphlets, or handouts where organizations told you about their partnerships.

Have you ever found yourself thinking *yeah, right*? Or saying *all eyewash*? Simply renaming a traditional relationship with another organization does not make a strategic partnership. Merely identifying our daily efforts with another Air Force organization as *teaming up* is not our approach. Rather, we recognize partnerships as a needed tool to make things such as Agile Combat Support (ACS) and expeditionary airpower a reality.

We use them to give us the capabilities we don't have, and we use them to be able to do—or do better—some of the things listed below.

- Finding those private sector practices that benefit Air Force logistics
- Finding ways to improve resource management
- Integrating new or emerging technology
- Making Air Force logistics streamlined and more responsive
- Improving Air Force logistics simulation and modeling

Our strategic partnerships include three of the most well-known research corporations: RAND, Synergy, and the Logistics Management Institute (LMI). These partnerships are well-established and growing. We're working with RAND on a variety of Agile Combat Support expeditionary airpower issues and problems. Our efforts with LMI are making Air Force supply systems leaner and more responsive. Our partnership with Synergy will improve logistics modeling and simulation support. These partnerships were essential to our support of Global Engagement VI and will be just as valuable as we design the logistics play for future exercises and wargames.

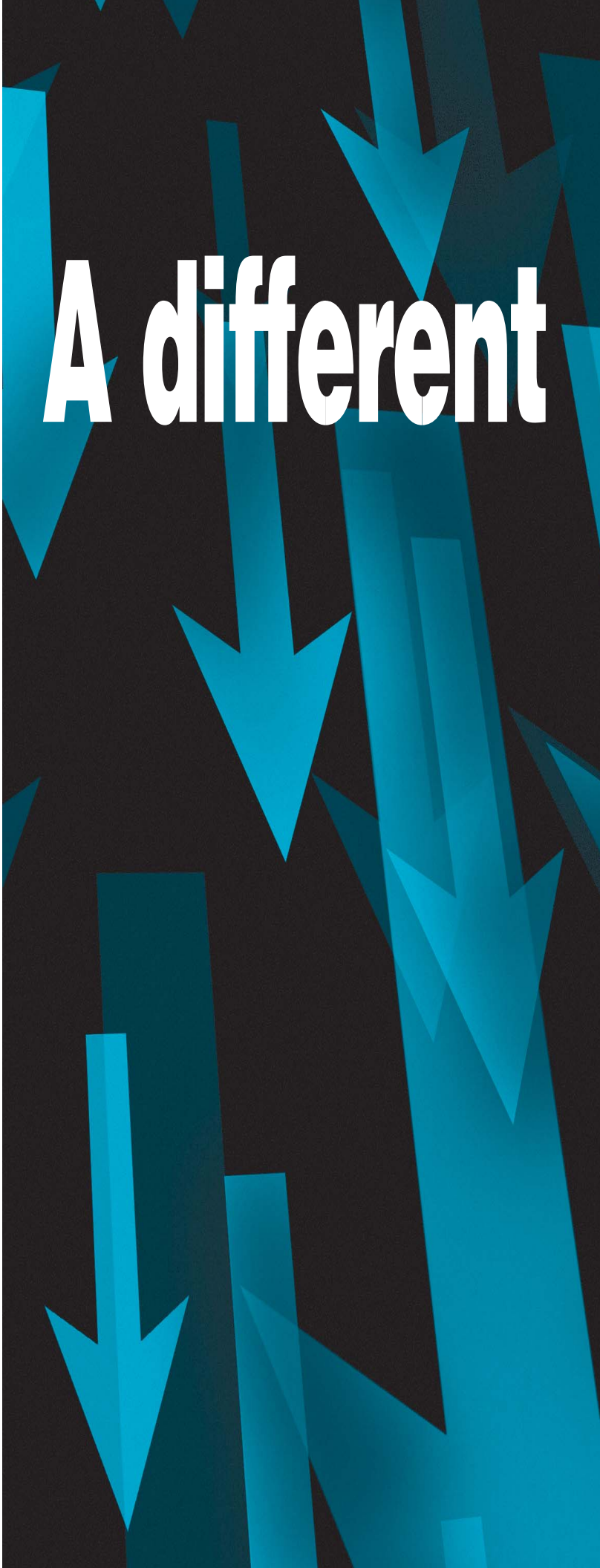
Look into your crystal ball. What do you see? Do you see change? We think we do. We think we see the kind of change we've seen the last 8 years: the Secretary of Defense-directed sweeping program to reform the business of the Department of Defense; defense reform initiatives that mandated the use of business practices used by American industry to successfully become leaner, more flexible, and more competitive; the National Military Strategy—Shape, Respond, and Prepare Now; Global Engagement, the Air Force segment of *Joint Vision 2010*; Agile Combat Support; and the Chief's Logistics Review. Our partnerships help us respond to change, and perhaps more important, they help us anticipate change.

Major Strategic Partners

Expeditionary Airpower Studies
RAND

Wargames and Exercises
Synergy

Inventory and Supply Chain Management
Logistics Management Institute



way of thinking

generating solutions today,
shaping tomorrow's logistics

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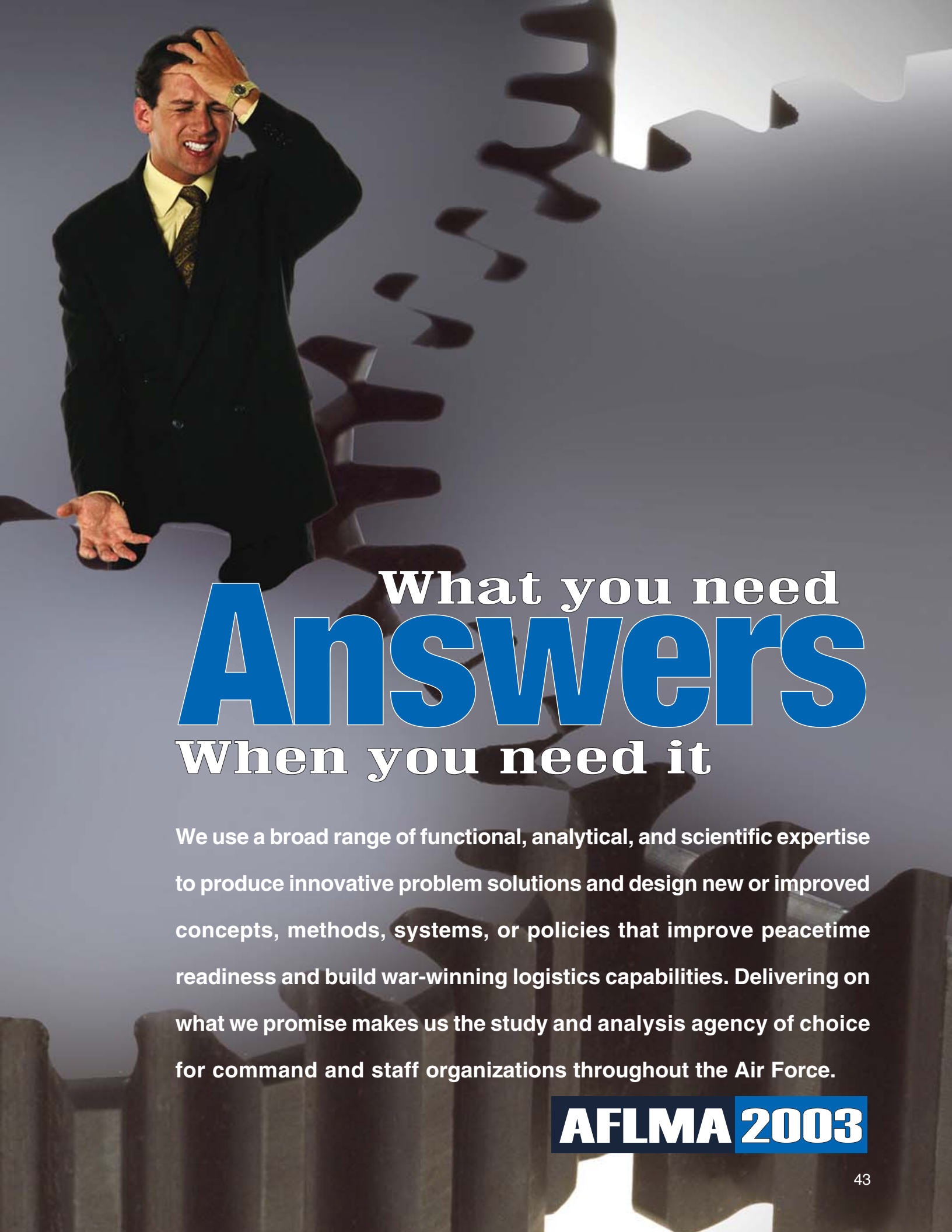
What you need
Answers
When you need it
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AFLMA 2003

Anyone can submit a proposed project, problem, or area for study to the AFLMA, but it must be channeled through the appropriate command LG or the Council of Directors (Air Staff directors). The CoD replaced the Logistics Studies Steering Group as the principal senior-level Air Force body responsible for reviewing and prioritizing logistics studies efforts. Before a study or research effort can be started, it must be sponsored by a command LG or CoD member.

You've just had your fifth call in the last month about why the wings can't get spare parts for the *zamboni loader* (the zamboni loader is used to move *hardened phasetrons,* and phasetrons are no good if you can't move them). Your boss is screaming, his boss is screaming, the wing commanders are screaming, the major command commander now *knows you personally*, and to make matters worse, your dog even gives you dirty looks when you come home. You've checked with your operational analysis folks and some of the operational analysis folks in the wings, and no one has any answers. During your last call, the chief of analysis mentioned something called the AFLMA. After you hang up, you find yourself wondering: What's an AFLMA? How do I get the AFLMA to take on this problem? How much will it cost? How long will they take? What do they produce?

First of all, the AFLMA—Air Force Logistics Management Agency—is located at Maxwell AFB, Gunter Annex, Alabama (for 2004 in temporary facilities at Maxwell AFB, Alabama). We're a logistics problem-solving agency. Within the Agency, we have four product divisions: Maintenance and Munitions, Supply, Contracting, and Logistics Readiness, along with the Logistics Analysis Division. The Analysis Division provides state-of-the-art and leading-edge computer support, analysis, and modeling and simulation capabilities.

Anyone can submit a proposed project, problem, or area for study to the AFLMA, but it must be channeled through the appropriate command director of logistics (LG) or the Council of Directors (CoD). Before a study or research effort can be started, it must be sponsored by a command LG or CoD member. Upon receipt, the proposed study undergoes an extensive preliminary analysis and is submitted to the AFLMA Commander for approval. If we can't accomplish the project, we'll suggest other agencies that may be better suited for the task. When a project is accepted for study, one of our project managers assembles a cross-functional team to study the problem. Together, the functional experts and analysts ensure project results are sound, logical, and practical. Additionally, a multidisciplined approach helps prevent functional suboptimization. We don't want a proposed solution to a maintenance problem to create supply or transportation problems. As part of the project effort, we regularly update the organization or activity that proposed the study, along with the project sponsor. When the project is completed, the Agency provides the project sponsor with a detailed report that outlines the problem, provides a solution or solutions, and makes specific recommendations. Many of our projects are completed in 6-9 months. However, when necessary, we can complete an effort in less than 6 months. The sponsor is responsible for implementing the solution or recommendations. All our services are free to Air Force organizations.

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- Lessons Learned from Current World Situation
- Analysis of TP1/999 Shipments in the AMC System

Maintenance

- Exploiting Automated Information/Serialized Number Tracking Technology
- Standardized Maintenance Production Capability Model
- Maintenance Manpower Authorization Assessment
- Evaluate Support Equipment Warranties
- *Munitions Manager's Reference Guide* Update
- Condition-Based Maintenance Plus
- Capability Cost of Unfunded Maintenance Positions
- Cartridge- and Propellant-Actuated Devices
- Evaluation of Total Life-Cycle Cost System Management Plans
- Low-Observable Maintenance Manpower

Text in brown indicates a project is in work or has been completed.

Supply

- Force Activity Designator Code Analysis for Training Aircraft
- Consumable Readiness Spares Package Versus Mobility Bench Stock
- Credit Return Policy
- Virtual Inventory Control Point Buy and Repair Feedback System
- Readiness-Based Leveling (RBL) Guide for Contractors
- Repair Prioritization for Items Not Included in the Execution and Prioritization of Repair System
- Depot Supportability of Surge Parts Requirements
- Depot Maintenance Responsiveness Affects Mission Capability
- Cost Analysis to Lease Cryogenic Plants
- Defense Logistics Agency (DLA) Demand Data
- Readiness Spares Package Fielding Cycle
- Equipment Prioritization
- Oklahoma City Air Logistics Center Stub Time Proposal on Standard Base Supply System Reporting
- Alternative Stockage for Low-Demand, MICAP Items Generating Aircraft
- MICAP Cause-Code Analysis
- RBL Zero-Demand Study
- *Supply Manager's Handbook*
- Contingency Flag Follow-on Study
- DLA Charges for Distribution, Inventory, and Warehousing
- DLA General Services Division Obligation Authority Decisions
- Level on First Demand for Shelf-Life Items
- Supply Command and Control
- *Fuels Manager's Handbook*
- Advanced Planning and Scheduling Pilot
- Advanced Planning and Scheduling Proof of Concept
- Recoverable Assembly Management Process System
- DO35K Retention Policy
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- Common Operating Picture
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- MSD Price Change Implementation and Control
- Air Force Spares Stratification
- Interchangeable and Substitute Group Problems with ND National Stock Numbers
- Bill of Material Replacement Factors

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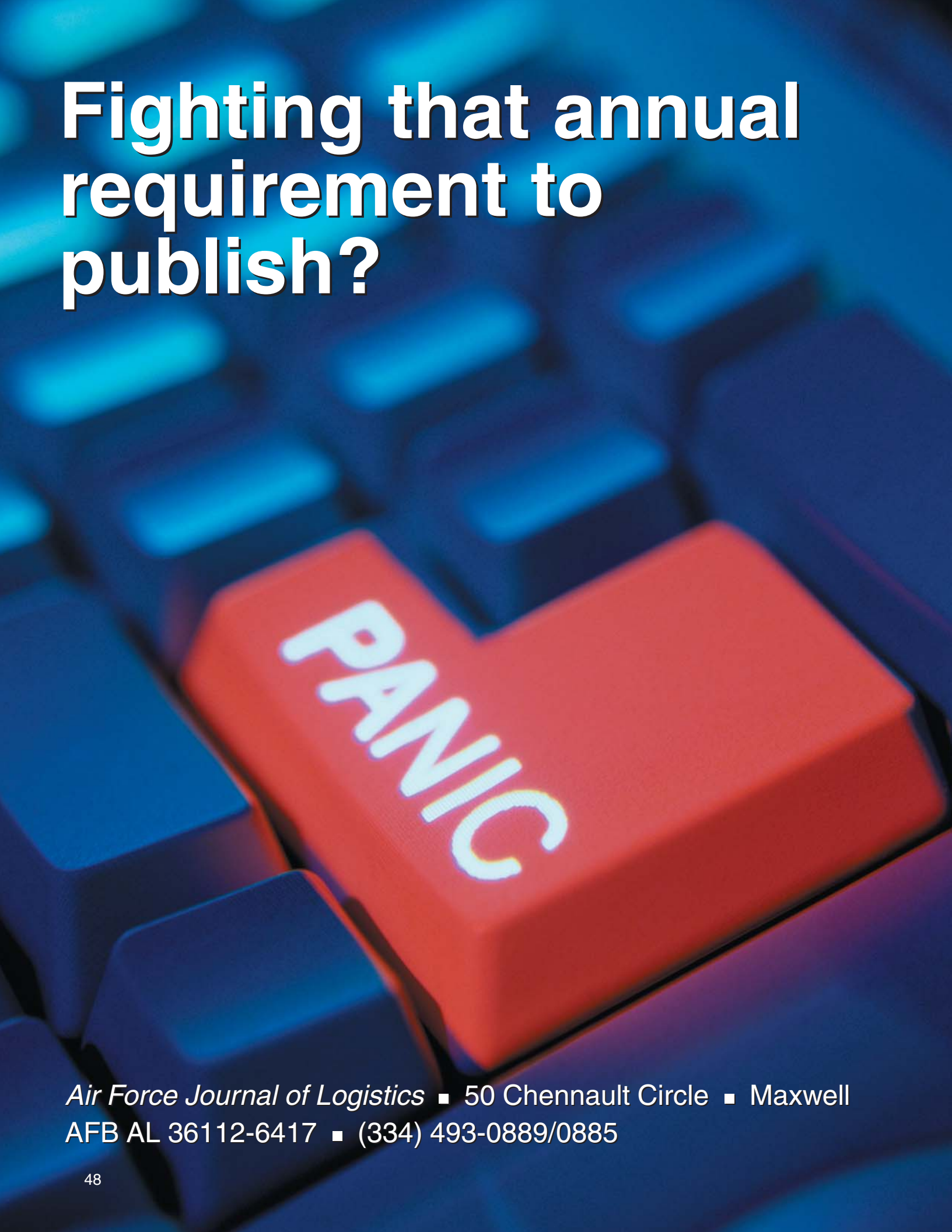

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Selected Reading
Air Force Journal of Logistics

Customer-Oriented Leveling Technique

Captain Jason Vinson, USAF
Major Kevin Gaudette, USAF

We have probably all heard it (and maybe even said it once or twice): "I would have been able to produce if only I had the parts" or "It isn't my fault the aircraft isn't on schedule, supply is out of the washers I need, and the supplier is on back order as well." Oftentimes, these type comments seem like finger pointing, but the numbers indicate they are rooted in truth. In May 2001, there were more than 32,000 consumable units back ordered against end items or higher assemblies in an awaiting parts status.[1] Examples are all too common in which relatively inexpensive consumable parts hold up the repair of an expensive reparable part. The Defense Logistics Agency (DLA) supplies upwards of 90 percent of the consumables used in aircraft programmed depot maintenance (PDM) and component repair, which takes place primarily at Air Force Materiel Command's (AFMC) three air logistics centers (ALC). Under contract by AFMC's Directorate of Logistics, BearingPoint (formerly KPMG Consulting) cited consumable-item support to depot maintenance in its Constraints Analysis Program study as one of the key limiting factors impacting the depots.[2]

The Customer-Oriented Leveling Technique (COLT) was developed by the Management Sciences Division of AFMC's Directorate of Plans and Programs in conjunction with the Supply Division of the AFMC Directorate of Logistics, with the goal of improving availability of consumable parts supplied by DLA. These parts allow maintainers at the air logistics centers to complete PDM on schedule and get reparable assets out to the field. This article outlines the history that led to the development of COLT, walks through the details of the model's algorithms, touches on some key paradigm shifts that had to occur prior to implementation, and highlights performance improvements already realized.

Background

Discussions and studies regarding how to treat consumable parts are nothing new. The article "Management of Air Force Depot Consumables: A Brief History and Taxonomy" goes into a more detailed description of how these parts have been treated over the last 10 years.[3] We, therefore, limit our discussion here to a summary of the major milestones that led to the development of COLT.

A traditional economic order quantity (EOQ) model was used until 1998 to determine the quantity of each part to be stocked at the retail echelon of supply and when orders should be placed to resupply those stocks. This approach took into account such factors as the historical demand rate and unit price for each item, as well as assumed values for ordering and holding costs. A 1998 study by the Air Force Logistics Management Agency (AFLMA) showed that, in some special cases, retail support for consumable parts could be improved by ordering more frequently from DLA than the EOQ approach would dictate.[4]

In response to the AFLMA study, AFMC changed its EOQ ordering approach to a new policy of one-for-one ordering on all DLA-managed consumable parts. This new policy called for the air logistics centers to order stock daily from DLA to resupply their shelves based on the number of assets consumed each day. The policy provided DLA with a more accurate picture of its customers' true demand streams, but it was not in line with the recommendations laid out in the AFLMA study, which defined specific criteria as to when the new policy should and should not be used.

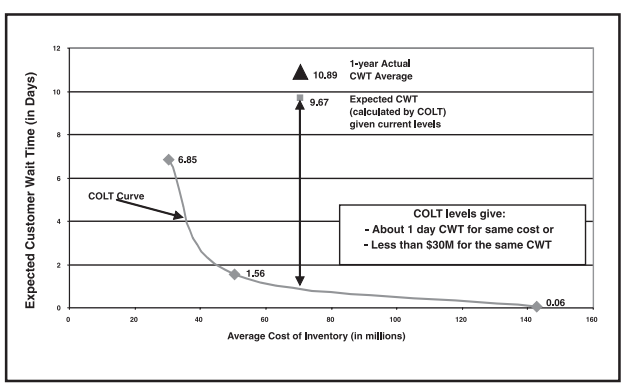


Figure 1. Effects of Inventory Investment on Customer Wait Time

An added problem with one-for-one ordering was that, in execution, each of the air logistics centers had its own approach for calculating stock levels. All three used a *days of stock* approach to set these levels, but their criteria for determining the number of days were drastically different. One air logistics center set the same number of days on all stock numbers, whereas another used a certain number of days for all items under a set dollar value and a different number of days for all other parts. The third had yet another approach that looked at not only the cost of the items but also the number of requisitions each part had experienced. AFMC implemented one-for-one ordering simultaneously across the command, but in practice, there were three very different approaches being used for determining stock levels for consumable parts.

In 2000, an integrated product team (IPT)—led by the AFMC Directorate of Logistics and composed of members from the AFMC Directorate of Plans and Programs, each of the air logistics centers, and DLA—was formed to improve consumable parts support to the depots. This team examined the effectiveness and shortcomings of each of the current practices and explored alternatives that might yield the desired improvement. Analysis showed each of the current approaches to be suboptimal and led to the development of COLT, a marginal analysis model that ties together funding, customer demand, and DLA supportability when setting stock levels.

COLT Basics

Like Air Force reparable supply systems, COLT uses a marginal analysis technique to achieve the best possible objective while satisfying constraints. In this case, the objective is to minimize customer wait time (CWT) for consumable parts, while the constraint is operating within set funding limits. As long as the model has money to spend, it will increase the stock level of the part that, relative to all other parts, will yield the largest return on investment. Simply put, it maximizes the *bang per buck*. The *buck* is simply the cost of the item in question, but the *bang* piece of the equation deserves a bit more explanation.

COLT is said to minimize CWT for ease of communication, but a more accurate statement is that the model minimizes the *demand weighted* CWT per dollar spent. This objective ensures the result of a COLT run is the minimum average CWT across a population of parts for a given level of inventory investment. The *bang*, then, is defined as the change in expected CWT, multiplied by the demand rate when the stock level is increased by one unit. Mathematically, this product of demand rate and expected CWT is equivalent in definition to time-weighted expected back orders (EBO).

$$EBO = CWT * DDR$$
$$\text{Where } DDR = \text{Daily Demand Rate}$$

At its core then, COLT's objective of minimizing demand-weighted CWT is identical to the goal of readiness-based leveling: to minimize expected back orders.

Assumptions and Inputs

COLT, in its evaluation of expected CWT, makes a series of assumptions regarding the behavior of consumable items. First, the demand during lead time is assumed to be distributed as a negative binomial random variable, as opposed to the more commonly used Poisson distribution. A study by Deemer and Kruse offers evidence that justifies the use of the negative binomial distribution in lieu of the Poisson, particularly in cases where the variance of demand exceeds the mean.[5] Second, variance in lead-time demand is assumed to be a function of not only the demand variability but also the variability in the lead time itself.[6]

In addition to making some new assumptions about the population of items when setting stock levels, COLT considers three new factors. All three are provided by DLA and relate to the level of support it expects to provide to its retail customers. The first factor is the expected stockage effectiveness, an estimate by stock number, of the percentage of time DLA expects to have an item available when it is requested. This estimate is based on the wholesale stock level, historical demand rates for the item, and expected resupply times. Second, DLA provides a historical average of the amount of time Air Force customers have had to wait for each part when back ordered, called the conditional delay. Last, DLA indicates the location where each item is stocked. Many items are stored onsite at the air logistics center, and in other cases, parts are stored at central inventory control points. Items stored onsite are assumed to have a shorter shipping time than those that must be delivered from offsite locations. Together, these three factors are used to compute the expected wholesale delay time or pipeline time. For the first time in the history of Air Force consumable support, the model that sets stock levels accounts for the fact each item receives a different level of performance from the wholesaler.

COLT uses these assumptions and factors in conjunction with the demand rates and unit prices from the ALC stock control system, D035K, to compute a *bang per buck* for each stock number. It then allocates a set inventory investment to minimize the expected CWT across all consumable items at the depot. At the completion of a run, COLT outputs a flat text file of level change transactions fed into D035K to put the new stock levels into effect.

Essentially, COLT's approach identifies those parts that have good expected wholesale support, so their retail stock levels can be decreased without appreciably impacting the support felt by the maintenance customer. The savings from the reduction in these healthy retail stock levels are then reinvested in other items that yield a better overall return on the dollar in terms of CWT. In short, COLT reallocates levels so the right parts are ordered at the right times. This approach has a dramatic effect on customer support, as shown in Figure 1.

The triangle in the figure shows the actual AFMC-wide CWT prior to implementation of COLT (fiscal year [FY] 2000), while the square below it shows the COLT estimate

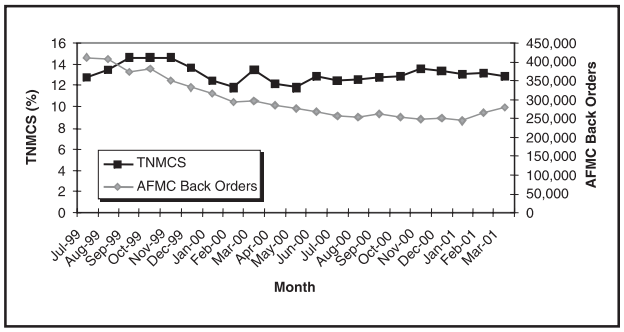
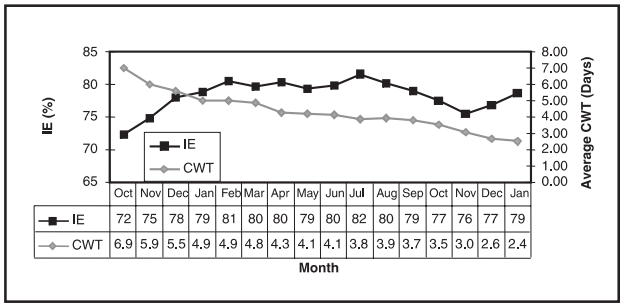


Figure 2. Comparison of AFMC Back Orders and Fleetwide TNMCS Supply Rates—July 1999 through March 2001



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
IE	72	75	78	79	81	80	80	79	80	82	80	79	77	76	77	79
CWT	6.9	5.9	5.5	4.9	4.9	4.8	4.3	4.1	4.1	3.8	3.9	3.7	3.5	3.0	2.6	2.4

Figure 3. Comparison of AFMC Issue Effectiveness and CWT—October 2001 Through January 2003

of CWT given the stock levels at that time. A comparison between the FY00 CWT and the COLT-generated cost curve shows the effects of reallocating the stock levels using a marginal approach. With the same level of funding, the CWT potentially could be reduced from 10.89 days to about 1 day. In the real world, of course, the actual CWT probably would be slightly higher than the estimate. Still, even a CWT of 2 days would represent a reduction of nearly 82 percent or about 9 days per request. Similarly, the FY00 CWT of 10.89 days could be achieved with less than $30M in inventory, less than half the level at that time.

Setting Affordable Levels: A Paradigm Shift

There were two key challenges that had to be overcome during the sale and implementation of COLT. The first hurdle had nothing to do with the level-setting algorithm and everything to do with how much money the model was told to allocate. Prior to this new approach, D035K set stock levels for consumable parts independent of the General Support Division (GSD) budget. Oftentimes the result, as the air logistics centers approached the end of a fiscal year, was the discovery that the current rate of obligating funds could not be supported and some requisitions would have to be suppressed until the next fiscal year. In some cases, this merely delayed some stock replenishment. In many, however, parts needed immediately for repairs could not be ordered until the following year's funds became available.

In COLT, the integrated product team decided to take a different approach by only setting affordable stock levels.

Simply stated, the model only allocates the available money in the General Support Division when it sets stock levels. The model is run at least quarterly, often monthly, to capture deviations from the expected rate of obligation. An obligation is the money used by the air logistics center to buy assets from DLA. When actual obligations exceed expectations, COLT decreases some stock levels to slow the future *burn rate*. A decreased level will result in the sale of an asset to the customer that does not have to be resupplied—no obligation. When the actual obligations come in under expectations, the model conversely increases stock levels, building additional inventory with the remaining obligation authority to further lower the expected CWT. The one caveat in the latter case is that COLT also ensures the allowed ratio of obligations to sales, or unit cost target, is met, which keeps the size of the inventory from growing out of control.

The concept of only setting affordable levels is a significant departure from past practices but helps COLT maximize support to the customers. As stated in the previous paragraph, when COLT perceives that the current rate of obligations will overextend the budget, it decreases stock levels to get on track. This action prevents obligation authority from being used for stock replenishment that could be better used to minimize potential work stoppages caused by a lack of needed consumable parts.

New Metric: CWT

The second hurdle to implementation of the model dealt with the metrics used to evaluate its success. To this point, the traditional supply metrics of issue effectiveness (IE) and stockage effectiveness have not been mentioned. Instead, we have focused on CWT. This point proved to be a major stumbling block for the decisionmakers at the air logistics centers, whose assessments are based, in part, on these traditional measures.

Issue effectiveness, by definition, is nothing more than a measure of the percentage of time depot supply has a part immediately available when it is requested by depot maintenance. The Integrated Product Team contended that this measure does not provide an accurate representation of depot supply's performance because it neglects to account for the duration of resulting back orders. To illustrate this point, it is useful to look at a simple example. Suppose we have a part for which, over its last ten requisitions, the assets were available in eight cases and the remaining two were back ordered. Issue effectiveness during this time was 80 percent. For the two back orders, let us assume that it took 10 days to get each from DLA. Now suppose, over the next ten requisitions, again, the assets were only available in eight cases so issue effectiveness remains at 80 percent. The difference in this case, however, is that, instead of taking 10 days to get the back-ordered assets, it now took 20 days each. Clearly, support has gotten worse on this part, but looking at issue effectiveness alone does not alert us that anything is wrong. In fact, from July 1999 to March 2001, the total number of AFMC back orders was reduced by 32 percent by focusing on issue effectiveness, while the total not-mission capable-supply rate remained relatively constant at about 12.9 percent (Figure 2). Clearly, focusing on issue effectiveness was not having the desired impact on the bottom line.

CWT, as defined by the integrated product team, takes care of this problem, without losing the information contained in the IE metric. All items immediately available are given a CWT of zero, and the back-order days are captured for all parts that have to be ordered. Thus, the equation for CWT looks like this:

$$CWT = [IE * 0 \text{ days}] + [(1 - IE) * (\#\text{ back-order days})]$$

Returning to our example, CWT over the first ten requisitions is:

$$CWT = [80\% * 0 \text{ days}] + [20\% * 10 \text{ days}] = 2 \text{ days}$$

And over the second set of 10 requisitions:

$$CWT = [80\% * 0 \text{ days}] + [20\% * 20 \text{ days}] = 4 \text{ days}$$

CWT alerts us something is wrong, while issue effectiveness alone misses the mark. Similarly, if the days on back order remain the same as CWT gets worse, we can infer that the percentage of immediate issues must be going down.

Alternate Applications

So far, we have discussed only the use of COLT from the perspective of setting retail stock levels for DLA-managed consumable parts, but there are two other key applications of the model that add value to the new approach—budgeting and allocation.

For the first time in the consumable parts arena, requests for additional funds can be justified using the COLT model. Specifically, the model indicates the expected level of support that will result from the current level of funding and quantifies the support improvements possible with additional funding. For example, an extra $3M in obligation authority will decrease the expected CWT by 30 percent. This ability to quantify the impact of additional GSD obligation authority, coupled with the success the model already has experienced, has made COLT an important tool in the budgeting process.

The next step, after money has been approved for the budget, is to determine how that money should be allocated to the air logistics centers. Historically, this step has been accomplished by looking at the past volume of work done by each air logistics center. COLT now optimally allocates these funds to minimize the expected CWT across the command, rather than just locally at each air logistics center.

Implementation Results

COLT was implemented across AFMC at the beginning of FY02 with CWT as the primary measure of success. Since that time, the average CWT across AFMC has decreased

by 65 percent, from about 6.9 days to less than 2.5 days. Over the same time, issue effectiveness has fluctuated, but CWT has shown a constant improvement.

COLT also has spread the levels more equitably, as mentioned in the previous section. Prior to implementation, the CWT at each of the three air logistics centers was drastically different. Performance at the Oklahoma City ALC was more than twice as strong as that of the Ogden ALC, and the Warner Robins ALC was even worse off than Ogden. Since implementation, performance has improved at all three, but the latter two have improved by a larger percentage. As a result, all three air logistics centers now have about the same expected CWT, less than 3 days on average. COLT achieved this by redistributing some of the funds from Oklahoma City to the air logistics centers that were hurting, at the same time improving the support at the Oklahoma City ALC, albeit by a smaller amount.

To date, COLT has been implemented only for depot consumables within AFMC, but the system currently is being tested for use in base-level supply by the Air Combat Command and Air Education and Training Command. Assuming the results are as encouraging as those at the depots, we may one day use COLT, or a system like it, for all Air Force consumable levels.

Conclusion

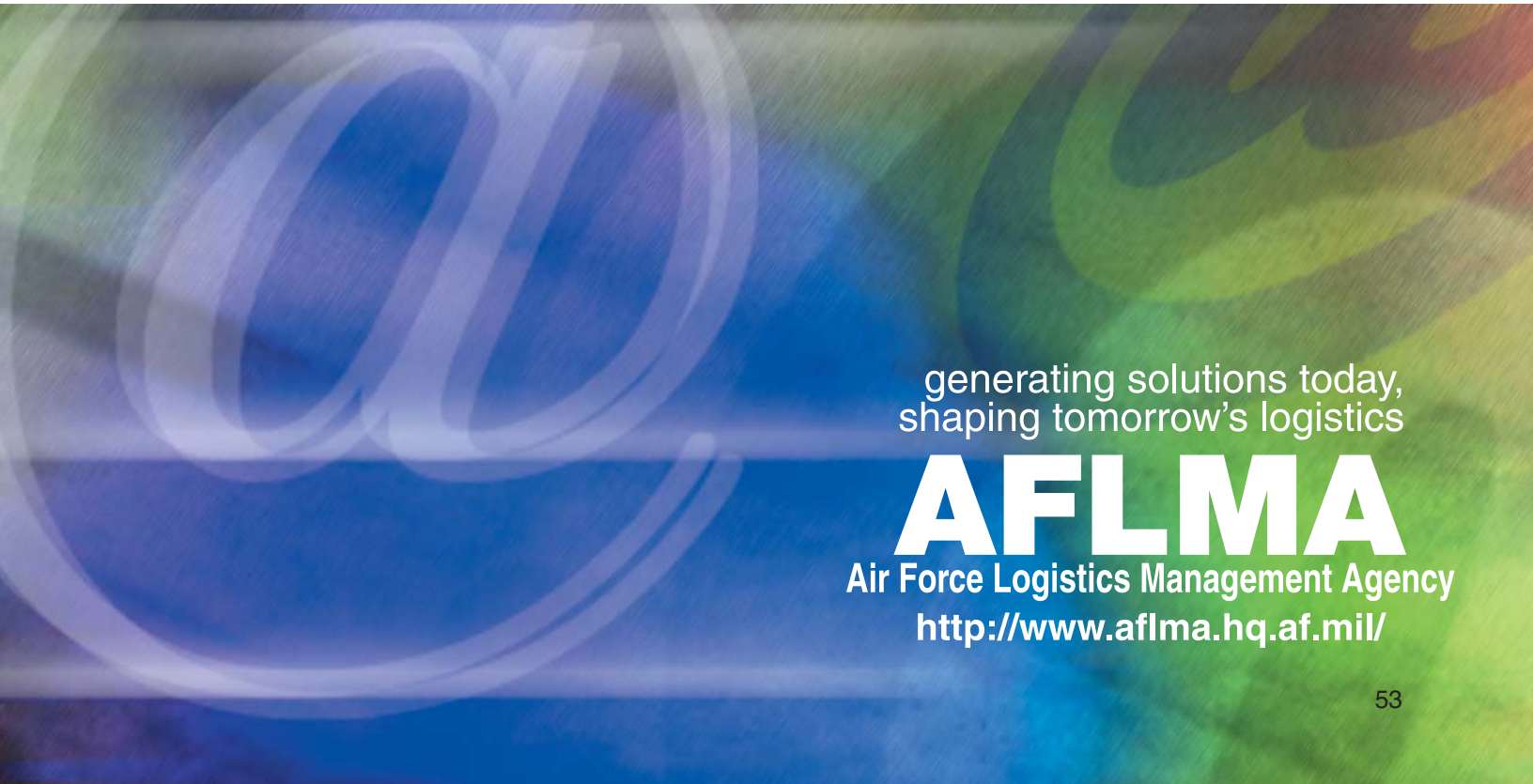
Improving consumable-item support has been a hot topic for many years. COLT was not the first model to deliver an improvement, and it will certainly not be the last. It is simply the next step in the evolution.

COLT has been an amazing success story for AFMC in the area of improving consumable parts support to the air logistics centers—an area that accounts for a relatively small percentage of the Air Force spare parts budget but can have an enormous impact on the ALCs' ability to get airplanes through PDM and repair end items for use in the field. COLT uses a marginal analysis technique to minimize the CWT for consumable spare parts and has achieved a 65-percent reduction in CWT across AFMC since implementation in October 2001. In addition, the tool has been used to generate optimal and defendable funding allocations across the air logistics centers, as well as justify the need for additional funding needed to deliver a continuous high level of warfighter support, such as in the case of depot surge operations in support of the war on terrorism.

COLT uses information about DLA support that is readily available, coupled with the new goal of minimizing CWT, to make smarter decisions about how the Air Force spends its limited GSD budget. These decisions have literally reshaped the entire consumable inventory to buffer more efficiently the level of support depot supply is able to deliver to its depot maintenance customers. It would obviously be great to have all the parts in the world available 100 percent of the time. But in the real world, COLT makes the tough decisions that minimize the amount of back-order time mechanics spend waiting for parts.

Notes

1. Ron Corbett, AWP Metrics presentation, AFMC/LGIL, Apr 02.
2. Kieren Keelty, "Supply Chain Management Constraints Analysis Program Update," AFMC Briefing, Sep 00.
3. Kevin Gaudette, Doug Blazer, and H. Kenneth Alcorn, "Management of Air Force Depot Consumables: A Brief History and Taxonomy," Under review, *Air Force Journal of Logistics*.
4. Buddy Berry, Brad Anderson, Douglas Blazer, John Dietz, and Severine Colborg. "Harmonization of Air Force and DLA EOQ Policies," AFLMA, Maxwell AFB, Gunter Annex, Alabama, Oct 98.
5. R. L. Deemer and W. K. Kruse, "Evaluation of Several VSL/EOQ Models," Army Report AD 781948, May 74.
6. Craig C. Sherbrooke, *Optimal Inventory Modeling of Systems: Multi-Echelon Techniques*, New York: John Wiley & Sons, Inc, 1992.



In Search of The Smoking Gun

Lieutenant Colonel Steven O. Purtle

We had great success in 2003, although we did not always find the smoking gun. We are committed to finding the answer or providing insight that leads to those answers.

My first full year in the job has passed all too quickly. And as I reflect on the accomplishments of the folks in the division, I grow increasingly respectful of the great work the division and AFLMA produce for the Air Force. Our small division conducted nine studies last year, assisting senior Air Force leadership in solving urgent problems that stem from many of the dramatic changes occurring in our community, the Air Force, and the Department of Defense.

What I have learned in the world of studies and analysis is that a very different kind of thinking is required. Maintaining the Air Force viewpoint can be tough because experience, it turns out, can be both an ally and an adversary on the road to finding the smoking gun. But answers can be found, and positive change can be made. And the work of this division has gone a long way in fostering that change.

Early in 2003, the Director of Innovations and Transformation, Air Force Deputy Chief of Staff for Installations and Logistics asked us to evaluate the duties of the aircraft maintenance analyst, given the impacts of anticipated force structure reductions and global trends in information technology. We found that the expected conversion of the maintenance database to Oracle presented the potential to centralize the data and outsource maintenance of the database. A single, outsourced Oracle database could lead to a manpower reduction of up to 165 people.

Another effort was to determine the cost-effectiveness of lifetime warranties. Based on a report from a Warner Robins Air Logistics Center Support Equipment and Vehicle Management Directorate Pacific Air Forces visit that highlighted a history of poor utilization and documentation

Maintenance

of support equipment warranties, our division was tasked to identify possible improvement areas in the warranty process.

First, we identified a sample group of equipment items and reviewed applicable warranty programs to see if they were tracked, documented, and utilized properly. Next, we compared the duration of the warranties on these items to the life expectancy of the item. We then attempted to identify theater-unique issues impacting warranty utilization and studied commercial off-the-shelf (COTS)-procured equipment items to identify any unique warranty issues.

Twenty-four equipment items were identified for study. The items included those that had current warranty programs, as well as those with expired programs, to help identify changes in warranty policies and practices over time.

Our findings showed that warranties on support equipment are not adequately tracked. There are no standard requirements established for the collection, storage, or analysis of warranty data. None of the equipment items studied had warranty support covering the life expectancy of the item. Theater-unique issues abound with several of the pieces of equipment studied. Even though most support equipment (SE) items are not COTS-procured, there are some warranty issues unique to the purchase of COTS support equipment.

During the research of SE warranties, a new Web-based warranty tracking system (WTS) was brought to light. It is the result of a previous Air Force Audit Agency report on warranty issues (project No 00061024 dated 14 December 2000). A review of the WTS shows that it has the potential to resolve many of the process-related issues with warranty utilization, to include warranty program identification, data accumulation, and data analysis information requirements.

We also were asked to perform a comprehensive review of all active duty aircraft, munitions, and missile maintenance authorizations and identify any *noncore* authorizations that do not directly support the warfighter. The Air Force Directorate of Maintenance has been repeatedly called on to provide candidate Air Force specialty

codes, units, and manpower authorizations for consideration for possible conversion to best source (civil service or contract) to support other Air Staff initiatives such as Agile Combat Support for core competencies and the Long-Haul and Human Capital Task Forces. A *core* authorization was defined as an authorization meeting one of the following criteria: (1) deploys with forces, (2) required by law, (3) training or experience that contributes to or enhances Air Force culture and ethos, or (4) difficult for competitors to imitate. We created data filters that, to the Headquarters Air Force Mission Design Series data, when applied in a specific order, identified authorizations not meeting the core definition. The *deploys with forces* filter was applied first; followed by *culture and ethos*; *required by law*; and finally, the *difficult for competitors to imitate* filter. The final listing gave the Directorate of Maintenance 10,351 potential noncore positions to evaluate for conversion to best source. The major command functional managers then worked with the Air Force Directorate of Maintenance to validate each of the authorizations identified.

Another challenge the division faced was a project to document the cost savings associated with Air Force exploitation of serial number tracking and automated information technology capabilities in its information technology. Headquarters Air Force Materiel Command sought to present cost savings and benefits of serial number tracking to support additional funding for propagation of the technology. Our task was to document the cost savings and benefits of serial number tracking by examining the Defense Repair Information Logistics System (DRILS) and Lean Depot Management System (LMDS), systems developed by weapon system managers that use serial number tracking. Unfortunately, relatively little objective, documented evidence of cost savings, cost avoidance, or benefits exists for either the DRILS and LDMS programs. We found many of the savings claimed by DRILS and LDMS were tied to other Air Force cost-saving initiatives. This obscured the true amount of cost savings and cost avoidance brought about by these systems.

In November 2002, the Deputy Under Secretary of Defense for Logistics and Materiel Readiness issued interim policy directing the military services to implement condition-based management (CBM^+) initiatives. In response to this policy, the Air Force Director of Innovations and

2003

Transformation directed AFLMA to perform a comprehensive study for Air Force CBM+ implementation. The study resulted in a clear-cut definition and baseline for Air Force use, as well as a snapshot of CBM+ integration in the Air Force. These findings will aid senior policy makers in clearly defining the approach to CBM+ integration for the next generation of Air Force weapon systems.

What are some of the important issues of 2004? Two big projects on our plate right now concern Air Force unmanned aerial vehicle (UAV) maintenance and the management of cartridge-actuated devices and propellant-actuated devices (CAD/PAD). Department of Defense authorizations for UAV maintenance personnel are forecasted to double by 2010. This escalation dictates that we build a plan to meet this need without stressing critically manned career fields. Our chore is to determine which Air Force specialties (2A, 2E, or 2M) are best-suited to perform UAV maintenance. Currently, Air Force CAD/PAD is managed like an aircraft part or munitions item, depending on the weapon system. We are in the process of mapping how CAD/PAD currently is funded, stored, and managed (as a munitions item). Following this, we will compare how CAD/PAD could be funded, stored, and managed as an aircraft spare to determine the best approach from an Air Force perspective.

As you can see, we had many great successes in 2003, although we did not always find the smoking gun. Even so, we are committed to finding the answer or at least providing insight that leads to those answers.

Completed 2003 Projects

- CSAF Logistics Review): Supporting Implementation and Testing
  LM200100400—Consulting Study
- Air Expeditionary Force Logistics Concept of Operation
  LM199733000—Consulting Study
- Automated Maintenance Data Analysis
  LM200212002—Improvement Study
- F101 Engine Regional Repair Facility Cost-Benefit Analysis
  LM200226800—Improvement Study
- Follow-on Technical Support for Weapons Load Crew Management Program
  LM199812000—Consulting Study
- Support Web Site for Munitions CD-ROM
  LM199924500—Consulting Study
- Cost-Benefit Analysis of Warranties for Support Equipment
  LM200300701—Improvement Study
- Maintenance Manpower Authorization Assessment
  LM200305007—Consulting Study
- Condition-Based Maintenance Plus Initiative
  LM200301800—Improvement Study
- Exploiting Automatic Identification/ Serialized Tracking Technology
  LM200304100—Improvement Study
- Update and Upgrade the *Munitions Manager's Reference Guide*
  LM200300600—Improvement Study

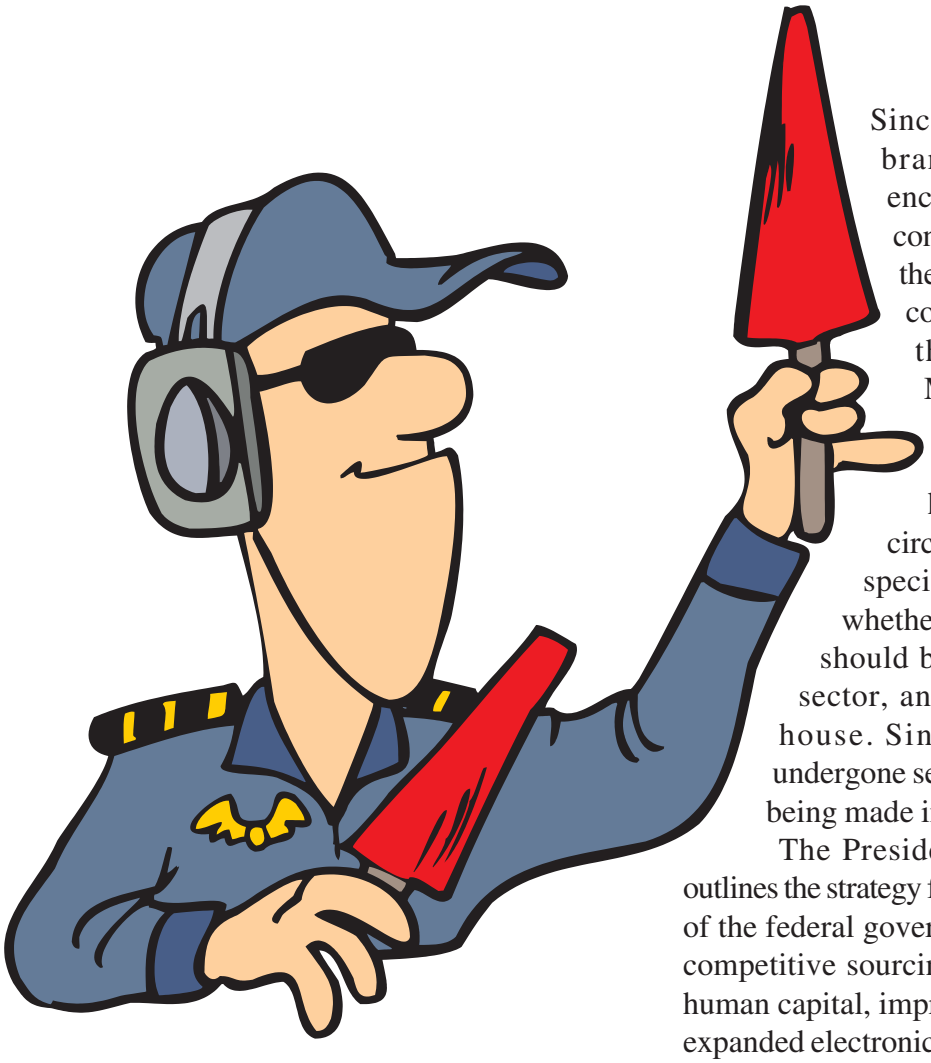
Maintenance Division

- Follow-on Technical Support for Weapons Load Crew Management Program
  LM199812000—Consulting Study
- Support Web Site for Munitions CD-ROM
  LM199924500—Consulting Study
- F101 Engine Regional Repair Center Cost-Benefit Analysis
  LM200327600—Improvement Study
- Low-Observable Maintenance Manpower Study
  LM200215100—Improvement Study
- Cost-Benefit Analysis of Warranties for Support Equipment
  LM200300701—Improvement Study
- Maintenance Manpower Authorization Assessment
  LM200305007—Consulting Study
- Condition-Based Maintenance Plus Initiative
  LM200301800—Improvement Study
- Air Force Mission-Capable Rate and Aircraft Availability Model Study
  LM200301600—Consulting Study
- Exploiting Automatic Identification/ Serialized Tracking Technology
  LM200304100—Improvement Study
- Update and Upgrade the *Munitions Manager's Reference Guide*
  LM200300600—Improvement Study
- Support to RAND for CONUS CIRF Implementation Study
  LM200326700—Consulting Study
- USAF Unmanned Aerial Vehicle Maintenance Manning
  LM200327600—Improvement Study
- CSAF Logistics Review: Supporting Implementation and Testing
  LM200100400—Consulting Study
- Air Expeditionary Force Logistics Concept of Operation
  LM199733000—Consulting Study
- Low-Observable Maintenance Manpower Study
  LM200215100—Improvement Study
- Management of Cartridge- and Propellant-Actuated Devices
  LM200326800—Improvement Study
- Automated Maintenance Data Analysis
  LM200212002—Improvement Study

Maintenance Manpower Authorization Assessment

The Air Force Directorate of Maintenance repeatedly has been called on to provide candidate AFSCs, units, and manpower authorizations for consideration for possible conversion to the best source to support other Air Staff initiatives, such as Agile Combat Support for core competencies and the Long-Haul and Human Capital Task Forces.

Major Steven A. Oliver



Background

Since the 1950s, the Executive branch of government has encouraged federal agencies to contract goods and services from the commercial sector when it is cost-effective to do so. In 1966, the release of Office of Management and Budget Circular A-76 formalized the policy, and in 1979, a handbook supplemented the circular. The handbook contains specific procedures to determine whether or not commercial services should be performed by the private sector, another federal agency, or in house. Since 1979, the circular has undergone several changes, with the latest being made in May 2003.[1]

The President's *Management Agenda* outlines the strategy for improving the management of the federal government in five specific areas: competitive sourcing, strategic management of human capital, improved financial performance, expanded electronic government, and budget and

performance integration. In the area of competitive sourcing, the *President's Management Agenda, Fiscal Year 2002*, announced in the summer of 2001, directs federal agencies to convert directly or compete, through cost-comparison studies, 15 percent of their total fiscal year (FY) 2000 inventories of commercial activities by the end of FY03 with the ultimate goal of at least 50 percent by the end of FY08. The Department of Defense (DoD) identifies these positions as part of the *1998 Federal Activities Inventory Reform Act*, which directs federal agencies to develop annual inventories of positions that are not inherently governmental.[2] In the Air Force, several data systems identify these positions, including the Headquarters Air Force Manpower Data System (HAF MDS). The HAF MDS identifies these positions through the use of alphabetical codes in the Commercial Industrial Reason data field.[3]

In addition to the competitive sourcing direction provided by the *President's Management Agenda*, the Air Force faces other manpower issues that require it to further explore options for competitively sourcing military positions. For several years now, Air Force manpower books have been out of balance for several reasons. First, the Air Force instituted a 15-percent reduction in headquarters staffs, in which only 7.5 percent was taken. The Air Force needs to pay manpower bills for previous competitive sourcing and privatization initiatives, Program Budget Decision (PBD) 710, and civilian over execution, PBD 023. Also, the Air Force added manpower to the FY03-04 active duty force without taking corresponding offsets. The Air Force Directorate of Maintenance has been asked repeatedly to provide candidate Air Force specialty codes (AFSC), units, and manpower authorizations for consideration for possible conversion to best source (civil service or contract) to support other Air Staff initiatives such as Agile Combat Support for Core Competencies and the Long-Haul and Human Capital Task Forces.[4]

During the Air Force's *hunt* for funded authorizations to turn in to balance the manpower books, career-field functional managers (FAM) identified authorizations that could be turned in to help balance the manpower books. Fortunately, the aircraft, munitions, and missile maintenance FAMs were able to stave off

The overall goal of this effort is to identify aircraft, munitions, and missile maintenance authorizations that do not meet the definition of core as defined by the sponsor.

manpower authorization reductions in the career fields they managed. Since most maintenance manpower requirements are determined by the Logistics Composite Model (LCOM), a resource queuing and simulation tool that models a multitude of different weapon systems and various wartime scenarios they perform, maintenance FAMs could clearly communicate the impact of maintenance manpower authorization reductions on the capability of maintenance to support operational requirements. As a result, maintenance FAMs prevented authorization turn ins from occurring by demonstrating clear impact to operational mission requirements; whereas, other nonmaintenance FAMs could not. Realizing they could rely only on LCOM to prevent authorization reductions for only so long, the Air Force Directorate of Maintenance initiated an Air Force-wide maintenance reengineering effort. This effort is not only examining military positions that can be competitively sourced but also reviewing various maintenance processes for reengineering opportunities that result in efficiencies that reduce manpower requirements and still provide a level of maintenance capability that allows operational requirements to be met.[5]

Problem Statement

The Air Force Directorate of Maintenance repeatedly has been called on to provide candidate AFSCs, units, and manpower authorizations for consideration for possible conversion to the best source to support other Air Staff initiatives, such as Agile Combat Support for core competencies and the Long-Haul and Human Capital Task Forces. Additionally, numerous unfunded aircraft, munitions and missile maintenance requirements could be satisfied from manpower authorization conversions.

Objectives

Perform a comprehensive review of all active duty aircraft, munitions, and missile maintenance authorizations and identify any noncore authorizations (2Axxx, 2Wxxx, 2Rxxx, 2Mxxx, 21Ax, 21Bx, and 21Mx) that do not directly support the warfighter. Core, as defined by Headquarters Air Force Installations and Logistics Maintenance Directorate, is any authorization that meets one of the following criteria: (1) deploys with forces, (2) required by law, (3) training or experience that contributes to or enhances Air Force culture and ethos, or (4) difficult for competitors to imitate.

Overview of Methodology

The overall goal of this effort is to identify aircraft, munitions, and missile maintenance authorizations that do not meet the definition of core as defined by the sponsor. Several approaches could have been used to identify core positions. For example, the coding in the HAF MDS database could be assumed to be accurate, the study could have relied on those codes to perform the analysis, or a position-by-position review of the data could have been conducted. However, after some investigation, the analysis revealed numerous inconsistencies in the data, requiring the use of a different methodology. For this study, the primary methodology relies on a series of data filters that, when applied to the HAF MDS data, identifies authorizations not meeting the sponsor's definition of core.

Each filter is constructed for each of the criteria used by the sponsor to define core authorizations. As the manpower authorization data pass through a filter, the filter separates out data meeting the criteria for that respective filter, allowing the remaining data to pass through to the next filter. After passing data through the entire series of filters, the data that remain represent the noncore authorizations. The deploys-with-forces filter was the first filter in the series followed by the culture and ethos; required-by-law; and finally, the difficult-for-competitors-to-imitate filter.

As the study progressed, it became evident that the deployment criteria provided by the sponsor, deploys-with-forces, were very broad and might not account for the differences, from a macrolevel perspective, unit type code (UTC) requirement differences among units or differences at the microlevel, UTC utilization within units, and within AFSCs in those units. Using an altered methodology to identify additional noncore positions, we drilled down into the data and performed an indepth analysis of a specific squadron. This level of analysis could reveal other noncore positions missed by our original methodology.

Although not central to the methodology, two other filtering procedures were applied to the data to identify noncore authorizations. The results of these two procedures will be used to compare the results from our methodology with results brought about by coding schemes used in official Air Force data systems that currently identify noncore positions. The first filtering technique uses the commercial industry reason (RSC) codes recorded in the HAF MDS database. These codes classify authorizations as being either inherently governmental or a commercial activity. The second procedure uses the RSC codes associated with each authorization in the Inherently Governmental/Commercial Activity (IGCA) database. Even though the IGCA RSC coding schema is the same as the one used in the HAF MDS database, interviews with subject-matter experts indicated the application of the IGCA RSC codes is more accurate. A detailed explanation of these analyses takes place later in the report.

Data

The study required large amounts of manpower and deployment data from a variety of sources. With this data, we could assess each aircraft, munitions, and missile maintenance authorization against the sponsor's criteria, allowing us to identify core and noncore authorizations. To perform the analysis, the team retrieved various types of data from the HAF MDS, Air and Space Expeditionary

Force (AEF) Center Library, Manpower Force Packaging System (MANFOR), and the IGCA database.

Data Preparation

Before beginning the formal data-filtering process, we had to prepare the HAF MDS data (retrieved 18 July 2003) for analysis. Preparation of the data is necessary for several reasons. First, we needed to ensure it only contained active duty military authorization data associated with the AFSCs previously listed. Also, since the data include both current and future years' information, we needed to identify authorizations that were being discontinued in the future. For example, an authorization on the books for fiscal years 2003, 2004, and 2005 but eliminated in 2006, 2007, and 2008 would be identified specifically and included in the final analysis. We included these positions in the analysis so the sponsor would have visibility. Additionally, we identified positions coming on the books in the analysis. Our final data preparation step was assessing the data for conflicts such as associating an officer grade with an enlisted AFSC (or vice versa). Preparation for the other databases was not as extensive. We only used the AEF Library (18 July 2003), MANFOR (20 July 2003), and IGCA (21 July 2003) databases for reference, which negated the need to prepare the data. Overall, our preparation ensured the data were ready for analysis.

Deploys-with-Forces Methodology

To assess whether or not an authorization met the deploys-with-forces criteria, we needed to define the criteria. The definition used in the study is very basic and similar in nature to the definition used in A-76 studies. According to the *DoD Inventory of Commercial and Inherently Governmental Activities Guide to Inventory Submission*, positions having a requirement for personnel to be trained and ready to perform in a combat environment or in an uncontrolled situation where military command, control, and discipline are required and use of DoD civilians or contract support constitutes an inappropriate or unacceptable risk are assigned a commercial industry reason (RSC) code of A. We identified other combat support positions by RSC codes such as B (performs combat support or combat service support functions) and D (dual-tasked for military wartime assignments).[6] When responding to crisis situations, the manpower authorizations (actually the personnel filling them) that meet the aforementioned criteria are subject to forward movement and, therefore, meet the definition of the deploys-with-forces criteria. For forces (most) permanently operating at forward locations such as Korea, our study classified them as also meeting the deploys-with-forces criteria.

Rather than relying only on the HAF MDS RSC codes as the basis for identifying positions meeting the deploys-with-forces criteria, we used the codes listed in the UTC data field. These codes allowed us to identify whether or not a position was subject to fulfilling a deployment requirement. We decided to treat authorizations listed in the HAF MDS and assigned a UTC as meeting the deploys-with-forces criteria.

Required by Law Methodology

The required-by-law requirements fall into two main categories, those required by law or Executive order and those required by treaties or international agreements. However, we did not consider the second category because it did not pertain to our required-by-law methodology since it applies primarily to foreign nationals and not military members. The first category includes activities restricted from private sector performance by a law or Executive order. Examples include:[7]

- Manpower positions used at depot-level maintenance and repair functions required by the 50/50 rule in Section 2466 of Title 10, United States Code;
- Manpower coded for a core logistics capability required by Section 2464 of Title 10, United States Code; and
- Manpower positions for personal services covered by Part 37 of the *Federal Acquisition Regulation.*

In our analysis, the process of identifying military, required-by-law authorizations in the HAF MDS was relatively straightforward. In the HAF MDS, one of the codes used in the commercial industry reason (RSC) data field (L) specifically identifies required-by-law positions.[8] The owning commands, identified in the command abbreviation (CMD) data field, annually identify and validate these L-coded positions.[9] After much research, the team could find no other source of information identifying whether or not a position was required by law. So in the analysis, it was assumed the use of the L code in the RSC data field was appropriate and identified each of the required-by-law authorizations in the data.

Air Force Culture and Ethos Methodology

Because of the subjective nature of this area, the team had trouble defining Air Force culture and ethos in this study. *The American Heritage Dictionary* defines culture as the "customary beliefs, social norms, and material traits of a religious, racial, or social group." It defines ethos as the "fundamental values associated with a specific culture." After reviewing the literature and discussing how Air Force culture and ethos relate to Air Force manpower, we defined Air Force culture and ethos authorizations as those manpower positions that require contact with active duty members to introduce and reinforce Air Force esprit de corps, service to the mission, customs, and courtesies. For the AFSCs in this study, we believed most of these types of authorizations resided in formal training organizations where instructor and student relationships exist.

In the AFSCs examined, authorizations associated with instructor and student relationships belong to formal training organizations such as technical training schools or field training detachments. We identified these authorizations by the use of a T code in the AFSC prefix

data field in the HAF MDS. Authorizations with a T code indicate the authorization is for a formal training instructor position. However, on closer examination of these authorizations, their associated duties, and the populations they target for training, we decided to include only T-coded positions associated with formal technical training at a technical training center, excluding field training instructor authorizations. Since one of the responsibilities of the members who occupy these technical training positions is to continue developing and reinforcing the Air Force culture and ethos instilled in these new members at basic training, we decided the purpose of these positions best reflects the definitions culture and ethos used for this study. The focus of field training instructors is solely technical, and the target population is varied. Therefore, we classified T-coded field training instructor positions as not reflecting the definitions of culture and ethos associated with the sponsor's criteria.

The team also identified one other aspect of Air Force culture and ethos to assess against each of the authorizations examined. The Air Force uses these authorizations, in part, to project and reinforce, both internally and externally, its culture and ethos. Authorizations associated with this aspect of culture ethos are authorizations used to support the Air Force Demonstration Squadron, the Thunderbirds, and authorizations assigned to the 89th Airlift Wing's Presidential Logistics Squadron supporting *Air Force One.* By identifying the respective Personnel Accounting Symbol (PAS) code for each of these units, we will be able to identify all the authorizations designated to support these two units and can classify them as meeting the Air Force culture and ethos criteria.

Difficult for Competitors to Imitate Methodology

According to the literature, the private sector can perform duties associated with most Air Force functional areas. In aircraft, munitions, and missile maintenance, most military technical and nontechnical services are able to be duplicated in the private sector; however, the availability of those services may be limited by a wide variety of factors such as geographic location, expected profitability, and availability of capable service providers in the market (technical and nontechnical) area. Arguably, some functions, like low-observable materials and nuclear munitions maintenance, are difficult (but not impossible) to duplicate; whereas, other functions, such as maintenance analysis and jet engine repair, are not. In the end, the question is not so much whether or not the tasks associated with a position are difficult for competitors to imitate in terms of whether or not a service can be provided (in most situations it can) but rather a question of whether the service considered for competition is military-essential.

In our analysis, the process of identifying difficult-for-competitors-to-imitate authorizations is relatively straightforward. We used the existing RSC coding schema in the HAF MDS to identify authorizations easily duplicated by the private sector. These alphabetical codes designate manpower positions as inherently governmental, exempt from private sector performance or subject to review for divestiture or private sector performance (Table 6). The Air Force also uses these codes to designate manpower as civilian essential or military essential. Authorizations coded with an RSC code of P, R, W, or X are positions identified and validated as being eligible for private sector competition. By using the filtering tools in Microsoft Access, we will remove all the positions coded P, R, W, and X, leaving only the positions meeting the difficult-for-competitors-to-imitate criteria.

Analysis

Data Preparation

The first step taken to prepare the data for analysis was to ensure the data set (90,496 total authorizations) did not contain any civilian, Air National Guard (ANG), or Air Force Reserve Command (AFRC) authorizations. As we reviewed the data, we found that they did not contain any civilian authorizations but did include ANG and AFRC authorizations. To exclude these authorizations from our analysis, we examined the CMD data field to determine which command each authorization belonged to. The Air Force uses this field to identify which major command (MAJCOM), field-operating agency, direct reporting unit, or other organization an authorization is assigned. We excluded all authorizations coded with either an *ANG* or *AFR* in the CMD field from the data to be analyzed. After eliminating the ANG and AFRC authorizations from the data, the team was left with 88,471 authorizations to review.

After assessing the data for conflicts and not finding any, we identified authorizations that were either being added or deleted from the HAF MDS between the time of the study and the fourth quarter of FY08. Our evaluation of the data of authorizations revealed 11,363 authorizations undergoing some form of change. In some cases, authorizations were being deleted between FY03 and FY08; in other instances, authorizations were being added. We also found occasions in which authorizations were added after FY03 but deleted before FY08. Regardless of what was happening to these authorizations, we ensured that they were identified and evaluated. Tables 1 and 2 list the quantities and classify the type of change occurring to these authorizations and the number of authorizations to review for each AFSC.

Deploys with Forces

As previously stated, our initial plan was to classify authorizations in the HAF MDS with UTCs as meeting the deploys-with-forces criteria; however, when we cross-referenced the UTCs loaded in the HAF MDS with those listed in the AEF Library, they did not match. This being

Type of Change	Number of Authorizations
Deletions	6,637
Add Then Delete	504
Delete-Add-Delete	20
Add	4,202
Total	**11,363**

Table 1. Authorizations Undergoing Change

AFSC	Number of Authorizations to Review
2Axxx	66,015
2Wxxx	16,306
2Mxxx	2,346
2Rxxx	1,818
21Ax*	810
21Mx*	211
21Bx*	965
Total	**88,471**
*Officer AFSC	

Table 2. Total Authorizations to Review by AFSC

the case, we altered our original methodology and used both the MANFOR and the AEF Library's UTC data as the study's source of official UTC information. Although tedious, we were able to use these data to identify positions in the HAF MDS that met deploys-with-forces criteria.

In our revised methodology, we sorted the MANFOR data using the AFSC data field, which allowed us to identify all the UTCs, both maintenance (Hxxxx or 3xxxx) and nonmaintenance, requiring some sort of aircraft, munitions, and missile maintenance capability. With this list of UTCs, we cross-referenced the information with AEF Library data, allowing us to identify every organization listed in the AEF Library with these UTC requirements. For units with maintenance or maintenance and nonmaintenance UTCs listed in the AEF Library, we located each one of them in the HAF MDS and coded all their authorizations as meeting the deploys-with-forces criteria. We coded the authorizations in this manner for several reasons. First, the Air Force is in the process of implementing a new modular and scalable UTC structure that will significantly change the way it deploys forces; however, the new UTC structure has not been formally integrated into the AEF library and other deployment processes. Furthermore, UTC reengineering guidance, put forth by the Headquarters Air Force Installations and Logistics Maintenance Directorate in 2001, directs each MAJCOM to:

> …conduct a thorough top-down review and rightsizing effort to create maintenance UTCs that are standardized across the MAJCOM and Air Force and that MAJCOMs will utilize the Logistics Composite Model as the manpower baseline to develop standard modular/scalable UTCs.[10]

The net result of this and other guidance is that each manpower authorization earned from LCOM standards will have a UTC requirement associated with it. This will result in more positions having UTCs assigned against them, increasing the overall availability of UTC capabilities.[11] Even though the guidance was put forth in 2001 and many MAJCOMs have complied with it, the AEF Library does not reflect the UTC changes. The team believed, by using the study's current deploys-with-forces methodology, the analysis prevents positions classified as not meeting the deploys-with-forces criteria when, in fact, the positions will meet the criteria once the UTC data in the AEF Library reflect the MAJCOM's implementation of Air Staff guidance.

During our analysis, we identified several organizations not listed in either the MANFOR or AEF Library databases. Because these units were not listed in either database, we were unable to identify UTCs associated with their manpower positions. For these units, we made a determination as to whether or not each was an outside the continental United States (OCONUS) or continental United States (CONUS) unit. If the authorizations were assigned to an OCONUS unit supporting a permanently assigned weapon system (that is, F-16 aircraft at Kunsan AB, Republic of Korea), we classified the unit as forward deployed. Units classified in this manner were considered to have met the deploys-with-forces criteria. However, if a unit was identified as being at an OCONUS location and not supporting a permanently assigned weapon system (that is, en route maintenance at Moron AB, Spain), it was considered as not having a deployment requirement, and its positions did not meet the deploys-with-forces criteria used in the study. Units identified as CONUS units and not listed in either the MANFOR or AEF Library databases were considered as not having a deployment requirement and, therefore, did not meet the study's deploys-with-forces criteria.

For the organizations that only had nonmaintenance UTC requirements, we identified the specific maintenance AFSC capability the UTC required and coded all those AFSC positions within the organization as meeting the deploys-with-forces criteria. After these positions were coded as meeting the criteria, all other maintenance positions assigned to this squadron were coded as not meeting the deploys-with-forces criteria since there were no UTCs associated with those positions. Figure 1 depicts the deploys-with-forces methodology.

Applying this methodology to the 88,471 authorizations in the HAF MDS database allowed us to classify 73,843 as *core* positions and 14,628 as *noncore*.

Required by Law

As previously stated, required-by-law authorizations are identified in the HAF MDS by the use of an L code in the RSC data field. To identify the required-by-law positions,

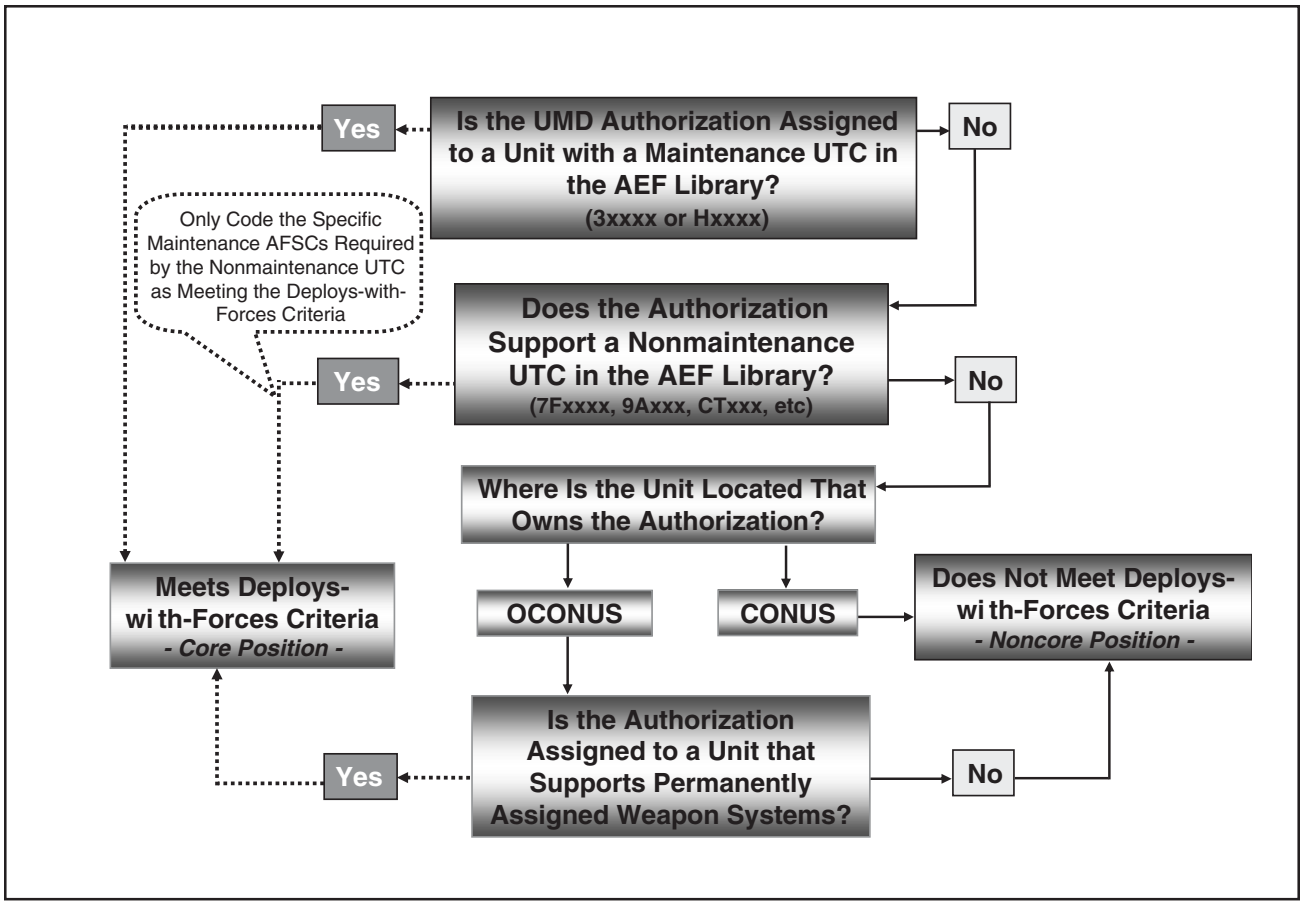


Figure 1. Deploys-with-Forces Methodology

ACTIVE DUTY AUTHORIZATIONS BY RSC CODE			
DoD Criteria Code (RSC)	Manpower Mix Criteria	Resource Limitations	Authorizations
A	Military Operations	Military Only	74,114
B	Military Support Elements in Operating Forces	Military Only	2,704
C	Civilian Support Elements in Operating Forces	Civilian Only	3,076
D	Exemptions for Military and Civilian Wartime Designations (Dual Status)	Military and Civilian	20
E	Civilian Authority, Direction, and Control	Civilian Only	2,121
F	Military-Unique Knowledge and Skills	Military Only	1,530
G	Exemptions for Esprit de Corps and Military Support	Military and Civilian	2
H	Continuity of Infrastructure Operations	Civilian Only	14
I	Military Augmentation of the Infrastructure During War	Military Only	5
J	Civilian and Military Rotation	Military or Civilian	218
K	Civilian and Military Career Progression	Military or Civilian	0
L	**Restricted by Law, Executive Order, Treaty, or International Agreement**	**Military or Civilian**	**2,057**
M	Restricted by DoD Management Decision	Military or Civilian	4
N	Codes from Old Coding Criteria		15
O	Codes from Old Coding Criteria		26
P	Pending Restructuring Decision	Military or Civilian	1
R	Subject to Review	Military or Civilian	778
W	Nonpackageable Commercial Activity	Military or Civilian	2
X	Alternatives to A-76	Military or Civilian	0
	Positions Not Coded		1,784
		Total Authorizations	**88,471**

Table 3. Required-By-Law Analysis Results

we sorted the data by the RSC data field. This grouped all the L-coded authorizations within the database, allowing us to identify easily each required-by-law authorization. Our analysis of the data revealed 2,057 of the 88,471 authorizations met the required-by-law criteria used in the study. The results of the required-by-law analysis are shown in Table 3.

Air Force Culture and Ethos

Using the culture and ethos methodology previously described, we identified every authorization having a T code in the ASP data field. Once we identified these authorizations, we evaluated each of them further by examining the Functional Account Title (FAA) data field to identify the specific functional area in which an authorization has been assigned. In the FAA field, T-coded authorizations assigned to the various technical training centers list a technical training course code, such as *J3ABR2A635*. The ninth digit in each course code, a 3 in this instance, identifies the trainee skill-level (3-level) that the course is designed to support for each respective AFSC (the last five digits identify the course's target enlisted AFSC; for officers, it is the last four digits). Using this approach, we were able to identify 3-level (or lower) technical training instructor positions. We also cross-referenced the identified positions with the installation location name, organization number, organization title, organization type, and the program element code title data fields to ensure the authorization's location (that is, Sheppard AFB), organization (that is, 363[d] Technical Training Squadron), and funding program element (that is, general skills training–initial skills [active duty driven]) were associated with formal technical training. Authorizations meeting these criteria were identified as Air Force culture and ethos positions in the analysis.

Next, we identified each authorization in the HAF MDS with either a PAS code of FDF3, Presidential Logistics Squadron, or FD07, USAF Aerial Demonstration Squadron. These authorizations also met the Air Force culture and ethos criteria defined earlier in the report. Figure 2 depicts the study's ethos and culture methodology.

Of the 88,471 maintenance authorizations reviewed, 1,033 were identified as formal technical training instructors who met our Air Force culture and ethos-filtering criteria defined in the methodology. Additionally, through the filtering process, we identified 97 authorizations as Air Force Aerial Demonstration Squadron positions while 78 were linked to the Presidential Logistics Squadron. All together, 1,208 authorizations were identified as positions meeting the Air Force culture and ethos criteria.

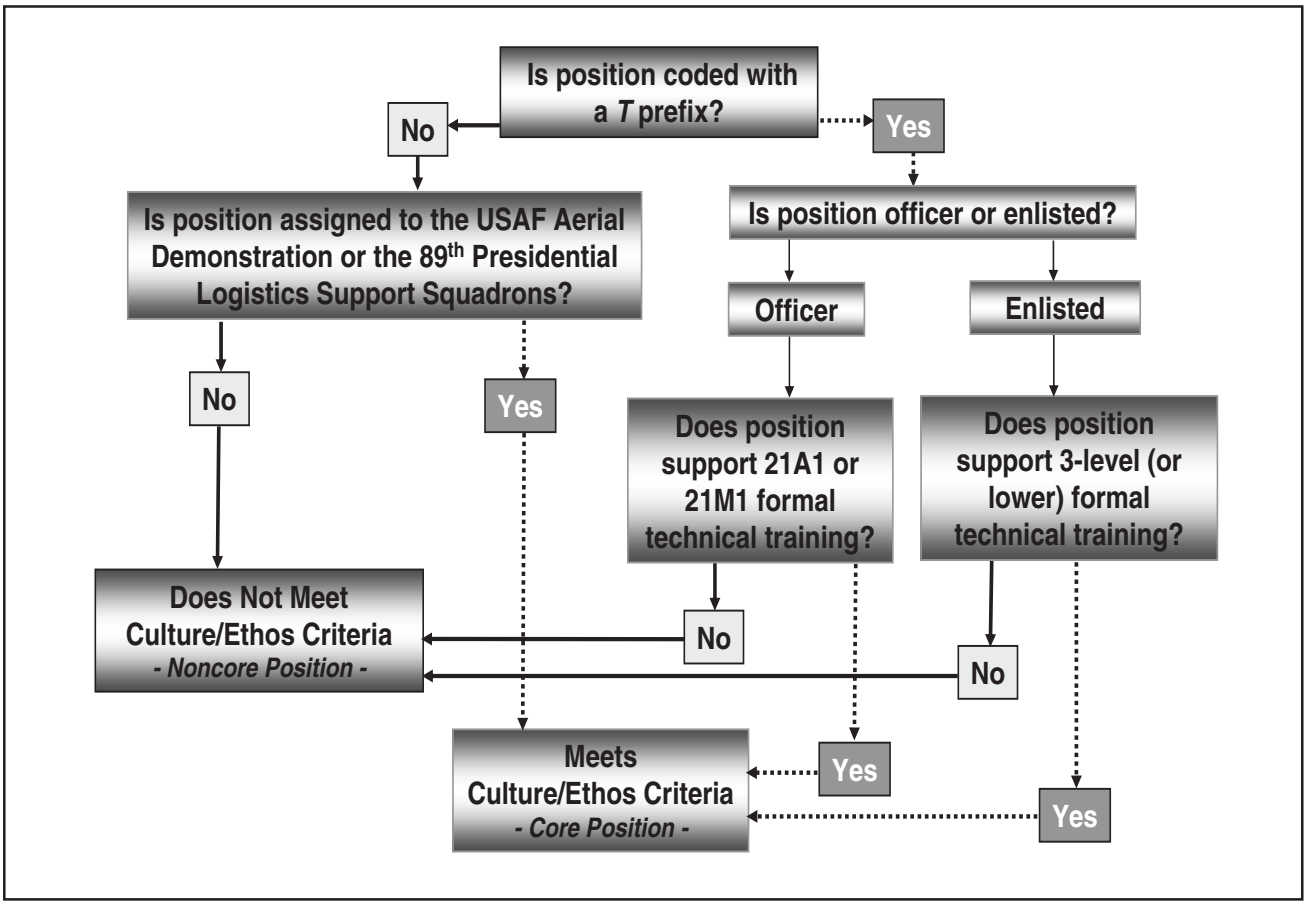


Figure 2. Air Force Ethos and Culture Methodology

Difficult for Competitors to Imitate

As previously stated, we identified authorizations coded with P, R, W, and X RSC codes. We sorted the HAF MDS data by the RSC data field and summed up the total number of positions assigned one of these four codes. This allowed us to identify every position residing in the data that had been identified as a candidate for outsourcing (Table 4).

Because of the subjectivity, inconsistencies between the databases and level of analysis required to ascertain whether or not each position was difficult-for-contractors-to-imitate (military essentiality, level of risk, and so forth), we believed the functional managers in each respective MAJCOM were in a better position to perform this assessment. Consequently, we decided just to report the results of the difficult-for-competitors-to-imitate-filtering effort and not include them in the team's final filtering results. Using the RSC coding in the HAF MDS database as our criteria, we identified 87,690 positions as meeting the difficult-for-competitors-to-imitate criteria and 781 that did not.

Final Filtering Results

After we determined each individual filter was functioning correctly, we passed our HAF MDS data through the entire series of filters. As the authorization data passed through each filter, the authorizations meeting the criteria established for each filter data were caught while those not meeting the criteria passed through all the filters. Positions caught by the filters were identified as core authorizations; whereas, those that passed completely through the filters were identified as noncore. Then, the noncore authorizations were assessed to determine if our data preparation efforts had identified any of them as authorizations that were to be deleted between FY03 and the fourth quarter of FY08.

Of the 88,471 authorizations assessed, 12,020 did not meet the criteria used by the filters in our analysis. Of those authorizations, we identified 1,669 as authorizations to be deleted from books by the fourth quarter of FY08. Once that was completed, we sorted the remaining noncore authorizations, 10,351, by MAJCOM. Tables 5 and 6 illustrate the results of the final filtering effort.

Conclusions

- Using the methodology outlined in this study, we were able to identify 12,020 positions as noncore positions. Between FY03 and the end of FY08, 1,669 of these positions will be deleted, leaving 10,351 noncore positions on the books at the beginning of FY09.
- Definitions of what constitutes core already exist; however, in many cases, they are varied and ambiguous.
- Even with written guidance, the interpretation of core within the aircraft, munitions, and missile maintenance functional areas seems to vary among the MAJCOMs.
- Since many noncore positions are likely to become candidates for competitive sourcing, one needs also to assess the risks associated with outsourcing noncor*e* positions.

ACTIVE DUTY AUTHORIZATIONS BY RSC CODE

DoD Criteria Code (RSC)	Manpower Mix Criteria	Resource Limitations	Authorizations
A	Military Operations	Military Only	74,114
B	Military Support Elements in Operating Forces	Military Only	2,704
C	Civilian Support Elements in Operating Forces	Civilian Only	3,076
D	Exemptions for Military and Civilian Wartime Designations (Dual Status)	Military and Civilian	20
E	Civilian Authority, Direction, and Control	Civilian Only	2,121
F	Military-Unique Knowledge and Skills	Military Only	1,530
G	Exemptions for Esprit de Corps and Military Support	Military and Civilian	2
H	Continuity of Infrastructure Operations	Civilian Only	14
I	Military Augmentation of the Infrastructure During War	Military Only	5
J	Civilian and Military Rotation	Military or Civilian	218
K	Civilian and Military Career Progression	Military or Civilian	0
L	Restricted by Law, Executive Order, Treaty, or International Agreement	Military or Civilian	2,057
M	Restricted by DoD Management Decision	Military or Civilian	4
N	Codes from Old Coding Criteria		15
O	Codes from Old Coding Criteria		26
P	Pending Restructuring Decision	Military or Civilian	1
R	Subject to Review	Military or Civilian	778
W	Nonpackageable Commercial Activity	Military or Civilian	2
X	Alternatives to A-76	Military or Civilian	0
	Positions Not Coded		1,784
		Total Authorizations	**88,471**

Table 4. IGCA Database: Difficult for Competitors to Imitate

Core Filtering Process			
Criteria	**Number of Positions Evaluated**	**Number of Positions Meeting Criteria**	**Number of Positions Remaining to be Evaluated**
Total Authorizations Evaluated	**88,471**		
Deploys with Forces Filter	88,471	73,843	14,628
Required by Law Filter	14,628	1,400	13,228
Culture/Ethos Filter	13,228	1,208	12,020
Data Preparation Results^	12,020	1,669	10,351
Total Suspect Authorizations			**10,351**
Difficult for Competitors to Imitate*	88,471	87,690	781

^Positions that passed through all filters but were Identified as being slated for deletion by the 4th quarter of FY08
*Reviewed and evaluated but not included in the filtering series or in final number of suspect authorizations

Table 5. Final Core Filtering Process

- Some data contained within the HAF MDS and IGCA databases are incorrect UTC and questionable (commercial activity identifier [RSC]), which could result in the misclassification of positions as being core or noncore. RSC codes for each authorization should be consistent between the HAF MDS and IGCA databases.

Notes

1. US General Accounting Office, DoD Faces Challenges Implementing Its Core Competency Approach and A-76 Competitions (GAO-03-818). Washington, DC, Jul 03.
2. *Ibid*.
3. Author's interview with Vince Gasaway, Deputy Director of the Air Force Competitive Sourcing Office, Jul 03.
4. John Vrba, AF/DPMS, Balance the Manpower Books, Human Capital Task Force, Core Competencies Briefing, Dec 02.
5. Author's interview with CMSgt Matthew McMahan, Maintenance Functional Manager, AF/ILMM, Dec 02.
6. DoD Inventory of Commercial and Inherently Governmental Activities Guide to Inventory Submission, Nov 02.
7. *Ibid*.
8. *Ibid*.
9. Capt Marka Dethier and Ginger Miseta; Manpower Analysts (AMC/XPMPR), e-mail: RSC Coding Process, Jul 02.
10. Joint HQ USAF/ILM/ILX/XOX message, Maintenance UTC Reengineering, Posturing, Aerospace Expeditionary Force (AEF) Alignment and Sourcing Guidance, 2001.
11. Author's interview with CMSgt Matthew McMahan, Maintenance Functional Manager (AF/ILMM), Jul 03.

Core Filtering Process		
Authorization Evaluations*		
MAJCOM	**Number of Positions Evaluated**	**Number of Positions Found Suspect**
ACC	34,886	1,823
AETC	9,072	3,892
AMC	16,704	1,068
USAFE	7,392	481
PACAF	10,589	260
SPACE	2,120	1,560
AFMC	3,670	814
AFSOC	3,406	90
EUR	84	7
FOA/DRU	548	356
Total	**88,471**	**10,351**

*Excludes authorizations slated for deletion

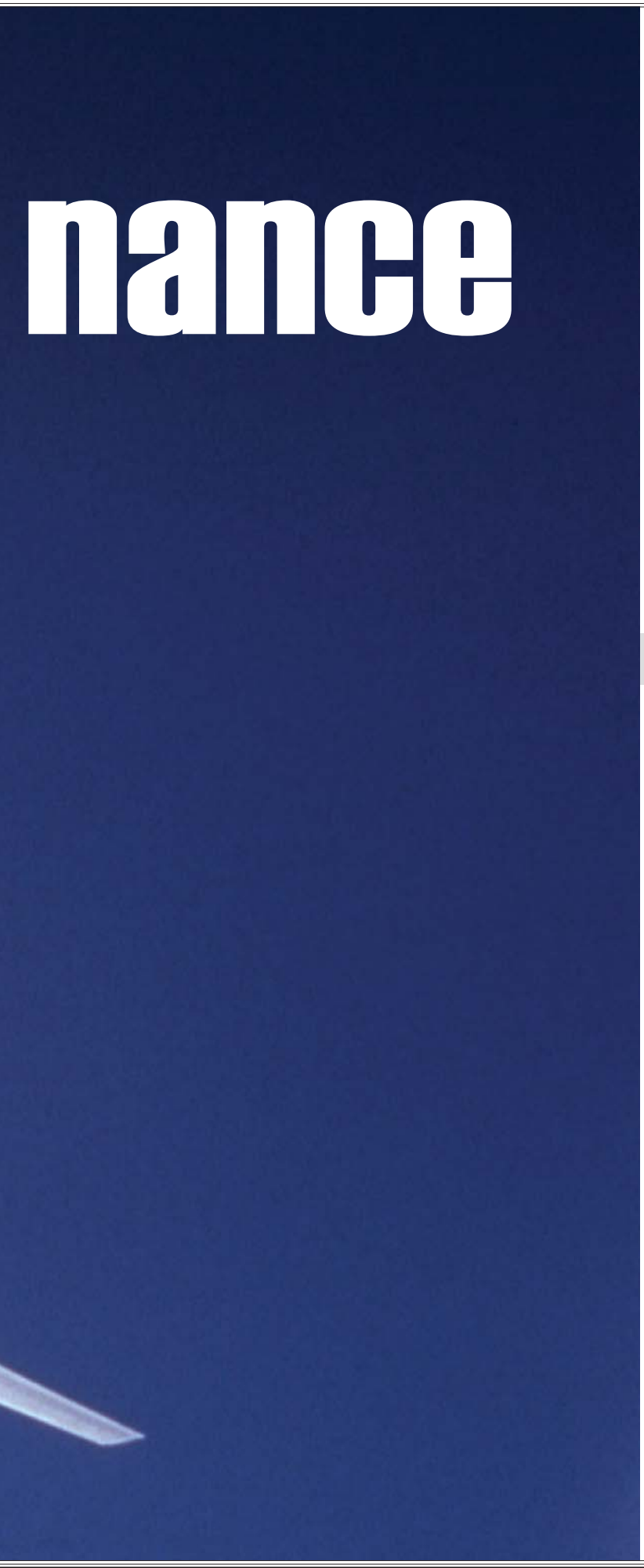
Table 6. Total Suspect Positions by MAJCOM

AFLMA
online http://www.aflma.hq.af.mil/

Issues, Concerns , and Analyses

UAV Mainte

First Lieutenant Brian R. Detwiler
Captain Timothy A. Smith



nance

The root of the problem was a necessary swift determination of the current UAV maintenance crew structure, driven primarily by the system's rapid development and deployment through the Advanced Concept Technology Demonstration process, rather than an encompassing analysis of maintenance specialty skills, career-field manning, and future force structure considerations.

One look at the 2002 unmanned aerial vehicle (UAV) roadmap, released by the Office of the Secretary of Defense, and it is immediately obvious the expansive role UAVs will play in national defense planning for years to come. The elaborate 195-page report details operational UAV systems, projected UAV force structures, and various UAV systems currently in development, looking as far out as 2027. On par, the UAV role continues to expand for the Air Force, with the Predator flying operations in Afghanistan and Iraq, the Global Hawk recently taking part in joint military exercises in Europe, and the unmanned combat air vehicle (UCAV) continuing its milestone-dotted road to an operational status. However, while the publicity of UAV operations seems to be centered on their impressive cache of high-tech spying equipment, seemingly endless flight durations, and no-risk pilot control features, there is another piece that is lingering in the shadows: ambiguous maintenance support.

AFLMA was tasked by the Headquarters Air Force Installations and Logistics Directorate of Maintenance in September to investigate this important, yet seemingly overlooked, piece of the

UAV puzzle. It seems as though the root of the problem was a necessary swift determination of the current UAV maintenance crew structure, driven primarily by the system's rapid development and deployment through the Advanced Concept Technology Demonstration process, rather than an encompassing analysis of maintenance specialty skills, career-field manning, and future force structure considerations. As a result, our study will investigate whether the maintainers established in this manner are those best suited to maintain current and future UAVs or whether there exist other configurations that potentially could increase manpower potency and, as an added benefit, reduce the associated maintenance unit type code (UTC) footprint.

One possible remedy to the problems may lie in an unlikely area. As designated by Air Force Instruction 36-2108 dated October 2001, missile and space system maintainers (Air Force specialty codes [AFSC] 2M0X1 and 2M0X2) are included in UAV maintenance structures. However, quick glances into the sole operational Air Force UAV system, the MQ-1 Predator, and its soon-to-follow counterpart, the MQ-9 Predator B, prove that this designation exists only on paper and not in practice. While the current Predator UTCs include a host of traditional aircraft maintenance AFSCs, such as aircraft crew chiefs and electricians, there is not a single manpower requirement or authorization for missile maintainers. In light of this apparent contradiction, our team will look into its origins and examine the maintenance manning alternatives it inherently carries with it.

Research and Analysis Topics

Our study team has immersed itself in research, which we feel is necessary to gain insight into a host of topics that relate to UAVs and Air Force maintenance fields. At the forefront of these topics are maintenance skill sets associated with various AFSCs and task requirements that correspond to those UAVs included in the study. These two header topics constitute the heart of our study, since each UAV requires a specified number and type of maintenance tasks, and each AFSC has a metaphorical toolkit from which to choose to accomplish these tasks. In short, only those with certain AFSCs are capable of completing certain tasks; therefore, we must match the abilities of maintainers to the needs of UAVs in the most feasible and efficient way possible.

Once this skill set piece has produced analysis alternatives, in the form of various maintenance crew configurations, outside factors, which may not relate directly to the completion of maintenance tasks, must be taken into account. Among these outside or secondary considerations are AFSC manning breakouts and details (for example, total force size and skill-level mix), AFSC career paths (for example, progression opportunities through assignments and interchangeability among different systems), and future UAV force structure numbers (for example, number of squadrons and systems expected and number of developing systems becoming operational). These topics will allow a more thorough examination of the proposed alternatives, assessing the wider impact they may have on aircraft and missile maintenance fields and the Air Force as a whole. For instance, if a maintenance crew alternative matches UAV task requirements with desired manpower utilization rates and minimal bodies per UTC but creates a significant strain on the available manpower in a specific AFSC used in the crew, this negative impact will be assessed and detailed as part of the alternative.

Issues

This study carries with it an abundance of issues, all of which have the potential to significantly shift the direction of the study. As a brief introduction to the scope of these issues, we will introduce two that our team has wrestled with thus far. Specifically, the varying complexity of UAV systems and the relative difficulty of studying new, inexperienced Air Force systems have brought up an assortment of questions and, in turn, shed some light on our emerging analysis plan.

Originally, the Headquarters Air Force Installations and Logistics Directorate of Maintenance study request led us to assume that those maintenance alternatives decided upon would be universally applied to all UAVs under consideration in the study. Explicitly, if we determined that a certain maintenance crew was best-suited to maintain a particular UAV system, the analysis would be such that all UAV systems in the study would derive a proportionally equivalent benefit from the same crew. However, following visits in which study team members were able to view and explore some of the UAVs involved in our analysis, it was universally decided that each of the systems would have to be considered a distinct, independent entity. This fact was made abundantly clear by the differences in system complexity and, thus, the differences in expertise that would be necessary to maintain them. For example, as Air Force Chief of Staff General John P. Jumper recently mentioned, the mechanical composition of the Predator is similar to "a little Cessna 152 with a snowmobile engine in the back."[1] On the other hand, the mechanical composition of the UCAV is likened more to that of an F-22. This striking contrast led us to decide that, once finalized, a single analysis plan must be applied independently to each UAV system. The resulting alternatives will be tied solely to the system under consideration and not to other systems related strictly by their designation as UAVs.

A second issue that has arisen in our study is one based on another contradiction: that between the increasing interest in UAV operations and the limited experience and data UAVs bring with them to a study. In particular, the very aspect that makes UAVs such enticing subjects—namely, their relatively new operational concepts—also presents one of the greatest obstacles to the AFLMA study team. There is simply not an abundance of experience,

operational data, or functional expertise from which to draw. The oldest system the study will focus on is the MQ-1 Predator, a system that has been part of the Air Force arsenal since 1997. This hardly makes the MQ-1 a regular or high-visibility topic for those wanting to investigate its operational requirements. To compound the problem, the other two systems on which our study will focus, the RQ-4 Global Hawk and X-45 UCAV, are even *greener* than the Predator. The limited or, in some cases, complete lack of operational experience means that maintenance data and functional expertise is just as hard to come by on these systems. While the MQ-1 has been flying long enough to gather and analyze relatively reliable data on blue-suit maintenance requirements, the other systems offer mostly contractor insight into this subject. Unfortunately, this insight does not always correlate directly into blue-suit requirements and, as such, sound assumptions on these subjects will be vital components of our analysis plan.

Conclusion and Impacts

The impact our team hopes to accomplish is that of shedding light on the maintenance crew constructs for the emerging UAV arsenal. Once all issues and assumptions have been taken into account, our analysis plan should provide Air Force decisionmakers with an objective tool specific to the distinct aspects of the different Air Force UAVs, yet broad enough to assess secondary impacts on maintenance AFSC communities and the Air Force as a whole. This tool, as well as the analysis construct behind it, will provide not only immediate alternatives for the problem at hand but also a template for future analysis of UAV maintenance requirements.

Notes

1. Gen John P. Jumper, Air Force Chief of Staff, "Sharpening the Sword for the Future," speech to the Air Armament Summit V Gala Dinner, Florida, 13 Mar 03.

As some of the injuries done us have become intolerable, we have still been clear that we wished nothing for ourselves that we were not ready to demand for all mankind—fair dealing, justice, the freedom to live, and to be at ease against organized wrong.

—Woodrow Wilson

Clearly, logistics is the hard part of fighting a war.

—Lieutenant General E. T. Cook, USMC

It's the unconquerable soul of man, not the nature of the weapon he uses, that insures victory.

—General George S. Patton Jr, USA

Because of what America is and what America has done, a firmer courage, a higher hope, inspires the heart of all humanity.

—Calvin Coolidge

Logistics is the bridge between the economy of the nation and the tactical operations of its combat forces. Obviously, then, the logistics system must be in harmony, both with the economic system of the nation and with the tactical concepts and environment of the combat forces.

—Admiral Henry E. Eccles, USN

The final dictum of history must be that whatever excellence Lee possessed as a strategist or as a tactician, he was the worst Quartermaster General in history, and that, consequently, his strategy had no foundations, with the result that his tactics never once resulted in an overwhelming and decisive victory.

—Major General J. C. Fuller, USA

There were four objectives for this study: (1) what does CBM+ mean to the Air Force—identify or establish an Air Force CBM+ definition; (2) how do we do CBM+—create or identify an Air Force-specific baseline of CBM+-enabling technologies and concepts; (3) let us know what strides we (the Air Force) have already made toward CBM+—investigate selected legacy and future weapon systems, cataloging existing and future CBM+ initiatives; and (4) provide recommendations for implementing an Air Force CBM+ policy.

A Roadmap for Air Force Processes

Integrating CBM+

Captain Timothy A. Smith

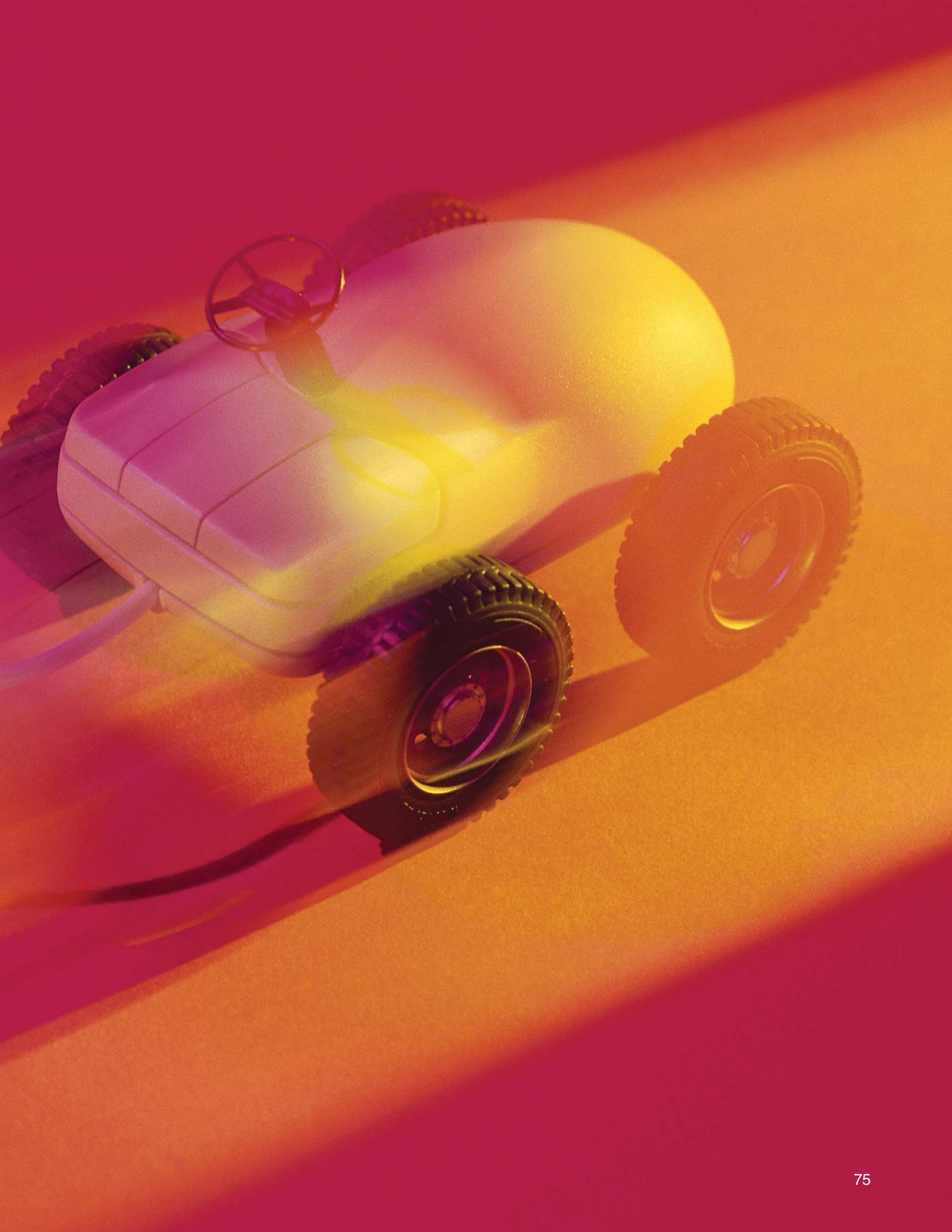
I am sure you are asking yourself, "What exactly is this CBM+ thing?" Well let me give you the laymen's answer. The CBM+ vision is smarter aircraft: aircraft with embedded sensors such as prognostics and diagnostics, providing enhanced system health monitoring, condition-driven maintenance, advanced fault detection and isolation, and life-parameter prediction.

The CBM+ vision is integrated information systems: systems that provide configuration management, asset visibility, as well as trend analysis available to any valid user via the World Wide Web.

The CBM+ vision is electronic portable or point-of-maintenance aids. PMAs will provide common access to aircraft data, interactive training, and parts availability. Interactive technical manuals will provide maintainers instantaneous technical information and diagnostic interpretation capability.

Advanced inspection methods and tools are also a part of the CBM+ vision. Inspection methods within the CBM+ environment ultimately will enhance asset life and reduce maintenance cost.

All these things, working in unison, will improve logistics responsiveness and reduce the logistics footprint and weapon system total ownership costs.



Within most of our legacy systems, these technologies will be stand-alone devices capable only of limited CBM+ application. However, each CBM+ application will enhance the overall weapon-system maintainability. As our CBM+ technology infrastructure grows, these technologies and concepts will interact with each other, perform as a network, and make the CBM+ vision possible for our future weapon systems.

Figure 1 illustrates a conceptual analogy of the interaction of each CBM+ technology.

Problem

Per Department of Defense (DoD) policy, the military services are directed to implement tenets of CBM+ into weapon systems maintenance and logistics support programs where implementation is cost-effective. To accomplish this, existing Air Force policies, processes, procedures, information systems, and logistics concepts must be evaluated and integrated into an Air Force strategy for implementing CBM+ policy.

The Director, Directorate of Innovation and Transformation, Deputy Chief of Staff, Installations and Logistics, responded to this Deputy Under Secretary of Defense for Logistics and Materiel Readiness (DUSD/L&MR) policy by requesting that AFLMA perform a comprehensive study on Air Force CBM+ implementation as a basis for establishing an Air Force policy for CBM+.

There were four objectives for our study: (1) what does CBM+ mean to the Air Force—identify or establish an Air Force CBM+ definition; (2) how do we do CBM+—create or identify an Air Force-specific baseline of CBM+-enabling technologies and concepts; (3) let us know what strides we (the Air Force) have already made toward CBM+—investigate selected legacy and future weapon systems, cataloging existing and future CBM+ initiatives; and (4) provide recommendations for implementing an Air Force CBM+ policy.

Research

Defining CBM+

Before the Air Force can apply the CBM+ concept, we had to fully understand what it was and define it for Air Force use. Our research uncovered numerous definitions for CBM and CBM+ from academia, commercial research agencies, commercial industry, and DoD. We found the DoD definition presented in the DUSD/L&MR policy letter to be sufficient, with minor modification, for Air Force use. We suggested adding wording to the DoD definition

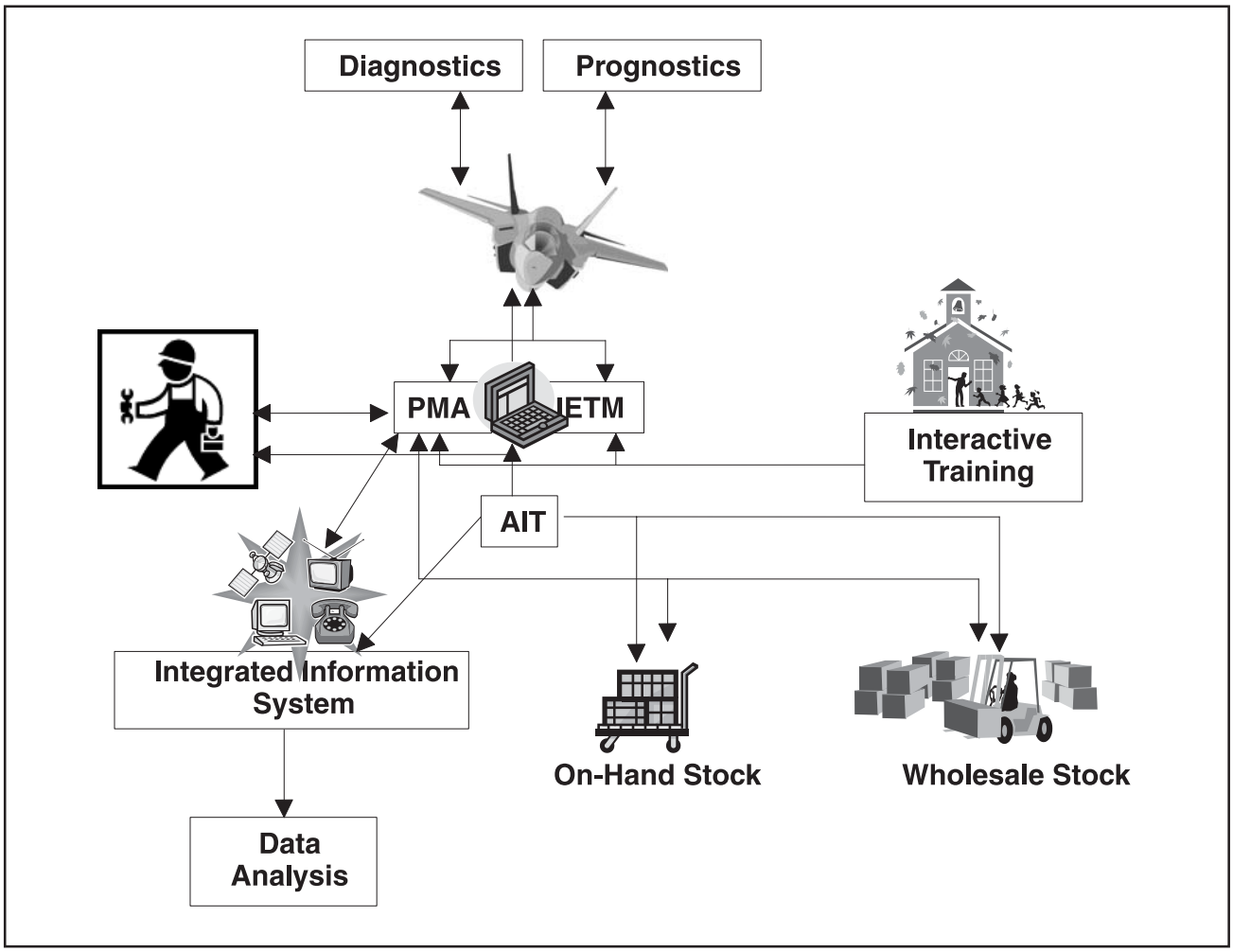


Figure 1. CBM+ Technologies Conceptual Analogy

CBM+ Technologies	Weapon Systems Specific Initiatives			
	B-1	C-17	F-16	F/A-22
Automatic Information Technology		SNT Test	DRILS	
Interactive Electronic Technical Manuals	Class III IETM	Class II IETM	Class III IETM	IMIS
Diagnostics	CITS	AFFIP/MMP	MFL/PFL	IMIS/DTC/MWS
		SEC	EDNA	
Prognostics[1]	Note 1	Note 1	Note 1	Note 1
Data Analysis			DRILS	IMIS
Portable Maintenance Aids		SEC	EDNA	Honeywell Data Trak
Integrated Information System				
Interactive Training				MTS

Table 1. Weapon System Specific CBM+ Initiatives

emphasizing the need for implementation consideration throughout the acquisition life cycle. This emphasis should be reinforced in the appropriate Air Force regulatory guidance. The proposed definition is as follows:

> Condition-based maintenance (CBM) can be defined as a set of maintenance processes and capabilities derived from real-time assessment of weapon-system condition obtained from embedded sensors and/or external tests and measurements using portable equipment. The goal of CBM is to perform maintenance only upon evidence of need.
>
> CBM+ expands on these basic concepts, encompassing other technologies, processes, and procedures that enable improved maintenance and logistics practices. These future and existing technologies, processes, and procedures will be addressed during the capabilities planning, acquisition, sustainment, and disposal of a weapon system.

Establishing an Air Force-Specific Baseline

For the Air Force to apply CBM+, we had to set a baseline to work from. We compared CBM+-enabling technologies and concepts outlined by the Maintenance Technology Senior Steering Group and DUSD/L&MR. We found their listings to be very similar and concluded that these technologies and concepts cover the gamut of current CBM+ processes. We also concluded that these technologies and concepts, with minor revision, are acceptable for use as an Air Force-specific baseline for CBM+.

The proposed technologies and concepts were:

Technologies

- Prognostics
- Diagnostics
- Portable Maintenance Aids
- Interactive Electronic Technical Manuals
- Interactive Training
- Data Analysis
- Integrated Information Systems
- Automatic Identification Technology

Concepts

- Reliability Centered Maintenance
- Joint Total Asset Visibility

After a thorough review, we concluded, although the Air Force implements, to varying degrees, many of the technologies and concepts that constitute the proposed Air Force CBM+ baseline, it lacks the formal guidance needed to achieve synergies in CBM+ implementation.

Cataloging Existing and Future CBM+ Initiatives

Our team chose three fielded weapon systems (B-1, C-17, and F-16) and one future weapon system (F/A-22) for cataloging existing and future CBM+ initiatives. Because of the allotted timeframe of the study, it was not possible to catalog all CBM+-like initiatives within the entire Air Force. We only provided a snapshot of the weapon systems examined during the study.

During our research, we cataloged CBM+ initiatives within each of the eight identified technologies and two concepts. We then broke each effort into one of three categories. First, we identified weapon system-specific initiatives (Table 1). The B-1 Bomber Central Integrated Test System (CITS) is an example of a weapon system-specific initiative. Second, we identified those technology initiatives not common to any specific weapon system (Table 2). One example of this is the Air Force Common Viewer (AFCV). The AFCV is a Class 3 IETM used to view technical orders for any weapon system and accessible to

CBM+ Technologies	Nonweapon System Specific Initiatives				
Automatic Information Technology	SNT	POMX			
Interactive Electronic Technical Manuals	AFCV				
Diagnostics	ASIP	ENSIP			
Prognostics	Aircraft Electrical Power Systems Prognostics-Health Management	Inline Health Monitoring for Aircraft Hydraulic Pumps	Engine-Bearing Health	Probabilistic-Life Modeling	ASIP ENSIP
Data Analysis	REMIS	ASIP	ENSIP		
Portable Maintenance Aids	POMX				
Integrated Information System	Air Force Portal	EDW			
Interactive Training					

Table 2. Nonweapon System Specific Initiatives

CBM+ Concepts	JTAV and RCM CBM+ Tools	
JTAV	GTN	Tracker
RCM	RCM Calculator	Weibull Tool

Table 3. RCM/JTAV CBM+ Tools

Capability Planning Instructions	Acquisition Instructions	Maintenance Instructions
CJCSI 3170.01	DoDI 5000.2	AFI 21-132
CJCSI 3170.01C	AFPD 63-2	AFI 21-101
AFPD 10-6	AFPD 63-6	AFI 63-107
AFPD 10-601	AFPD 63-10	
AFI 10-602	AFPD 63-14	
AFI 10-1401	AFI 63-101	
AFI 10-1901	AFI 63-123	
	AFI 63-201	
	AFI 63-1001	
	AFI 63-1101	

Table 4. Governing Directives Reviewed

all Air Force personnel via a common Web browser. Finally, we identified CBM+ tools employed within the Reliability-Centered Maintenance and Joint Total Asset Visibility concepts (Table 3). Although many of the listed systems and concepts predate the CBM+ concept itself, these technologies and concepts enable improved maintenance and logistics practices. Each initiative was described in detail within the full report, as well as the role each initiative played in the CBM+ concept for each individual weapon system. By identifying the initiatives, we provided a snapshot of the current levels of CBM+ integration already at work within the Air Force. An acronym listing for Tables 1, 2, and 3 can be found at the end of this article.

Recommend Implementation Policy

The proposed Air Force CBM+ definition emphasizes consideration of technologies, processes, and procedures throughout the life of a weapon system. Numerous governing directives and Air Force instructions impact the management of Air Force weapon systems from cradle to grave. Based on the knowledge gained while completing the first three objectives, the study team reviewed every directive we thought applicable to CBM+. Table 4 lists the directives reviewed.

We determined ten of the reviewed regulations affect CBM+ implementation and should be revised. We also determined where within the regulation the guidance should reside and then vetted these recommendations through the appropriate offices of primary responsibility. Personnel from the Headquarters Air Force Requirements Integration and Management Division, Office of the Secretary of the Air Force Management Policy and Program Integration, and AFM Development Planning Division validated the list of affected instructions.

After reviewing all potential definitions, the team proposed the following definition and goal for CBM+ within the Air Force.

> Condition-based maintenance (CBM) can be defined as a set of maintenance processes and capabilities derived from real-

> time assessment of weapon system conditions obtained from embedded sensors and/or external tests and measurements using portable equipment. The goal of CBM is to perform maintenance only upon evidence of need.
>
> CBM+ expands on these basic concepts, encompassing other technologies, processes, and procedures that enable improved maintenance and logistics practices. These future and existing technologies, processes and procedures will be addressed during the capabilities planning, acquisition, sustainment and disposal of a weapon system.

Our CBM+-proposed definition is the same as the DoD definition, with one exception. The proposed Air Force definition highlights the importance of including CBM+ considerations into the total life cycle of all weapon systems (to include missile systems). For CBM+ to be successful, these considerations must take place.

The enabling technologies and concepts identified by the MTSSG and the DUSD/L&MR were the only CBM+ technology and concept listings available. After consulting with functional experts, we have validated the MTSSG and DUSD/L&MR listings, finding that these technologies are, at a minimum, necessary to achieve the CBM+ vision. However, we reduced the listing of technologies and concepts from 11 to 10. The MTSSG listing included serial item management (SIM) as a technology. From our research, we concluded SIM is a part of automatic information technology (AIT) or, in other words, one of the functions of AIT. As Figure 1 illustrates, these technology categories presently cover the entire CBM+ process.

By cataloging CBM+ initiatives within the Air Force, we concluded the Air Force has numerous CBM+ initiatives. However, the Air Force lacks a formalized process to ensure CBM+ is considered throughout the life cycle of a weapon system.

The recommended procedural changes ensure these technologies and maintenance concepts (or new ones as technology matures) can be incorporated into the Air Force. Figure 2 illustrates Air Force instructions affected by the implementation of the concept, as well as points of contact, offices of responsibility, and actions that must be taken along the evolutionary acquisition time line for successful implementation of CBM+.

CBM+ technologies must be considered within the planning phase of the evolutionary acquisition process (see action required in the planning stage of Figure 2). Therefore, there must be a process making the acquisition and logistics communities aware of the technologies currently in work by the science and technology (S&T) community. From our research, we discovered AFMC has institutionalized a process for transitioning advanced technologies from the lab environment to the acquisition and logistics communities. This process involves an advanced technology council (ATC). The technologies available for transition are addressed in one (or more) of seven major ATCs (Air Education and Training Command, Air Combat Command, AFC2ISR, Air Force Special Operations Command, Air Mobility Command, AFMC, and Air Force Space Command). Technologies presented at the ATC are the product of lab S&T efforts. Prior to presentation at the ATC, a *champion* and *transition agent* are identified. The champion is the primary user of the technology (the depot, major command [MAJCOM], or program office), and the transition agent is usually the Aeronautical Systems Center (ASC) Aeronautical Enterprise Office's Aging Aircraft Program Office. Before the ATC meets, the transition agent, champion, and lab create a roadmap for implementation that includes a full story for each technology on how, when, and with what funding this technology will be handed from the lab to the transition agent and, ultimately, to the customer for implementation. When the ATC commissions or recommissions the technology, commitment is indicated to the transition and implementation plan.[1]

Summary

After comparing the DoD definition for CBM+ with definitions available from commercial sources and academia, we concluded that the DoD definition, along with a single additional sentence to add emphasis on the entire life-cycle management of a weapon system, is the best definition available for Air Force use.

The enabling technologies identified were based on a list previously reviewed by the DoD's senior maintenance technology leaders, the MTSSG. Similar technologies and concepts also were identified as *characteristics* that underpin CBM+ in a DoD interim policy letter. Based on the similarities in the ideas presented in these two documents, we concluded the MTSSG list of technologies, after minor revision, was the most complete listing of enabling technologies. Our review of the entire CBM process convinced us these technology categories presently cover the entire CBM+ process.

We concluded the Air Force lacks CBM+ policy implementation guidance in the areas of capabilities planning (formerly requirements determination), acquisition, and maintenance. Although the Air Force has numerous CBM+-like initiatives (that is, IMIS, Honeywell DataTrak), there is no *formal* process for implementation of the CBM+ concept or its oversight. We vetted our findings on Air Force policy through senior policy writers in each of the affected areas, and they concurred with our findings.

However, we did find that current DoD Instruction (DoDI) 5000.2, *Operation of the Defense Acquisition System,* provides limited guidance for CBM+ implementation and oversight. Paragraph 3.9.2.4 states:

> Program managers shall optimize operational readiness through affordable, integrated, embedded diagnostics and prognostics, and embedded training and testing, serial item management; automatic identification technology, and interactive technology refreshment.

We also found that many of the affected Air Force instructions and policy documents are currently being rewritten to coincide with instructions issued in DoDI 5000.2. We feel this provides the perfect opportunity for the Air Force to incorporate CBM+ into Air Force instructions.

The ATC process represents an acceptable process for transitioning those approved technologies (to include CBM+ technologies) from the labs to the acquisition and logistics communities. However, chairs of the ATC must ensure participation from the MAJCOMs, and the MAJCOMs and ASC must ensure appropriate participation from their programs (future and legacy).

	A	B (Program Initiation)	C	IOC	FOC
	Concept Refinement Concept Decision	Technology Development	System Development and Demonstration Design Readiness Review	Production and Deployment LRIP/IOT&E FRP Decision Review	Operations and Support
	Presystems Acquisition		Systems Acquisition		Sustainment
Stage of Development	Capabilities Planning	Acquisition Planning	Formal Acquisition and Initial Development	Initial Production of New Systems and Growth Capabilities	Concept Application
POC/OCR	HQ USAF/XOR	SAF AQX	Program/Single Manager and HQ/AFMC	Program/Single Manager and HQ/AFMC	HQ USAF/ILM and Applicable MAJCOM
Associated Publications	AFI 10-601 AFI 10-602 AFI 10-1901	AFI 63-107 AFPD 63-2 AFPD 63-14 AFI 63-123 AFI 63-201 DoDI 5000.2	AFI 63-107 AFPD 63-2 AFPD 63-14 AFI 63-123 AFI 63-201 DoDI 5000.2	AFI 63-107 AFPD 63-2 AFPD 63-14 AFI 63-123 AFI 63-201 DoDI 5000.2	AFI 21-101 AFI 63-107
Stage of CBM+ Integration	**PLAN**	**DESIGN**	**BUILD**	**BUY**	**UTILIZE**
Action Required by POC/OCR	Ensure consideration of CBM+ concepts into capabilities planning process.	Ensure integration of CBM+ concepts into acquisition planning and design. Research applicable technologies that incorporate CBM+ concepts.	Ensure application of CBM+ concepts incorporated in design phase during construction of test units.	Verify inclusion of CBM+ concepts previously identified and effectiveness of those CBM+ concepts when utilized. (IOT&E)	1) Implement tenets of CBM+ identified in AFI 21-101 2) Ensure compliance with CBM+ concepts within specific systems/programs 3) Provide feedback to Program/Single Manager

This is the proposed application of CBM+ outlined against the Evolutionary Acquisition Process Timeline
(Reference DoDI 5000.2 May 2003)

Figure 2. CBM+ and the Evolutionary Acquisition Process Time Line

Conclusions

- The current DoD definition for CBM+ should be modified to include total life-cycle considerations. This captures the importance of the entire weapon-system life cycle.
- The ten enabling technologies and concepts identified represent a complete baseline necessary to achieve the DoD vision for CBM+ at this time.
- The Air Force already has numerous CBM+ initiatives, covering each of the ten enabling technologies and concepts.
- Current Air Force policy that could affect CBM+ implementation needs to be revised to institutionalize CBM+.
- The ATC process represents an acceptable form of interaction between the Air Force S&T and logistics communities.

Table Acronym Listing

Table 1

SNT – Serial Number Tracking
IETM – Interactive Electronic Technical Manual
IMIS - Integrated Maintenance Information System
CITS – Central Integrated Test System
AFFIP – Aircraft Fault-Function Indicator Panel
MMP – Maintenance Monitor Panel
SEC – Support Equipment Computer
MFL – Maintenance Fault Listing
PFL – Pilot Fault Listing
EDNA – Enhanced Diagnostic Aid
DTC – Data Transfer Card
MWS – Maintenance Work Station
DRILS – Depot Repair Information Local Server
MTS – Maintenance Training System

Table 2

SNT – Serial Number Tracking
POMX – Point of Maintenance
AFCV – Air Force Common Viewer
ASIP – Aircraft Structural Integrity Program
ENSIP – Engine Structural Integrity Program
REMIS – Reliability Maintainability Information System
EDW – Enterprise Data Warehouse

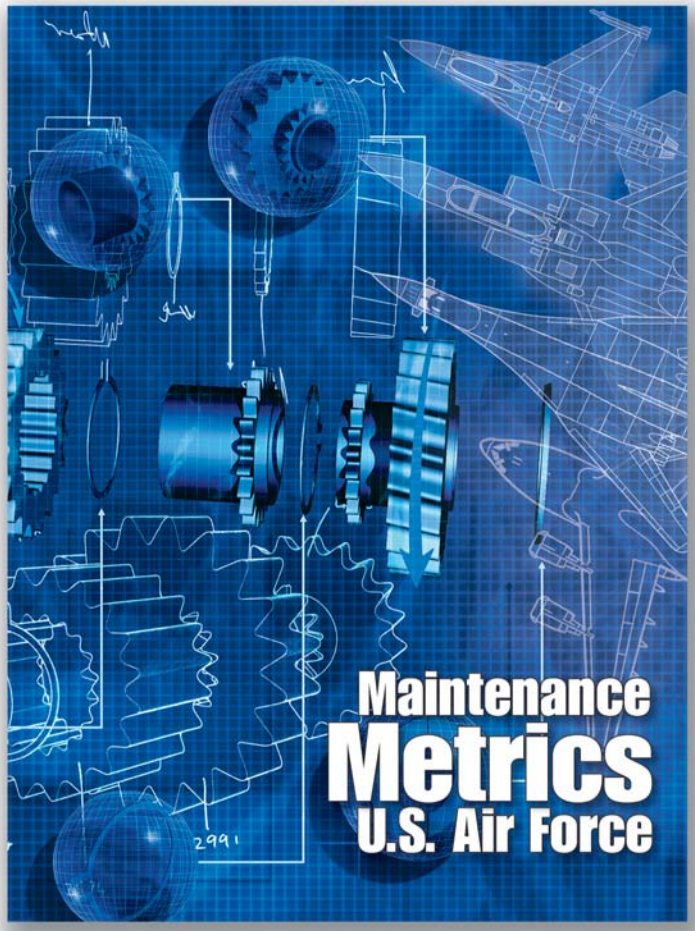
Table 3

JTAV – Joint Total Asset Visibility
RCM – Reliability Centered Maintenance
GTN – Global Tracking Network

Notes

1. Maj J. Specht, HQ AFMC/DRXI, personal correspondence/e-mail, 23 Sep 03.

Electronic Version Available



"All successful maintenance operations begin and end with metrics."

The *Maintenance Metrics Handbook* provides maintenance leaders, at both the wing and major command levels, a comprehensive guide to the key metrics associated with aircraft maintenance management. When the *old heads* take a look, undoubtedly, the first thing they will say is, "Hey, there's nothing new here." And they will be right. This is *not* new information. The problem is, however, over the last few years, there has not been the, shall we say, *emphasis* placed on tracking, understanding, and using this stuff like there was in the old days. Admittedly, the approach to *stats*—as metrics were called—was a little on the harsh side back then, to say the least. But that didn't mean they were unimportant or to be ignored. That was true then, and it's true now. Unfortunately, with the lack of interest in metrics over the last 10 years, we have grown a crop of maintainers who neither know why metrics are important nor understand how to use them. They miss the point that metrics, essentially, are the "roadmap that lets you determine where you've been, where you're going, and how (or if) you're going to get there." Additionally, stats knowledge embedded in the old guys may have atrophied somewhat over these same years, and that's a problem, too. This situation needs to be turned around, and this book is designed to help.

It not only serves as an encyclopedia of metrics but also touches on key maintenance management issues and includes a brief description of things to consider when analyzing fleet statistics, as well as an explanation of data that can be used to perform analysis. This is followed by a detailed description of each metric, a formula to calculate the metric, and an explanation of the metric's importance and relationship to other metrics. The handbook identifies which are leading indicators (predictive) and which are lagging indicators (historical). The final chapter is a guide for data investigation.

CAD/PAD Items

Is there a better way to manage them?

Senior Master Sergeant Eric W. Pickett

Cartridge-actuated devices and propellant-actuated devices (CAD/PAD) are used primarily to separate the aircraft from the pilot and crew. The ejection seat has numerous CAD/PAD items with different shelf and service lives that must be taken into consideration. Ordering these time change items is a critical aspect of keeping aircraft mission ready. However, determining the most efficient method to manage CAD/PAD is difficult. Presently, the Air Force views CAD/PAD as a munitions item. However, CAD/PAD has some of the same distinct characteristics of an aircraft part and could be treated as a spare part in resupply. This classification affects the funding of CAD/PAD, where they are stored, what supply system is used for resupply, and who is involved with handling them. The Air Force Logistics Management Agency will be studying how CAD/PAD is managed to determine if the Air Force is using the most efficient and effective method.

If CAD/PAD is classified as a munitions item, as it is today, then the Air Force uses appropriation 3011 money. This *color* of money is designated for buying all ammunition items, to include accessories such as fins and arming wire. This funding flows from Headquarters Air Force down to the air logistics center (ALC) at Hill AFB, Utah, where item managers for each CAD/PAD part contract with the manufacture years in advance of the need for a particular CAD/PAD item. The needed item then is shipped to the unit—without charge to the unit. It goes into the Combat Ammunition System (munitions supply known as CAS) at the final destination, is inspected by munitions personnel upon receipt, and is stored in the munitions storage area until called for by the end user (usually the egress shop).

If CAD/PAD is classified as an aircraft spare part, then it could affect the resupply effort significantly. The most likely effects would be that the funding appropriation would change to operation and maintenance (also known as appropriation 3400 money). This *color of money* is decentralized and managed at the unit level rather than the ALC. How this would affect the purchase of CAD/PAD is not clear. The thinking now is, reclassification would also affect the role the ALC plays in this process. Another significant effect would be which supply system should be used. Instead of CAS managing the resupply, it could be done like other aircraft parts in the Standard Base Supply System. While there are advantages to both supply methods, it is not clear how these CAD/PAD items will be handled. How much munitions personnel are involved and what kind of inspections will be required are other issues that need to be looked at.

This study will investigate CAD/PAD as a munitions item or as an aircraft spare to determine which concept works best for the Air Force. By evaluating the funding, supply methods, storage, and personnel-handling issues, the best method to manage CAD/PAD should become apparent. AFLMA then will recommend the best course of action from the alternatives. Then the process owners at Air Force level will decide the path CAD/PAD will take. The results of this study should be completed and published sometime in fiscal year 2004.

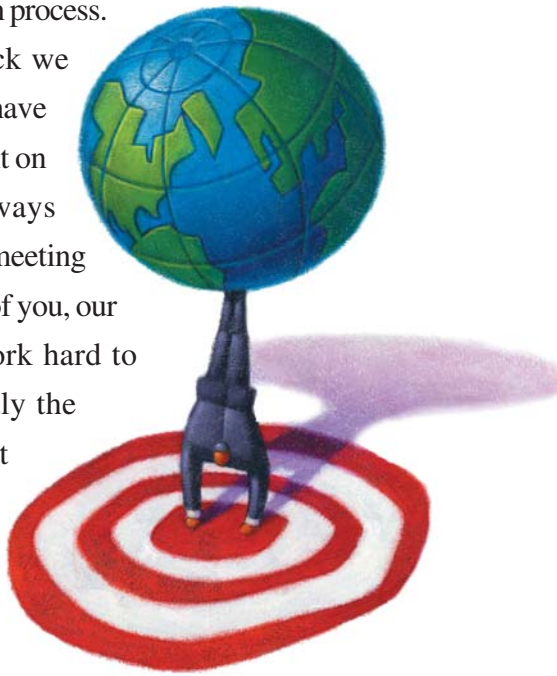
Lieutenant Colonel Kim C. Triesler, CPCM

Meeting *your* Needs

Reaching Out and Forging Ahead

Since our recent spate of completed projects, we decided to be smarter in our approach to projects. We feel our in-house processes can be improved, allowing us to reduce the paperwork and streamline the soft-copy flow of data, which could shorten the time it takes to complete a project. Ultimately, our plan is to reduce the project timespan as much as possible while maintaining the quality edge for which we are known. This might have an additional positive impact by allowing us to process more projects per man-year than we have accomplished in prior years.

With that said, if we thought 2002 was a good year for us projectwise, then it is safe to say that 2003 has been a banner year, and you, ultimately, received the benefit of our work. We are extremely pleased to announce that, as of press time, we have completed eight taskings and have at least three more projects in process. From some of the feedback we have received, it seems we have hit our assigned targets right on the mark. And we are always pleased to hear that we are meeting the needs and expectations of you, our valued customers. We work hard to ensure we give you exactly the right material or support needed to do your job. Continuing along with our reputation for excellence, we will



We currently are focused on three projects: Enterprise Resource Planning Market Research Initiative, Enterprise Architecture for Procurement Organizational Process Change Impact Study, and Commodity Council Lessons Learned and How-to Recommendations.

Contracting

always stay focused on putting out quality work for you each and every time.

2003 Projects and Studies

As mentioned previously, we currently are focused on three projects. They are the Enterprise Resource Planning Market Research Initiative, Enterprise Architecture for Procurement Organizational Process Change Impact Study, and Commodity Council Lessons Learned and How-to Recommendations. Some of our recently completed projects are listed as well to give you a flavor of what we can do and have, in fact, accomplished. They are all consulting efforts and important parts in Air Force plans to modernize the information technology systems used in the logistics and contracting communities and get up to speed with the best industry practices available.

Contingency Contracting Handbook

We *kicked the can down the street* on this project far longer than usual, and shortly after I arrived at AFLMA, it became apparent that we had missed the mark set by our customers. However, rather than go back and reinvent the wheel, we felt we had a lot of good information, even though it was not in the best format and was not as clear and succinct as it could be. It was a very easy decision to turn this over to my best senior noncommissioned officer, who did an absolutely incredible job of focusing on the customers' expectations and feedback and produced the *Contingency Contracting Handbook* that has garnered rave reviews from many different quarters. First of all, he *rewickered* it down in size so that it is easy to read, is brief and succinct, and readily fits into the BDU cargo pants pockets. It is for field use but is an excellent training tool as well. The demand for the handbook has been such that we have gone back to the publisher for a reprint and have been asked by numerous outside agencies for copies so they may incorporate it into their training. This is a classic example of *imitation being the highest form of a compliment*, and we are delighted so many agencies want to use our handbook for their contingency contracting officer purposes.

Operational-Level Pricing

We were tasked to review and analyze operational pricing reasonableness and then develop supporting contracting pricing tools in a consulting role. We helped prepare the Air Force Pricing Analysis Tool that we posted on an independent Web site to get as much participant data as possible. Shortly thereafter, we did a thorough analysis of the data, *slicing and dicing* it in an almost endless series of comparisons, looking for any potential correlations between the various data points. In the end, we provided results to our customer for them to make a final determination of what to do with the resultant data.

Spend Analysis of Operational Contracting

This project was unique in that we conducted a detailed analysis of the dollars we spend (called the *spend*) and contracting actions awarded throughout operational contracting units. This aligns with ongoing procurement transformation strategy efforts of the Deputy Secretary of the Air Force (Contracting). The ultimate goal is to give our senior contracting leaders current and accurate information on how and where procurement money is spent so they can successfully steer recently initiated procurement transformation efforts. This study carefully documented the methodology developed and executed to achieve the results so future iterations of the same study can be executed rapidly. This will enable a viable analysis of data, using the same methodology in a true apples-to-apples comparison, whenever the need arises. This project was completed in January 2003 and is available for any unit, major command, or Air Staff person to use for analysis of spending trends. This will enable contracting personnel to determine where the money is flowing in order to take advantage of opportunities to negotiate price reductions for services, materials, or products where there is a large volume of business being generated to various vendors or contractors.

Financial Analysis Tools Guide

Unfortunately, there have been times when contracts were awarded to financially risky contractors, which resulted in negative impacts to the end users and procurement personnel. In some instances, the contractors failed to live up to their end of the contractual agreement, which caused a delay of the final products or services to the end users and caused the contracting personnel to take immediate

2003

action to expeditiously reissue contracts to other suitable vendors. Our goal was to develop an easy-to-use financial analysis tools guide that will help contracting officers and contract administrators use the right mix of financial analysis tools to determine the financial viability of firms before any contracts are issued. This may entail a bit more work, but it should be a lot less painful than having to award another contract for the same services or items that were not delivered by a failed firm. In essence, this is a buyer-beware instruction set that we feel will be of immeasurable value to contracting personnel.

Added Information

As you well know, our career field is heading into some new and exciting territory such as the e-Business initiatives. We have been asked to combine our talents and efforts to help the Air Staff forge an e-Business path for our career field, recognizing there are goals that we must meet because of Federal mandates and because it is the right thing to do and prudent business as well. Therefore, most of our time will be spent on working on these initiatives for the foreseeable future as we work toward meeting the time-critical deadlines and then moving on to the next logical step in the process.

Additionally, most of our improvement study projects are given to our Air Staff counterparts, who oftentimes post all or part of our project material on the Deputy Assistant Secretary of the Air Force (Contracting) Toolkit. Conversely, there are times when our work is that of providing consulting services, and our customers take our finished work under advisement only.

Completed 2003 Projects

- *Air Force Construction Contracting Guide*
  LC200302201—Improvement Study (Canceled due to discovery of acceptable substitute based on CON 244 Construction Contracting training material.)
- Spend Analysis of Operational Contracting
  LC200200216101—Improvement Study
- *Contingency Contracting Handbook*
  LC200000405—Improvement Study
- Contingency Contracting Doctrine *Fire Brigade*
  LC200231200—Consulting Report
- Air Force Pricing Assessment
  LC200226100—Consulting Report
- *Financial Analysis Tools Reference Guide*
  LC200216100—Improvement Study
- *Contract Payment Guide*
  LC200302202—Improvement Study
- Commodity Council Opportunity Analysis
  LC2003265000—Consulting Report

Contracting Division

- Commodity Council Lessons Learned and How-to Recommendations
  LC200228804—Consulting Study
- Enterprise Architecture for Procurement Organizational Process Change Impact Analysis
  LC200328805—Consulting Study
- Enterprise Resource Planning Market Research
  LC200316701—Consulting Study
- Conferences, Training, and Consulting Support
  LC200300700—Consulting Study
- Contracting to Support Contingencies: Lessons from Recent Operations
  LC200401600—Consulting Study

Lieutenant Colonel Kim C. Triesler
Lieutenant Colonel Tim Reed, SAF/AQCA
Major Michael E. Knipper
Master Sergeant Aaron Kelly

Spend Procurement *Analysis*

Improving Enterprise Buying Decisions

Background

The findings in this report contain only a sample analysis, which will provide the basis of future studies. The data we gathered were reviewed and then briefed at the 2003 Worldwide Contracting Training Conference. It is important to note that this research is a key step in developing tomorrow's acquisition policy. The sponsor for this consulting effort was Under Secretary of the Air Force for Acquisitions (Contracting) (SAF Contracting).

In calendar year 2001, SAF Contracting authorized the formation of the Procurement Transformation Strategy Integrated Product Team (IPT) and granted them the authority to execute a charter to develop (1) an unconstrained vision of what the Air Force procurement community might look like in the future, (2) an assessment of the actions needed to achieve that vision, (3) the alternative strategies and associated cost and benefit analysis, and (4) a recommended implementation plan for action by the Air Force. SAF Contracting then tasked

KPMG Consulting, Inc, to facilitate the IPT and investigate and develop a strategy to transform the pillars of the acquisition community—(1) policies, (2) processes, (3) personnel, and (4) related technologies—to meet the needs of a transforming Air Force. Much of the research associated with the previous studies identified the need to establish commodity councils at the enterprise level. In particular, AFLMA's research includes an investigation of the how, what, and where the Air Force spends money to identify organizations, areas, or locations that could be appointed to establish a commodity council strategy and assume responsibility for executing the strategy.

Leveraging the Air Force Spend

Leveraging is not a new concept. It is the same principle that farmers use when they join a co-op. The consumer public uses leveraging if they purchase a Sam's Club membership. The idea is that buying larger quantities results in a lower unit cost. As a result, those savings ultimately are passed on to the customer. In the case of the Air Force, the savings ultimately will be passed on to the warfighter.

Leverage, for our purposes, is gained by using economies of scale. Volume leveraging is the number one strategy for purchasing cost reductions. A recent study indicated that the average cost reduction goal is 12 percent for manufacturing firms (*Purchasing Magazine*, 2002).

Problem

In most cases, the Air Force has very little visibility into how it spends the bulk of its appropriated money. Even though there are numerous contract-reporting databases that compile information, the anomaly is that much of the information is not assessed at the enterprise level. In recent years, the General Accounting Office has emphasized that all federal agencies initiate efforts to conduct a thorough spend analysis. Principally, the idea is that spend analysis data will allow federal agencies to forecast requirements more accurately. It also will allow the Air Force to achieve significant cost reductions through the use of bundling similar requirements. The assumption is that commodity councils will help the Air Force achieve savings by making buying decisions at the enterprise level. This has worked quite well in private industry, and we fully agree with this assumption. For example, Table 1 illustrates the savings associated with consolidating requirements for desktop and laptop computers in 2003. This application is definitely transferable to other products and services.

Product Type (FY03 Data)	Air Force Average Cost Per Unit	Medical Services Leveraged Quantity	PACAF Leverage Multi-Year Buy
Desktops	$1,200	$1,024	$1,090
Laptops	$2,127	$1,591	$1,947

Table 1. SAF Contracting Briefing, 21 October 2003

By 2005, the Air Force plans to implement a commodity-council structure in either product or service areas to corporately leverage its spend. As part of the larger Department of Defense (DoD) strategy, the Secretary of Defense has envisioned a more efficient logistics strategy, including the procurement processes. His vision incorporates aspects from industry leaders, such as IBM. In terms of the IBM model, the Air Force is in the initial stages of creating commodity councils. Our research is strictly preliminary and, thus, lays the groundwork for identifying product and service areas, which might be potential candidates for commodity councils. In no way does this research represent the best candidates for commodity councils. Any determinations for potential commodity councils should be made based on a combination of spend analysis data and commonsense data.

Research Objectives

The overall objective of this consulting effort was to consolidate and analyze the Air Force spend data over the last 3 fiscal years (FY) to aid senior Air Force leaders in determining what commodities and services could be sourced strategically during the initial transformation phase. In general, the recommendations developed during this analysis will produce initial changes across the acquisition field based on the data results and commonsense approach. Some commodity councils will be based on a product and service category or perhaps a geographical location. As such, our efforts were aimed at identifying potential commodities and services that seemed ready for leveraging while determining possible locations for the recommended councils. The effort also produced a consolidated listing of commodity councils set up in major commands (MAJCOM) or similar centralized contracting actions currently in use. Last, a briefing was developed for use at the Air Force Worldwide Contracting Conference 2003.

Recommendations were consistent with the following SAF Contracting transformation goals and objectives:

- Identify spend data by pulling DD350 and DD1057 information from the SAF Contract Support Division and Defense Information System Agency information warehouses.
- Make recommendations based on dollars spent or number of contract actions that will help policy makers identify the commodity or services that lend themselves as candidates for future commodity councils.
- Lay the groundwork for future studies, which includes a commodity council how-to guide and an investigation of organizational process change based on a new Enterprise Architecture for Procurement.

Methodology

The methodology executed under this analysis uses data from various sources:

FSC Code	Total
1510 Aircraft, Fixed Wing	$33,291,378,280
2840 Gas Turbines and Jet Engines, Aircraft	$6,322,085,354
R414 Systems Engineering Services	$3,542,369,460
1560 Airframe Structural Components	$2,957,617,688
AC15 Defense Aircraft	$2,841,613,153
V121 Air Charter for Things	$2,612,522,400
L014 Technical Representation Services	$2,418,824,733
1325 Bombs	$2,394,463,060
AC23 Defense Missile and Space Systems	$2,257,401,640
R425 Engineering and Technical Services	$2,077,941,228
V221 Passenger Air Charter Service	$2,038,979,562
1810 Space Vehicles	$1,849,509,193
AC25 Defense Missile and Space Systems	$1,781,966,015
H216 Equipment and Materials Testing	$1,752,865,400
1680 Miscellaneous Aircraft Accessories	$1,742,625,293
AZ13 Other Research and Development Total	$1,591,322,400
J015 Maintenance, Repair, and Rebuilding of Equipment	$1,574,297,514
9999 Miscellaneous	$1,548,783,628
D399 Other ADP and Telecommunications Services	$1,474,331,809
AR25 Space Science and Applications	$1,457,171,084
AC65 Defense Electronics and Communication Equipment	$1,437,061,398
AC22 Defense Missile and Space Systems	$1,299,490,152
AC14 Defense Aircraft	$1,269,324,092
1410 Guided Missiles	$1,194,436,182
S216 Facilities Operations Support Services	$1,173,566,244
Grand Total	**$83,901,946,962**

Table 2. Top 25 FSCs by Dollars Spent

- The *DD350 Year to Date Control Register* available (through the SAF Contracting Web site) at https://www.dd350online.hq.af.mil/index1.cfm
- DD Form 1057 data provided by the SAF Contracting Support Division
- MAJCOM survey data requested and collected by AFLMA

Steps taken:

- Identify the total Air Force procurement spend for FY01 through FY03.
- Collect DD350 and DD1057 data and consolidate using SPSS (©2003) and Microsoft Excel (©2003).
- Present a breakout of the dollars spent and total number of actions by buying activity (for example, Air Force bases, MAJCOM, geographic region).
- Present a breakout of the spend by Federal Supply Code and North American Industrial Classification System (NAIC).
- Analyze the existing commodity council-like activities around the Air Force contracting community.
- Propose locations for future commodity councils by using *total dollars spent* or *number of actions* data.

Analysis and Results

The overall spend analysis was conducted during the initial stages of the effort. This analysis combined *all* the DD350 and DD1057 data, resulting in more than 160,000 lines of data. Once these data were captured, the overall spend for the last 3 fiscal years was aggregated into 46,000 lines of interpretable data. A generic summary concerning that data is listed below:

- Total Air Force spend for FY01 through FY03 (minus Government Purchase Card data) = $138,896,039,125.
- Including both obligations and de-obligations, the total number of actions = 180,134.
- The Air Force Materiel Command (AFMC) had the highest spend, totaling more than $107B, 30 percent of which was spent on aircraft.
- Patrick AFB, Florida, had the highest spend among operational bases at $954M.
- The largest state in terms of contractor revenue over the 3-year period was California, at more than $32B.

The next step—and much of the article that follows—involved aggregating the data and sorting it by federal supply class (FSC). Table 2 lists the amount spent on the top 25 aggregate supplies and services.

By using the top 25 FSCs, we have visibility of approximately 61 percent of the Air Force total spend ($84B and $138B). Of the 25 FSC categories, only 5 were assessed as potential commodity council candidates, which are highlighted above. The nonhighlighted categories fall into the systems and research and development (R&D) procurement realm. Per our sponsor's direction, most systems and R&D products and services were not

considered as candidates for commodity councils. It is interesting to note that there are still some concerns over program management authority and accountability within the program offices of major systems. In addition to the highlighted categories, we examined other commodity and service FSCs based on input from the Air Force MAJCOMs. These included utilities (S112), food services (S203), office furniture (7110), and industrial trucks and trailers (3930). As a real curiosity factor, we have highlighted FSC 9999. A coding of 9999 on the DD350 entry represents *miscellaneous* and is, therefore, a catchall category. The benefit of entering the proper FSC on a DD350 is that it provides visibility into what the Air Force spends money on. If a particular buy is coded 9999, there must be a legitimate reason for doing so and must be an exception rather than the rule since a great deal of *buying data* visibility is lost. In terms of the 9999 FSC data, we have lost more than $1.5B in *spend* visibility.

Proposed Councils by FSC Dollars Spent

Recommendations

These recommendations were also briefed at the 2003 Worldwide Contracting Training Conference.

- The Air Force procurement community establish a commodity council for systems engineering at Oklahoma City Air Logistics Center (OC-ALC)—Table 3.
- Based on the similarity between V221 and V121, these two categories be combined into one commodity council and located at Scott AFB, Illinois—Tables 4 and 5.
- An automated data-processing (ADP) and telecommunications services commodity council be established at Wright-Patterson AFB, Ohio (Materiel Systems Group Contracting Office)—Table 6. This recommendation may or may not be feasible based on the existing IT commodity council established at Standard Systems Group (SSG) Maxwell AFB, Gunter Annex, Alabama. It is expected that SSG will assume responsibilities for this FSC under its current strategy.
- A facilities operations support services commodity council be established at Tyndall AFB, Florida—Table 7.

Other FSC Categories Analyzed

Recommendations

- Commodity councils should be established by individual Air Force commands. Using this model, Yokota AB, Japan, would set up a commodity council for Pacific Air Forces (PACAF); Vandenberg AFB, California, for Air Force Space Command (AFSPC); Arnold AFB, Tennessee, for AFMC; and Goodfellow AFB, Texas, for Air Education and Training Command (AETC). Furthermore, we also proposed an alternative geographic breakdown. For example, we would assign

Base – Office	Total
Oklahoma City – OC-ALC/LAD	$554,151,960
Wright-Patterson – ASC/RWKR	$349,397,746
Hill – OO-ALC/LGK	$270,598,004
Oklahoma City – OC-ALC/LKD	$260,772,159
Warner Robins – WR-ALC/LNK	$244,048,544
Warner Robins – WRALC/LFK	$212,033,543
Warner Robins – WR-ALC/LUK	$184,897,606
Hill – OO-ALC/LFK	$173,036,483
Grand Total	**$2,248,936,045**

Table 3. R414 Systems Engineering Services

Base – Office	Total
Scott – HQ AMC/DOY	$2,611,047,555
Warner Robins – WR-ALC/PKO	$1,195,690
Eielson – 354 CONS	$205,360
Ramstein – HQ USAFE	$51,772
Yokota – 374 CONS	$22,023
Grand Total	**$2,612,522,400**

Table 4. V121 Air Charter for Things

Base – Office	Total
Scott – HQ AMC/DOY	$2,037,174,306
Wright-Patterson – AFSAC/PK	$1,805,256
Grand Total	**$2,038,979,562**

Table 5. V221 Passenger Air Charter Service

Base – Office	Total
Wright-Patterson – MSG/PK	$384,771,499
Tinker – 38 EIG	$214,837,674
Wright Patterson – ASC/PKWO	$195,432,547
Scott – AMC/LGC	$178,284,245
Randolph – 12 CONS	$135,022,236
Schriever – 50 CONS	$104,932,393
Grand Total	**$1,213,280,594**

Table 6. D399 Other ADP and Telecommunications Services

Base – Office	Total
Tyndall – 325 CONS	$522,185,216
Incirlik Turkey – 39 CONS	$110,073,701
Hickam – 15 CONS	$96,609,585
Shaw – HQ CENTAF/LGC	$84,208,943
Ramstein – HQ USAFE	$39,544,844
Laughlin – 47 CONS	$29,650,634
Grand Total	**$882,272,923**

Table 7. S216 Facilities Operations Support Services

Goodfellow contracting personnel to work all the utilities contracts for the Air Force bases in Texas—Table 8.

- Food service commodity councils be established by states or geographic regions. Hypothetically, Sheppard AFB, Texas, could set up food services contracts for Texas, Louisiana, Mississippi, Arkansas, and Oklahoma. Maxwell could potentially set up food services contracts for Alabama, Georgia, Florida, Tennessee, and South Carolina—Table 9
- A commodity council for office furniture be established at Ogden Air Logistics Center (OO-ALC) (Hill AFB, Utah)—Table 10.
- A commodity council covering trucks, tractors, and trailers be established at Warner Robins Air Logistics Center (WR-ALC) (Robins AFB, Georgia)—Table 11.

Once again, we did not analyze systems and R&D FSCs. Highlighted FSCs are included as recommendations for commodity councils or confirmed previous recommendations based on both dollars and actions. During the Worldwide Contracting Training Conference, there was no mention of a construction commodity council. Since that time, there has been discussion regarding the possibility of such a council. As a result, we analyzed construction in terms of actions in the FSC breakout (Z199) and for both dollars and actions in the North American Industry Classification System (NAICS) (aggregate) breakout—Table 12.

- We do not recommend that one base be designated as the lead for construction contracts—Table 13. Instead, each of the bases listed should participate during the strategy phase of a construction commodity council. Under the NAICS breakouts, there are several categories for construction addressed on the aggregate.
- The SSG Contracting Directorate does the majority of system configuration contracts. As such, this lends credence as to why the IT commodity council was established at SSG—Table 14.
- Brooks AFB, Texas, be designated as the lead for the architect and engineering services commodity council—Tables 15 and 16.

For the same reasons discussed previously, the systems and R&D information has not been included in the analysis. Much of the NAICS data confirmed the findings from the FSC data. In conducting the spend analysis, it seems that the NAICS data are much more generic. This is based on the top 25 NAICS representing 82 percent ($113B and $138B) of the total Air Force spend from 2001 to 2003 as opposed to the 61 percent ($84B and $138B) captured by the top 25 FSCs—Table 17. Once again, we highlighted 999990 as the *miscellaneous* identifier. Unfortunately, we have lost the spend visibility for $1.4B. In addition, we consolidated all the construction NAICS (that is, 23XXXX) data into one category. As a whole, this constitutes an additional $3.4B of the $138B total Air Force *spend*.

Base – Office	Total
Yokota – 374 CONS	$70,387,641
Vandenberg – 30 CONS	$62,865,905
Arnold – AEDC/PKP	$46,601,213
Goodfellow – 17 CONS	$37,123,410
Wright-Patterson – ASC/PKWO	$32,617,584
Oklahoma City – ALC/PKO	$19,181,381
Little Rock – 314 CONS	$18,730,148
Offutt – 55 CONS	$18,265,323
Grand Total	**$305,772,605**

Table 8. S112 Utilities and Electric Services

Base – Office	Total
Sheppard – 82 CONS	$37,975,457
Lackland – 37 CONS	$33,311,694
Maxwell – 42 CONS	$32,277,198
Keesler – 81 CONS	$15,037,228
Travis – 60 CONS	$12,636,404
Andrews – 89 CONS	$12,280,290
Vandenberg – 30 CONS	$10,430,831
Nellis – 99 CONS	$9,997,477
Goodfellow – 17 CONS	$7,440,623
Peterson – 21 CONS	$7,267,851
Grand Total	**$178,655,053**

Table 9. S203 Food Services

Base – Office	Total
Hill – OO-ALC/PKO	$35,387,011
Ramstein – HQ USAFE	$18,548,991
Oklahoma City – OC-ALC/PKO	$18,068,650
Warner Robins – WR-ALC/PKO	$17,478,125
Vandenberg – 30 CONS	$16,001,037
Hanscom – ESC/JSK	$15,429,585
Lackland – 37 CONS	$11,957,132
Wright-Patterson – ASC/PKWO	$11,525,231
Air Force Academy – 10 ABW	$8,818,400
Maxwell – 42 CONS	$6,414,700
Grand Total	**$159,628,862**

Table 10. 7110 Office Furniture

Base – Office	Total
Warner Robins – WR-ALC/LVK	$265,370,513
Dyess – 7 CONS	$4,323,550
Randolph – 12 CONS	$439,491
Ramstein – HQ USAFE	$387,754
Oklahoma City – OC-ALC/PKO	$272,716
Grand Total	**$270,794,024**

Table 11. 3930 Industrial Trucks, Tractors, and Trailers

FSC Code	Total
Z199 Maintenance, Repair or Alteration of Real Property	6,228
V221 Passenger Air Charter Service	4,518
7010 ADPE System Configuration	4,326
R414 Systems Engineering Services	4,240
Z111 Maintenance./Repair Office Buildings	4,067
C211 Architect - Engineer Services	3,653
D399 Other ADP and Telecommunications Services	3,548
AD92 Other Defense R&D	3,334
2840 Gas Turbines and Jet Engines, Aircraft	3,246
J070 Maintenance, Repair, and Rebuilding of Equipment	2,992
1510 Aircraft, Fixed Wing	2,887
R425 Engineering and Technical Services	2,766
7110 Office Furniture	2,585
R499 Other Professional Services	2,560
C219 Other Architect and Engineering Services	2,540
Z119 Maintenance/Repair Other Administration Facilities and Service Buildings	2,381
V121 Air Charter for Things	2,176
7030 ADP Software	2,055
1560 Airframe Structural Components	2,055
7025 ADP Input/Output and Storage Devices	1,984
Z161 Maintenance/Repair Family Housing	1,903
J015 Maintenance, Repair, and Rebuilding of Equipment	1,873
R421 Technical Assistance	1,756
R408 Program Management/Support Services	1,754
Z299 Maintenance/Repair other Nonbuilding Facilities	1,705
Z222 Maintenance/Repair of Highways/Roads/Bridges	1,533

Table 12. Top 25 FSCs by Number of Actions

Base – Office	Total
Warner Robins – WR-ALC/PKO	486
Peterson – 21 CONS	342
Tyndall – 325 CONS	338
Vandenberg – 30 CONS	330
Lackland – 37 CONS	320
Wright Patterson – ASC/PKWO	259
Eglin – AAC/PKO	252
Patrick – 45 CONS	245
Moody – 347 CONS	245
McChord – 62 CONS	241
Grand Total	**3,058**

Table 13. Z199 Maintenance, Repair of Real Property

Base – Office	Total
Gunter – HQ SSG/PK	1,232
Wright-Patterson – ASC/PKW	328
Wright-Patterson – ASC/PKWO	259
Hill – OO-ALC/PKO	192
Hulburt Field – 16 CONS	175
Wright-Patterson – MSG/PK	110
Griffiss – AFRL/JFKO	110
Grand Total	**2,406**

Table 14. ADPE System Configuration

Base – Office	Total
Brooks – HSW/PKV	906
Randolph – HQ AETC	432
Air Force Academy – 10 ABW	235
Oklahoma City – ALC/PKO	156
Brooks – HSW/PKO	144
Warner Robins – WR-ALC/PKO	139
Grand Total	**2,012**

Table 15. C211 A&E Services

Base – Office	Total
Brooks – HSW/PKV	1,595
Malstrom – 341 CONS	124
Vandenberg – 30 CONS	102
Arnold – AEDC/PKP	99
Kirtland, Det 8 – AFRL/PK	86
Brooks – HSW/PKOM	65
Hill – OO-ALC/PKO	65
Grand Total	**2,136**

Table 16. Other A&E Services

NAICS CODE	Total
336411 Aircraft Manufacturing	$31,472,826,011
336413 Other Aircraft Parts and Auxiliary Equipment Manufacturing	$11,410,955,745
541710 Research and Development in the Physical, Engineering, and Life Sciences	$10,854,341,565
541330 Engineering Services	$9,781,822,353
336412 Aircraft Engine and Engine Parts Manufacturing	$7,700,487,084
334511 Search, Detection, Aeronautical, and Nautical System and Instrument Manufacturing	$6,483,611,431
921190 Other General Government Support	$5,392,191,449
336414 Guided Missile and Space Vehicle Manufacturing	$3,894,951,615
561210 Facilities Support Services	$3,073,407,235
481212 Nonscheduled Chartered Freight Air Transportation	$2,394,099,714
541990 All Other Professional, Scientific, and Technical Services	$2,349,596,223
334290 Other Communications Equipment Manufacturing	$2,099,422,692
334220 Radio and TV Broadcasting and Wireless Communication Equipment Manufacturing	$1,826,316,056
541519 Other Computer-Related Services	$1,587,865,107
332993 Ammunition (Except Small Arms) Manufacturing	$1,517,961,604
999990 Miscellaneous	$1,435,693,138
541512 Computer Systems Design Services	$1,429,682,901
334411 Electron Tube Manufacturing	$1,240,030,113
488190 Other Support Activities for Air Transportation	$1,088,928,733
92119 Other General Government Support	$995,517,242
811212 Computer and Office Machine Repair and Maintenance	$915,932,376
927110 Space Research and Technology	$911,858,018
481112 Scheduled Freight Air Transportation	$891,004,623
334111 Electronic Computer Manufacturing	$843,900,860
Grand Total	**$113,061,996,989**

Table 17. Top 25 NAICS by Dollars Spent

- Designate Tyndall AFB, Florida, as the lead for a facilities support services commodity council—Table 18.
- For purposes of this article, 481212 and 481112 were combined into one council. The NAICS data support the previous FSC analysis and our recommendation that Headquarters Air Mobility Command (AMC) Airlift Contracting be appointed as the lead for the air charter commodity council—Tables 19 and 20.

Table 21 lists the top bases in each MAJCOM or direct reporting (DRU) and field operating agency (FOA) for construction. These bases comprise $755M of the $3.4B total Air Force construction *spend.* Once again, we do not recommend that one base be designated as the lead for construction contracts.

Tables 21 through 27 and the discussion that follows provides additional support for the recommendations made.

The three construction NAICS categories from the top 25 listing (that is, 234110, 236220, and 233320) have been combined into one category for analysis—Table 22. The other highlighted categories are analyzed in terms of actions for councils previously recommended.

Once again, Tyndall has the most actions for facilities support services—Table 23.

Although Brooks did not have the largest number of actions for this category, we still recommend a commodity council be established there, as they are the largest spender for A&E services—Table 24.

Base – Office	Total
Tyndall – 325 CONS	$588,867,261
Patrick – 45 CONS	$381,329,374
Eglin – AAC/PKZ	$204,339,840
Elmendorf – 3 CONS	$186,214,219
Randolph – HQ AETC	$170,447,589
MacDill – 6 CONS	$145,969,774
APO AE Copenhagen – Det 1, 21 CONS	$131,226,004
Grand Total	**$1,808,394,061**

Table 18. 561210 Facilities Support Services

Base – Office	Total
Scott – HQ AMC/DOY	$2,393,319,520
Wright-Patterson – ASC/PKWO	$290,400
Hulburt Field – 16 CONS	$249,916
Lackland – 37 CONS	$84,152
Peterson – 21 CONS	$60,000
Eglin – AAC/PKO	$48,726
Ramstein – HQ USAFE	$47,000
Grand Total	**$2,394,099,714**

Table 19. 481212 Nonscheduled Charter Freight Air Service

Base – Office	Total
Scott – HQ AMC/DOY	$889,128,260
Hickam – 15 CONS	$1,529,163
Wright-Patterson – ASC/PKWO	$263,000
Davis Monthan – 355 CONS	$110,000
Wright-Patterson – AFSAC/PK	$1,200
Grand Total	**$891,031,623**

Table 20. 481112 Scheduled Freight Air Transportation

MAJCOM	Largest Base by Spend	Total Spent on Construction
ACC	Nellis	$50M
AETC	Little Rock	$48M
AMC	Travis	$70M
AFSPC	Patrick	$84M
PACAF	Hickam	$121M
USAFE	Ramstein	$91M
AFRC	Westover	$19M
DRU/FOA	Air Force Academy	$121M
AFMC	Brooks	$151M

Table 21. 23XXXX Construction

NAICS CODE	Total
541710 Research and Development in the Physical, Engineering, and Life Sciences	19,403
541330 Engineering Services	12,559
336413 Other Aircraft Parts and Auxiliary Equipment Manufacturing	12,235
233320 Nonresidential Building Construction	5,996
336412 Aircraft Engine and Engine Parts Manufacturing	5,618
541519 Other Computer-Related Services	4,810
334111 Electronic Computer Manufacturing	4,478
336411 Aircraft Manufacturing	3,807
561210 Facilities Support Services	3,788
334511 Search, Detection, Aeronautical, and Nautical System and Instrument Manufacturing	3,777
811212 Computer and Office Machine Repair and Maintenance	2,920
541512 Computer Systems Design Services	2,648
541511 Custom Computer Programming Services	2,466
236220 Commercial and Institutional Building Construction	2,295
541310 Architectural Services	2,285
481211 Nonscheduled Chartered Passenger Air Transportation	2,251
481212 Nonscheduled Chartered Freight Air Transportation	2,108
562910 Remediation Services	2,018
421430 Wholesale Trade	1,815
334220 Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	1,798
334290 Other Communications Equipment Manufacturing	1,724
234110 Construction	1,668
337214 Office Furniture (Except Wood) Manufacturing	1,514
811213 Communication Equipment Repair and Maintenance	1,409
811219 Other Electronic and Precision Equipment Repair and Maintenance	1,373
Grand Total	**106,763**

Table 22. Top 25 NAICS by Number of Actions

Base – Office	Total
Tyndall – 325 CONS	480
Wright-Patterson – ASC/PKWO	317
MacDill – 6 CONS	282
Vance – 71 FTW/CVC	257
Elmendorf – 3 CONS	155
APO AE Copenhagen – DET 1, 21 CONS	153
Warner Robins – ALC/PKO	128
Grand Total	**1,772**

Table 23. 561210 Facilities Support Services

Base – Office	Total
Randolph – HQ AETC	261
Tyndall – 325 CONS	140
Oklahoma City—OC-ALC/PKO	139
Malstrom – 341 CONS	127
Eglin – AAC/PKO	93
Brooks – HSW/PKO	92
Peterson – 21 CONS	86
Grand Total	**938**

Table 24. 541310 A&E Services

Base – Office	Total
Scott – HQ AMC/DOY	2,242
Randolph – 12 CONS	7
Langley – HQ ACC	2
Grand Total	**2,251**

Table 25. 481211 Nonscheduled Chartered Passenger Air Transportation

Base – Office	Total
Scott – HQ AMC/DOY	2,099
Wright-Patterson – ASC/PKWO	2
Hulburt Field – 16 CONS	2
Lackland – 37 CONS	2
Peterson – 21 CONS	1
Ramstein – HQ USAFE	1
Eglin – AAC/PKO	1
Grand Total	**2,108**

Table 26. 481212 Nonscheduled Chartered Freight Air Transportation

For this article, we have combined 481211 and 481212. The recommendation of Scott for the air charter commodity council is supported by both dollars and actions—Tables 25 and 26.

From a construction perspective, the MAJCOMs should consider the bases listed in Table 27, as well as those previously ranked by dollars spent. It is our opinion that a construction council should have equal representation where feasible.

Base	Total
Wright-Patterson	408
Randolph	407
Nellis	401
Hill (OO-ALC)	382
Air Force Academy	341
Scott	335
Tyndall	327
Peterson	237
Maxwell	228
Seymour Johnson	183
Vandenburg	156
Grand Total	**3,399**

Table 27. 233320, 236329, and 234110 Construction Aggregate

Interview and E-Mail Results

Discussions with the AFMC Directorate of Contracting revealed they have experienced the most success with spend analyses and establishing commodity councils. Although their efforts do not span the entire Air Force enterprise, AFMC is standing up commodity councils at the three depots. The are currently in the final stages of setting up a landing gear council at OO-ALC, an engine council at OC-ALC, and a support equipment council at WR-ALC.

The Air Armament Center Directorate of Contracting at Eglin has a land mobile radio blanket purchase agreement (BPA). Interestingly, their prices are below those charged by the General Services Administration (GSA), and better yet, customers do not pay the GSA surcharge. Right now, they are allowing customers to issue a military interdepartmental purchase request to transfer the money to Eglin, who, in turn, will obligate funds on the requester's behalf.

AFSPC at Peterson AFB, Colorado, has five BPAs for cell phones. The good news is these BPAs have been used successfully by other DoD organizations.

The AFMC Surgeon General is setting up a central acquisition activity to award and administer professional medical services, facility and maintenance equipment services, and IT support services. The team is made up of ten people, and it is in the initial stages. The team fully expects to leverage $30M in FY04.

Assumptions

- Program offices will retain autonomy for systems and R&D buys, as this analysis is specifically aimed at the operational procurement offices.
- DD350 and DD1057 data contain dirty *data* and are not fully complete because of the numerous ways of coding reports.
- Commodity councils can be established by Air Force base, by MAJCOMs, or by geographic region,

depending on which arrangement is most advantageous and makes the best use of available resources.

- This is a preliminary analysis indicating potential opportunities, which will require further investigation.

Recommendations in Summary

These recommendations were presented at the 2003 Worldwide Contracting Training Conference on 21 October 2003.

Establish the following commodity councils:

- Systems Engineering Services (OC-ALC Aircraft Contracting). OC-ALC/LAD spent $550M of the $2.5B Air Force total. The leverage potential is $2B.
- Other ADP and Telecommunications Services (Materiel Systems Group Contracting Office). The Materiel Systems Group Contracting Office spent $400M of the $1.4B Air Force total. The leverage potential is $1B.
- Base Operations Support Services and Facilities Support Services (Tyndall 325 CONS). Tyndall spent $500M of the $1B Air Force total. The leverage potential is $500M. If this FSC and the NAICS were broken out by command, Incirlik AB, Turkey ($110M spend) could be the United States Air Forces in Europe lead, and Hickam AFB, Hawaii, ($100M) could be the PACAF lead.

This council also could be consolidated geographically:

- Florida—$1.5B total spend ($590M—Tyndall)
- Texas—$295M total spend ($170M—Randolph)
- Colorado—$160M total spend ($55M—Peterson)
- California—$155M total spend ($90M—Vandenberg)
- Georgia—$110M total spend ($31M—Robins)
- Food Services (Commodity Council by MAJCOM)

Sheppard AFB, Texas, could leverage $87M for AETC. Travis AFB, California, could leverage $20M for AMC, and Vandenberg AFB could leverage $13M for AFSPC.

- Office Furniture (OO-ALC Operational Contracting Division). OO-ALC spent $35M. Ramstein AB, Germany; Vandenberg AFB; Lackland AFB, Texas; Scott AFB, and the Air Force Academy also had large buys.
- Utilities and Electric Services $535M (by command or geographic area). Largest Users: PACAF (Yokota), AFSPC (Vandenberg), AFMC (Arnold), AETC (Goodfellow), and ACC (Offutt AFB, Nebraska).
- Environmental. $730M of $814M total is spent by Brooks AFB. Brooks contracting personnel also have expressed interest in heading up a commodity council.
- Industrial Trucks, Tractors, and Trailers (WR-ALC). Warner Robins spent $300M of the $319M total.
- Construction. MAJCOM, DRU, and FOA representation by both dollars and number of actions is recommended.

Final Recommendations

- Convert the Excel data file and associated pivot tables generated during this effort into Web-based programs. We feel that field offices should be able to use the data to conduct their own spend analyses to leverage their current spend until enterprise councils are established.
- Standardize the FSC and NAICS entry into one numbering system as this information is redundant on the DD350 entry form. As such, either could be used for spend analysis purposes.
- SAF Contracting discourage the use of 9999 or 99990 (miscellaneous entries) and address the importance of properly coding the DD350 or DD1057 so that FSC or NAICS data can be captured.
- Conduct a follow-on study that captures the lessons learned from previous commodity councils. This effort will provide the enterprise architecture for procurement or roadmap for others to follow.

Knowledge is power!

—Francis Bacon

Turbulence is life force. It is opportunity. Let's love turbulence and use it for change.

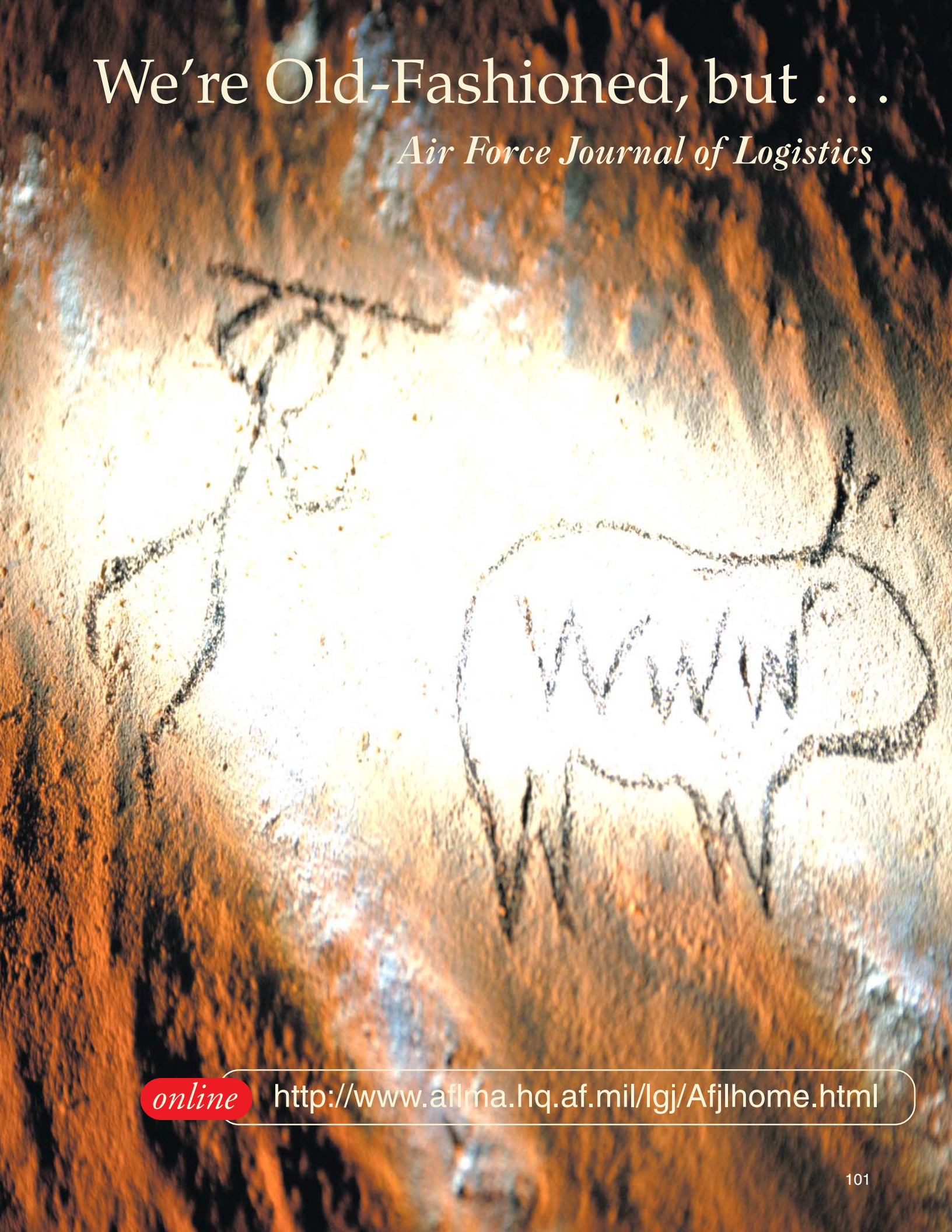
—Ramsay Clark

Forget logistics, you lose.

—Lieutenant General Fredrick Franks, USA

Creativity can solve almost any problem. The creative act, the defeat of habit by originality, overcomes everything.

—George Lois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Buyer Beware

Look Before You Leap into a Contract

The implementation of the GPC program has changed the way many organizations procure goods and services priced less than $2,500.

Lieutenant Colonel Kim C. Triesler, CPCM

How often have we heard that phrase, but don't we generally assume that to be a reference to look into the pond or pool before you take a *header*? In this instance, however, I am referring to the fact that people in our profession need to pay close attention to the financial viability of any contractor who submits a proposal or offer in response to a government request. By and large, most contractors are in reasonably good shape financially. However, there are some contractors who will *bet the farm* on getting a contract from the Government in the hope of shoring up a failing business.

Unfortunately, if a contract is issued to a financially *shaky* firm, there is always the possibility of problems arising shortly after the contract is issued as the contractor struggles to make ends meet, especially with a government contract where it can be somewhat difficult at times for the contractor to get paid. And if problems do arise and the contractor reneges on the contract, either the contracting officer or the contract administrator will have to take the time to try to locate another suitable contractor to complete the portion of the contract that the original contractor could not handle.

Of course, this creates even more problems for the Government. First of all, a cure or show-cause notice must be submitted to the vendor seeking reasons for the delays in delivering products or services. Should the contractor default on the contract, then the contracting officer must set time aside to find another suitable vendor to complete the terms of the contract. This has the potential of delaying the delivery of the services or products the customer needs, along with potentially impeding the issuance of other contracts or modifications for other customers who have been waiting patiently for their requests to be fulfilled.

And how might a good contracting officer avoid this in the first place? Are we offering up the services of some mystical lady who possesses psychic abilities or has the proverbial crystal ball ready for immediate use to foresee the future? Hardly.

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In fact, here is a bit of background material that we took into consideration at the time we were tasked to tackle the *Financial Analysis Tools Reference Guide* project. First of all, the shift in emphasis in Air Force contracting, from sealed bidding to negotiated procurements, increased the requirement for contracting officers to understand the financial makeup and condition of the firms that were competing for Air Force contract awards. Contracting officers must know where they can get financial data and information on these firms and how to analyze it to determine their financial health. However, as we conducted our analyses, a distinction had to be made between publicly traded firms that provide financial information in accordance with government procedures and industry standards (to include Securities and Exchange procedures) and private firms that do not disclose such information to the general public. This distinction highlighted the need for contracting officers to explore avenues other than those found strictly in the public domain when evaluating the financial health of private firms. Key government agencies, to include the Defense Contract Audit Agency and Internal Revenue Service, can provide contracting officers with additional information needed to make financial analysis decisions, and their potential benefit should be known by the contracting officers.

Furthermore, it is important for contracting officers to understand how commercial firms evaluate each other when engaging in business transactions independent of the Government, particularly when financing is involved. Finally, in addition to a strict quantitative analysis of available data and an understanding of commercial practices, contracting officers should understand that other resources are available to help them recognize potential financial problems, which includes past performance evaluations.

We found and described a wealth of sources in our guide that any contracting officer or contract administrator can turn to in order to ascertain the financial health of any company. In particular, for starters, there is a wide range of ratios that anyone can use to determine a company's financial well-being. What we found particularly amazing was the Altman Z-test, which is a failure-prediction model. We found it very useful in that it provides an initial alert of financial problems. While there are many other resources available, as in every given situation, there is no definite cookie-cutter approach to determining the financial health of contractors interested in winning government contracts.

You might already have come to the conclusion by now, or even before you read this article, that you do not have to believe all contractors are created equal. Some are, in fact, not only less capable than others but also not as financially stable as the contracting officers need them to be to provide a high degree of confidence in their ability to survive and complete their end of the contractual agreement. Hence our title of this article, which many have learned from the *school of hard knocks* in their own personal business affairs. Buyer beware—look before you leap!

In September 2003, the AFLMA participated in the Logistics Officer Association's (LOA) 21st Anniversary Conference. The Association, comprised of more than 2,000 military officers and civilians in logistics fields around the globe, exists to enhance the military logistics profession and promote quality logistical support and logistics officer professional development. The conference provided an ideal forum to exchange a wide variety of logistics knowledge and demonstrate innovative technologies valuable to logisticians at all levels. The AFLMA exhibit was one of more than 60 that showcased new technology and initiatives. At the conference, we featured several of our newest monographs: *Combat Support: Shaping Logistics for the 21st Century, Logistics and Warfighting: Thinking About Agile Combat Support*, and *Logistics Dimensions 2003: Strategy, Issues, and Analysis,* as well as several of our most requested products: *The Logistics of Waging War, Maintenance Metrics US Air Force, and Vehicle Maintenance Safety: A Guide for the Air Force Vehicle Maintainer*. The publications were well-received, and there were many requests for other AFLMA products such as the *Contingency Contracting Handbook*. The conference afforded AFLMA the opportunity to publicize the process that allows any Air Force logistician to submit potential study topics to the respective MAJCOM Director of Logistics. Further, the conference presented the perfect environment to *get the word out* to the Air Force logistics community about how studies and analyses impact logistics operations for warfighters throughout the Air Force.

Logistics Officer Association

CONTRACT

Contract Payment Guide

Major Michael E. Knipper

Today, the partnership between the Air Force and corporate America is so vital we would not accomplish our many missions without it. Each has responsibilities to the other. One of the Air Force's is to promptly pay for the goods or services contractors provide.

Many times, however, the Air Force is delinquent in meeting its end of the bargain. In fact, the service is paying excessive amounts in interest penalty payments to contractors and vendors. Interest penalties are the result of not paying contractors within 30 days of receipt of a properly executed invoice, which the Prompt Payment Act mandates. In fiscal year (FY) 2002, the Air Force paid nearly $9.5M in interest and paid nearly $4.5M in interest through April FY03. During the same period, contractors and vendors offered $4.3M in prompt payment discounts, and the Air Force took advantage of only 57 percent of them.

Late payments to contractors have prompted complaints at many bases. In some cases, discontented vendors have ceased doing business with the Air Force, which can impact mission accomplishment. This resulted in the Deputy Assistant Secretary for Contracting, Office of the Secretary of the Air Force for Acquisition charging AFLMA to develop a guide to help the Air Force make more timely contract payments.

The objective of the study was not to examine the payment process and develop recommendations to fix it but to develop a guide that addresses the late payment problem and the reasons for it. The guide also will explain the processes already in place for making timely payments.

The problem is that the four parties involved in the payment process—contracting offices; their customers; the Defense Finance and Accounting Service (DFAS); and in some instances, the contractors themselves—all play a part in the payment process. Contracting must write complete and coherent contracts that explain to vendors where and when to submit invoices, at the same time delineating to DFAS the line items and their value and the funding (or *color of money*). Customers, in turn, must complete a receiving report when the goods or services are received. Contractors must include all the proper elements in their invoice and deliver the invoice to the correct paying office, and finally, DFAS must ensure all these essentials are in place in order to make payment. Each of the parties can impact the payment process negatively.

To remedy the interest penalty payment trend, the guide looks at two distinct types of payment methods: contract pay and vendor pay. Contract pay involves major acquisitions—complex, large dollar, multiyear, often multifunded purchases—consisting of weapon systems and contracts normally administered by the Defense Contract Management Agency. DFAS Columbus makes these payments. Vendor pay typically supports routine, day-to-day operations and is paid primarily with operations and maintenance funds. Local contracting squadrons administer these contracts, and payments are made by 1 of 25 DFAS locations. Vendor pay involves high volume and uses relatively simple payment terms, whereas contract pay is more complex, with detailed payment instructions.

Lessons Learned from Operation Enduring Freedom

CCO Handbook

Contracting support of deployments takes place in four phases—initial deployment, buildup, sustainment, and termination or redeployment—and this guide is somewhat organized according to those phases. Much of the discussion is aimed at initial deployment to a bare-base environment because this is where CCOs need the most guidance. It is an environment most CCOs are simply not used to. The guide also discusses peacetime contracting support during emergency situations and touches on some important funding issues.

Master Sergeant James Roloff

This latest effort differed greatly from previous ones, in both form and content. Contracting superintendents from the major commands provided AFLMA valuable insight into what the field really needed and wanted. No longer did the on-the-go contingency contracting officer (CCO) want a 200-plus-page book explaining the importance of deliberate planning and what a designed operational capabilities statement is. CCOs did not care about time-phased force deployment data or the Status of Resources and Training System. They wanted a compact guide that would tell them what is important to get the job done. So AFLMA delivered an 80-page, full color handbook—essentially, a thinner version of the *Airman's Manual*—which included the experience and insight of CCOs who participated in Operation Enduring Freedom.

While writing the book, AFLMA made the assumption that, prior to deploying, CCOs would be adequately trained in their responsibilities through the formal training course, CON 234 Contingency Contracting, or their unit's local training. However, because no one can remember verbatim all his or her training, the guide should help. AFLMA recommended that the book be used in conjunction with other references as well.

The book explains that deployment is an environment where people and procedures change and CCOs had better adapt. There are few attributes more important for a CCO than resourcefulness, flexibility, and the ability to improvise. This can be true of anyone in a deployment, regardless of position or responsibility. However, CCOs, because of the wide range of responsibilities falling on their shoulders, are, in many, instances forced to take on extraneous duties that can cut into their valuable time. To help remedy this, the guide advises CCOs to balance mission priorities with other

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assigned duties or tasks by advising leadership of the ramifications or effects of doing certain things before others.

Being successful in the field also means being proactive—seeking out their requirements. The job of CCOs will not get done sitting in an office and letting customers come to them. They should find the people in the know—commanders, branch chiefs, and superintendents. They should attend meetings even if contracting issues are not discussed, because meetings are held to coordinate issues or solve problems. Since CCOs are trained to find commercial means to solve problems, there is value added in attending such meetings. They provide an opportunity to listen for customer needs, offer solutions, and advise of potential or actual problems with proposed acquisitions or existing contracts. This is also a good forum in which to network, establish good working relationships, and get help when the need arises.

Contracting support of deployments takes place in four phases—initial deployment, buildup, sustainment, and termination or redeployment—and the book is somewhat organized according to those phases. Much of the discussion is aimed at initial deployment to a bare-base environment because this is where CCOs need the most guidance. It is an environment most CCOs simply are not used to. The guide also discusses peacetime contracting support during emergency situations and touches on some important funding issues.

Logistics…embraces not merely the traditional functions of supply and transportation in the field, but also war finance, ship construction, munitions manufacture, and other aspects of war economy.

—Lieutenant Colonel George C. Thorpe, USMC

Logistics comprises the means and arrangements which work out the plans of strategy and tactics. Strategy decides where to act, logistics brings the troops to that point.

—General Antoine Henri Jomini

The engineer is the key figure in the material progress of the world. It is his engineering that makes a reality of the potential value of science by translating scientific knowledge into tools, resources, energy and labor to bring them into the service of man…. To make contributions of this kind, the engineer requires the imagination to visualize the needs of society and to appreciate what is possible as well as the technological and broad social age understanding to bring his vision to reality.

—Sir Eric Ashby

I am tempted to make a slightly exaggerated statement: that logistics is all of warmaking, except shooting the guns, releasing the bombs, and firing the torpedoes.

—Admiral Lynde D. McCormick, USN

An expert is a person who has made all the mistakes that can be made in a very narrow field.

—Niels Bohr

Only a commander who understand logistics can push the military machine to the limits without risking total breakdown.

-—Major General Julian Thompson, Royal Marines

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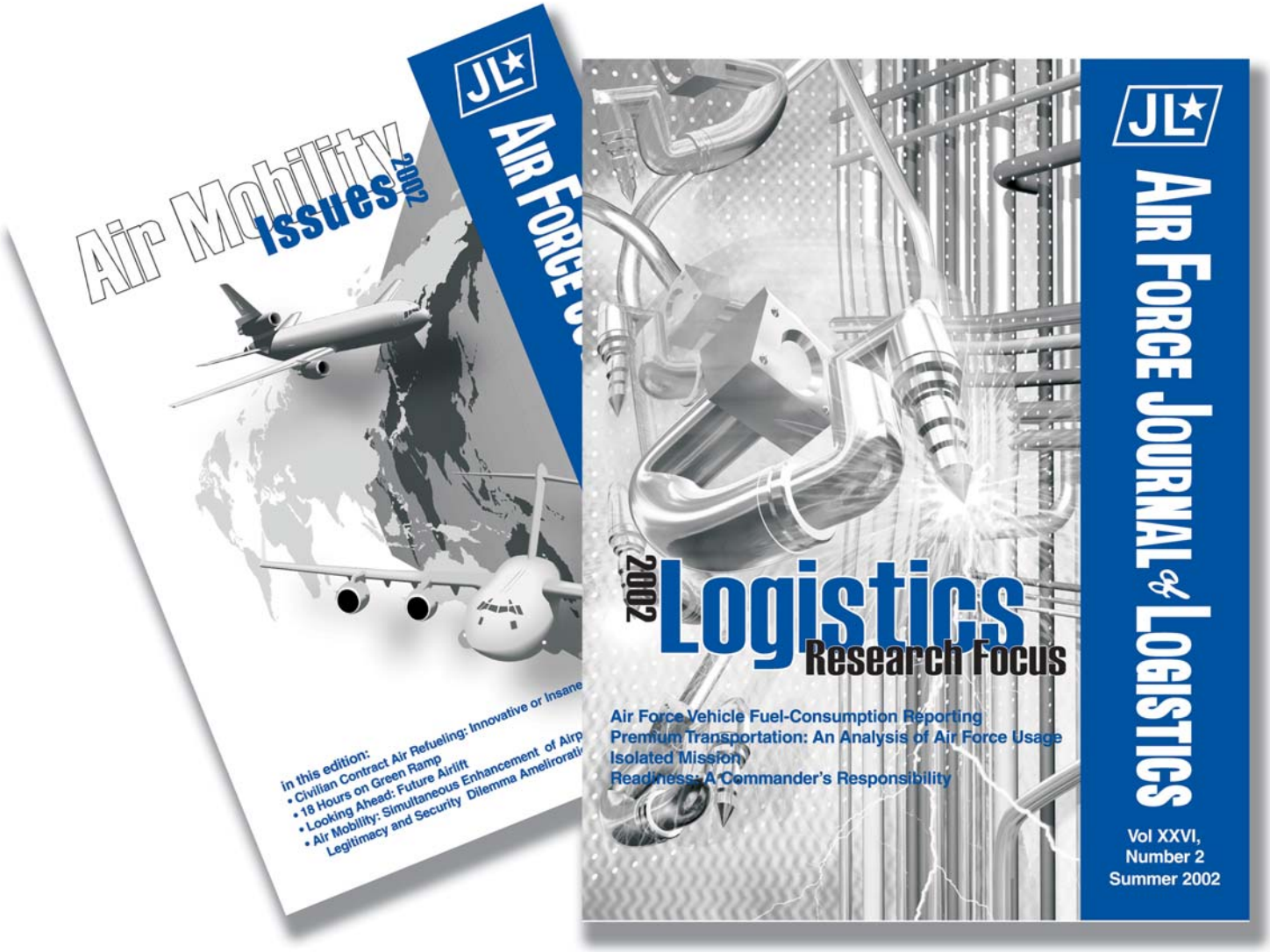

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We've published and distributed a cumulative index for both *The Pipeline* and the *Journal*, available in hard copy and electronic versions. An update to the index will be published in early 2004.

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Air Force Journal of Logistics
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Third Edition
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James C. Rainey
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new journal special editions

In 1996, shortly after Operation Desert Strike, concern about the long-term requirements of enforcing the no-fly zones, including covering the carrier gap, led to the initial concept of an air and space expeditionary force. At that time, the Deputy Chief of Staff (DCS), Operations, Lieutenant General John P. Jumper, realized that transforming the Air Force to a more expeditionary footing was going to require comprehensive analytic study. The unique capabilities of both RAND Project Air Force and the Air Force Logistics Management Agency were harnessed to take on this task. From the outset and continuing through today, this work has been jointly sponsored by the DCS, Operations and DCS, Installations and Logistics. *Combat Support*: *Shaping Air Force Logistics for the 21st Century* and Volume 27, No 2 of the *Air Force Journal of Logistics* summarize the work performed over the last 6 years. The focus of *Combat Support: Shaping Air Force Logistics for the 21st Century* is on all the work performed, while Volume 27, No 2 of the *Air Force Journal of Logistics* looks specifically at combat support command and control.

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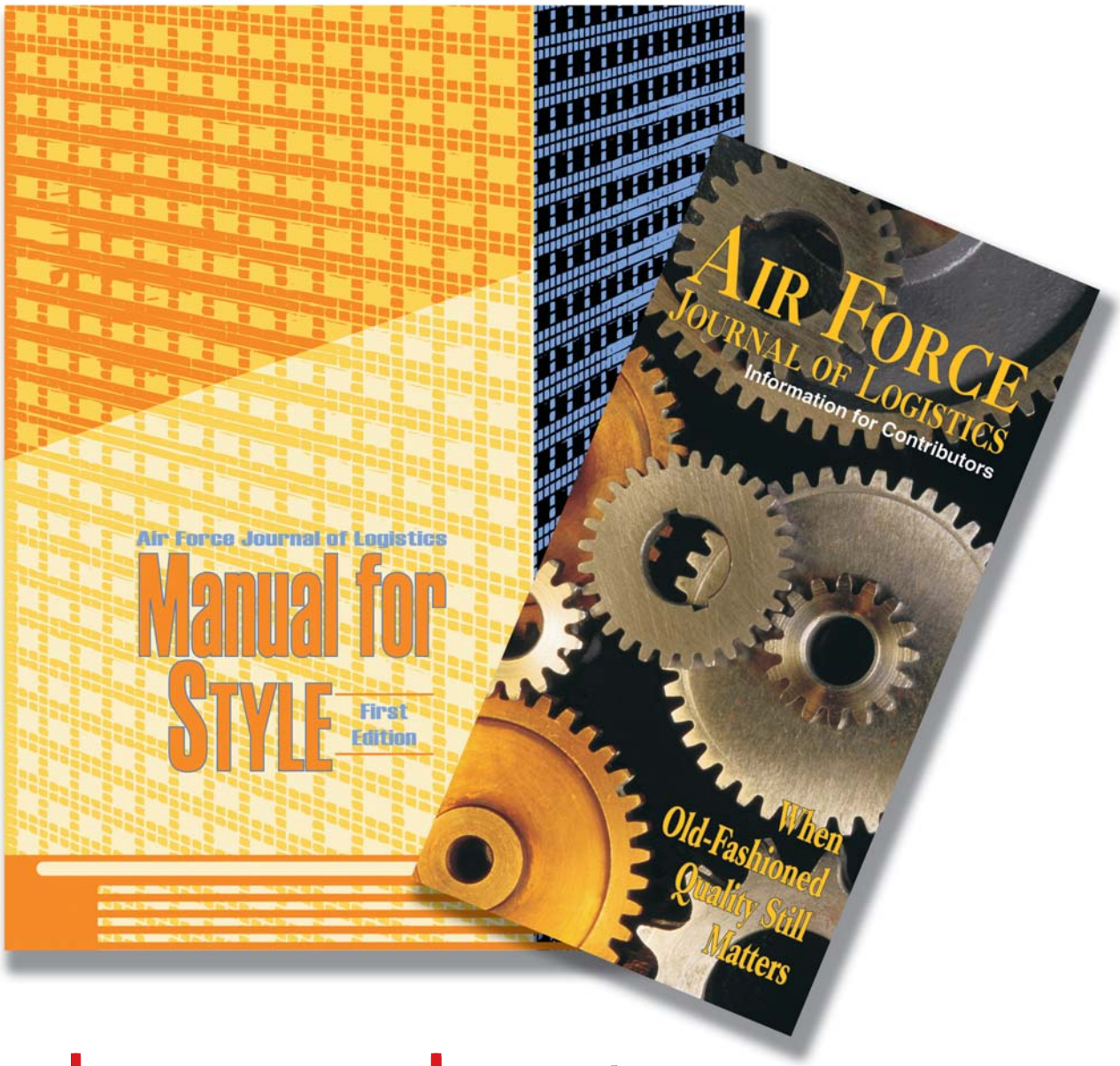

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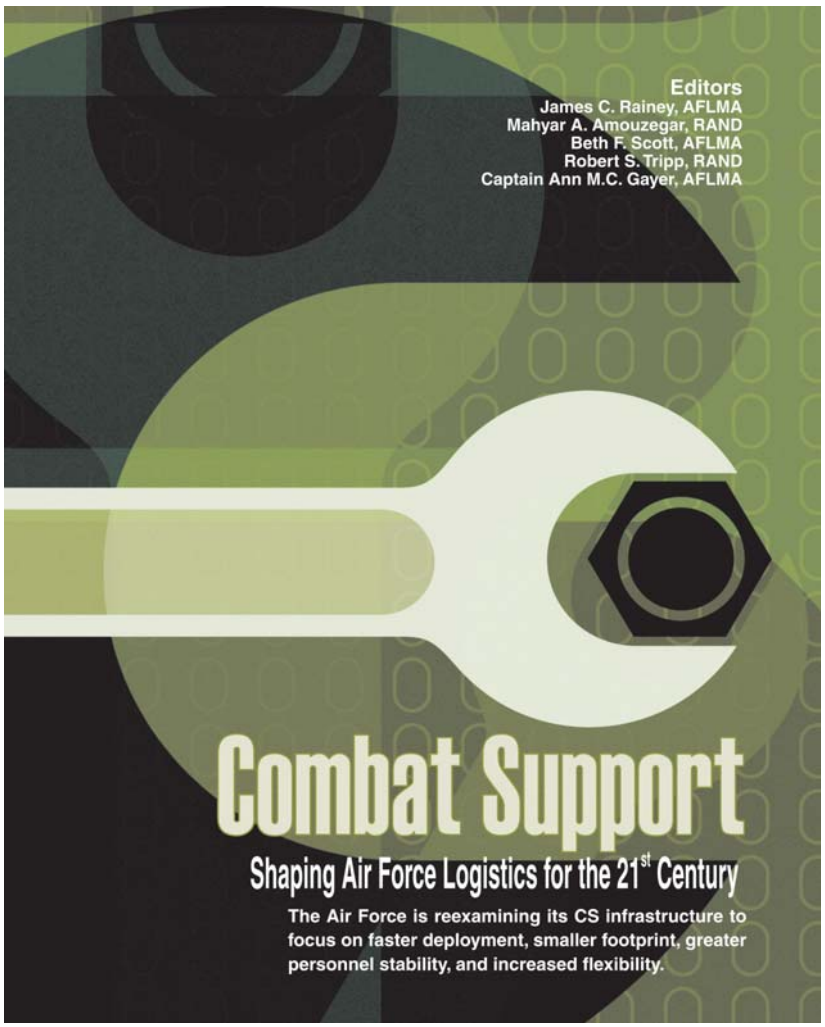
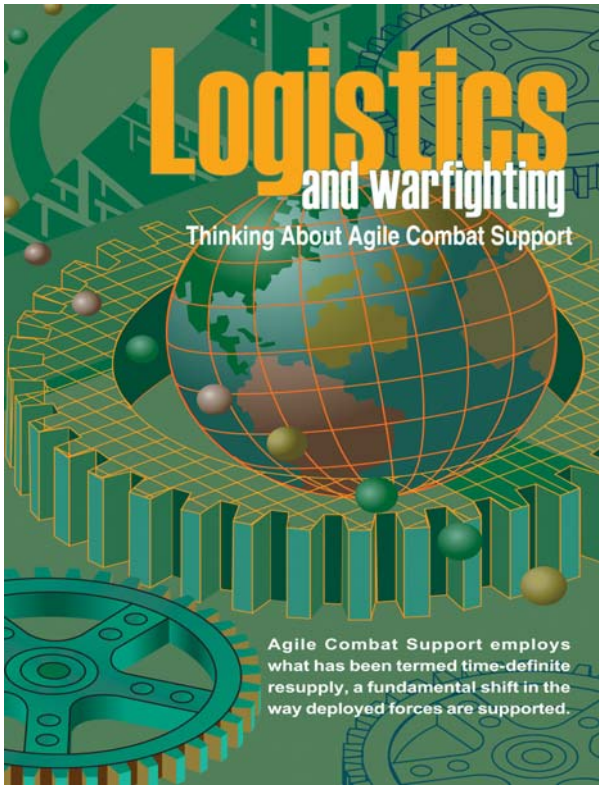


combat support

This publication communicates the essentials of the combat-support analyses completed by RAND and the Air Force Logistics Management Agency over the last 6 years. The research was conducted to help the Air Force configure the Agile Combat Support system in order to meet expeditionary airpower goals. These articles also illustrate how analysis can, when properly accomplished, influence Air Force policy making. Additionally, the book can be used as a teaching document, illustrating the complexity of Air Force logistics systems and processes, as well as an archive of analytic methodology applied to military policy analysis. As a whole, the book can serve as a history of logistics during this 6-year period of extensive change, detailing where the Air Force has come from and why. Further, an examination of the entire collection can serve as an example of how to manage complex change and how to study large complex issues.

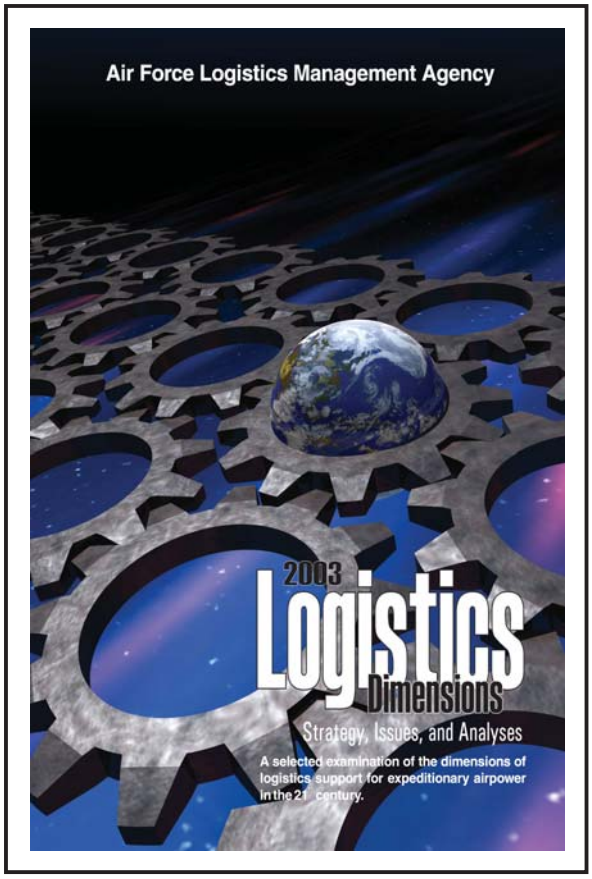


logistics and warfighting

This small book is a collection of essays, articles, and studies that lets the reader look broadly at many of the issues associated with Agile Combat Support. The content was selected to both represent the diversity of the challenges faced and stimulate discussion about these challenges. Also included is a short history of transporting munitions.

2003 logistics dimensions

Logistics Dimensions 2003 is a collection of seven essays, articles, and studies that lets the reader look broadly at many of the issues associated with the expeditionary air force of the 21st century. While small, *Logistics Dimensions 2003* addresses several of the major issues or challenges facing Air Force logistics. The content was selected to represent the diversity of the challenges faced and stimulate discussion about these challenges.

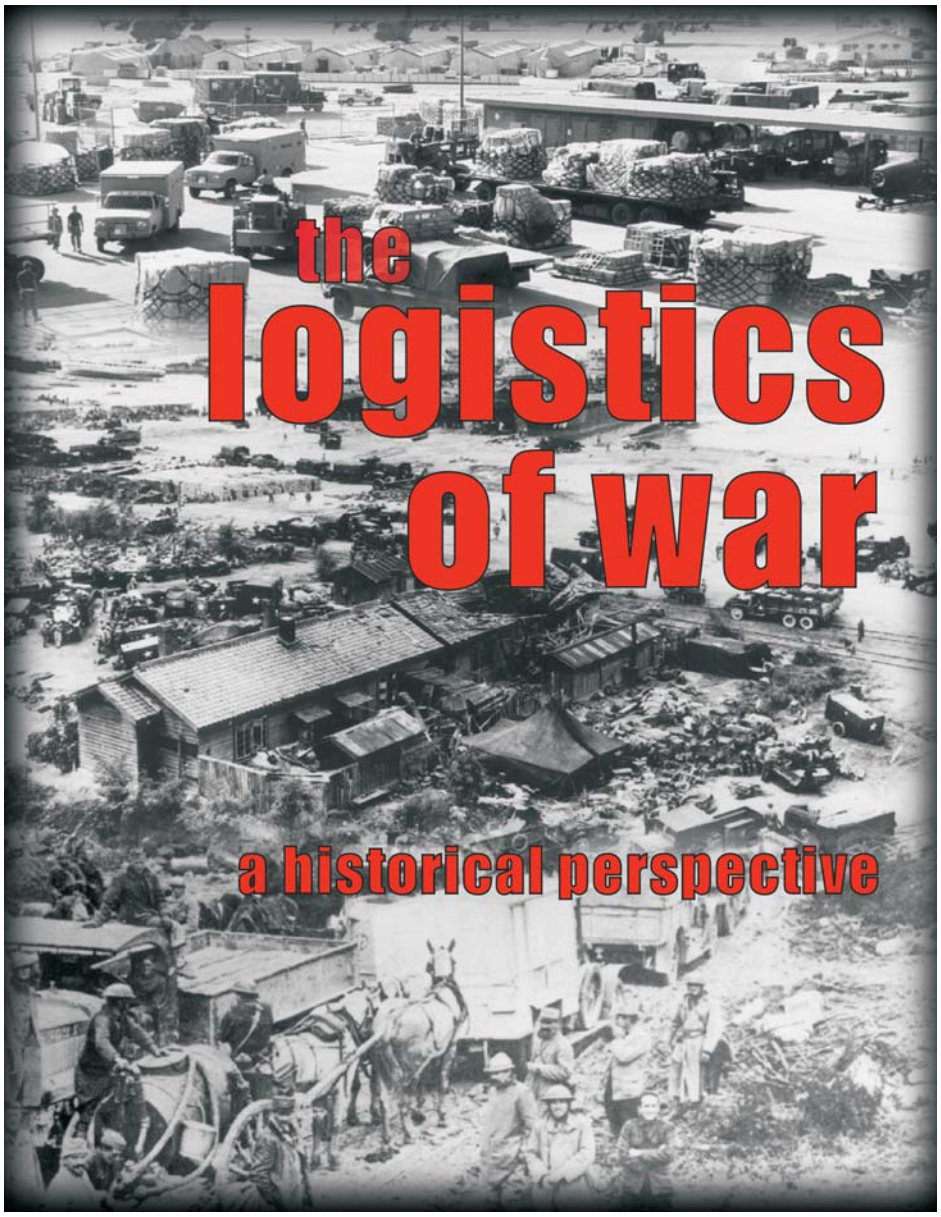


Have you noticed there seems to be a void when it comes to books or monographs that address current Air Force logistics thought, lessons from history, doctrine, and concerns? We did, and we're filling that void. Our staff produces and publishes selections of essays or articles—in monograph format—on a quarterly basis. Each has a theme that's particularly relevant to today's Air Force logistics. Informative, insightful, and in many cases, entertaining, they provide the Air Force logistics community the kind of information long taken for granted in other parts of the Air Force.

Each of our books and monographs is produced in a high-impact format that makes you *want* to pick it up and read it. If you're used to seeing or thinking of monographs as colorless and dry, you'll be more than surprised with these products. The same commitment to old-fashioned quality you've come to know in the *Air Force Journal of Logistics* underpins these finely crafted volumes.

cumulative index

The *Cumulative Index: Air Force Journal of Logistics* was developed to meet the reference and research needs of a broad segment of the logistics community. This edition updates the two previous volumes produced jointly by the AFJL staff and the History Department at Kansas State University. It provides an index of items contained in *The Pipeline* and *Journal* from 1977 to 2002.



the logistics of war

The Logistics of War is a collection of three works that examines both broadly and specifically the history of US military logistics: *The Logistics of Waging War—American Logistics, 1774-1985—Emphasizing the Development of Airpower; The Logistics of Waging War—US Military Logistics 1982-1993—The End of Brute Force Logistics*; and the *History of US Military Logistics: 1935-1985, A Brief Review*. *The Logistics of Waging War—American Logistics, 1774-1985—Emphasizing the Development of Airpower* was originally published by the Air Force Logistics Management Agency as part of Project Warrior. While retaining its original character, this work has been extensively edited and reorganized, and two new sections were added: "The Logistics Constant Throughout the Ages" and "General Logistics Paradigm: A Study of the Logistics of Alexander, Napoleon, Sherman." Readers of the old work will find this new version easy to navigate through and a bit more user friendly. *The Logistics of Waging War—US Military Logistics 1982-1993—The End of Brute Force Logistics*, also originally published by the Air Force Logistics Management Agency, has likewise been extensively edited and updated. The final work is Jerome G. Peppers' seminal work on the history of US military logistics. Call and order your copy today.

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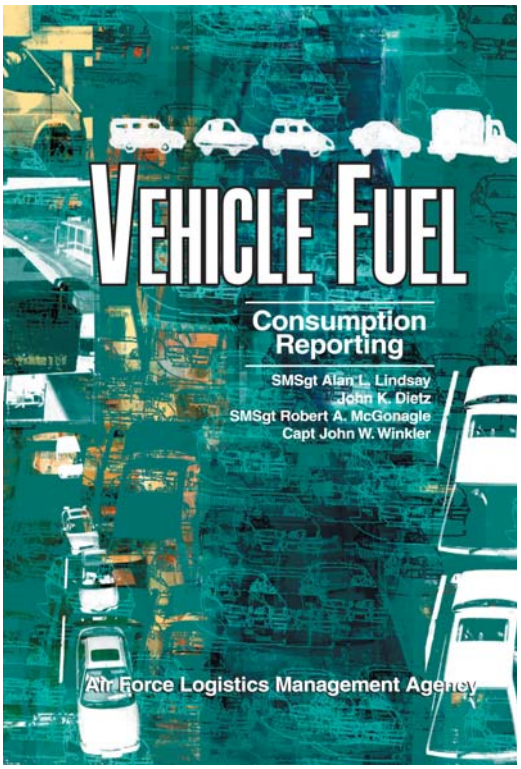
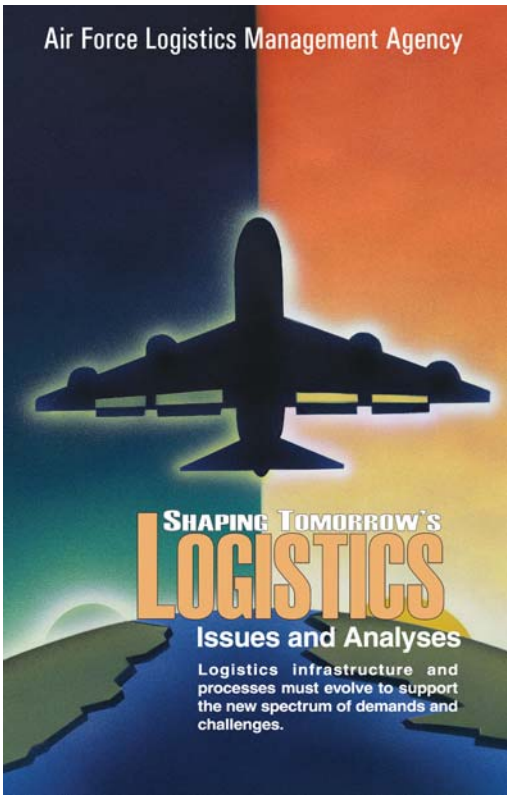


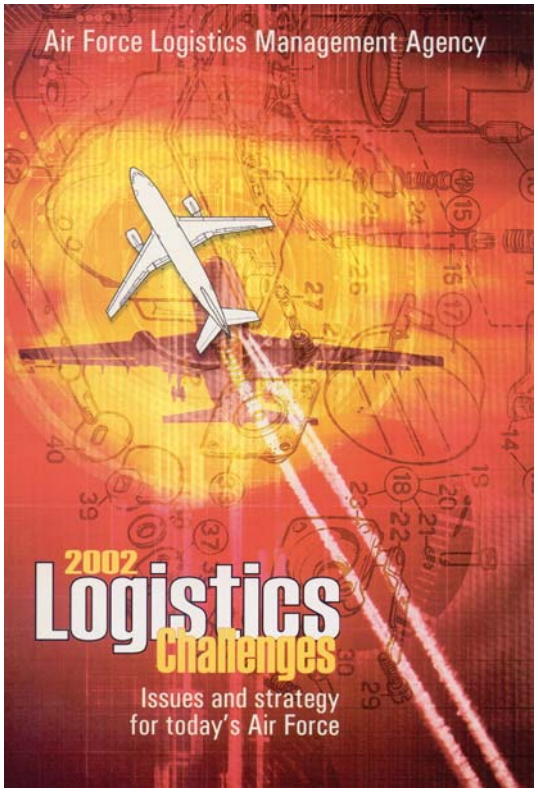
vehicle fuel-consumption reporting

Legislation passed in 1999 mandates that petroleum consumption by government vehicles be reduced 20 percent by 2005. Additionally, alternative fuels must be used the majority of the time in those vehicles designated as bi-, flex-, and dual-fuel. The main objective of the research contained in *Vehicle Fuel-Consumption Reporting* was to ascertain if fuel consumption is captured accurately within the data systems for reporting requirements and decisionmaking. Limited quantities.

shaping tomorrow's logistics

Shaping Tomorrow's Logistics is a collection of 12 essays, articles, and studies that lets the reader examine a variety of research and thought that speaks to shaping and changing tomorrow's Air Force logistics. Included in the volume is the work of many authors with diverse interests and approaches. Much of the research discussed herein was conducted at the Air Force Logistics Management Agency. Limited quantities.



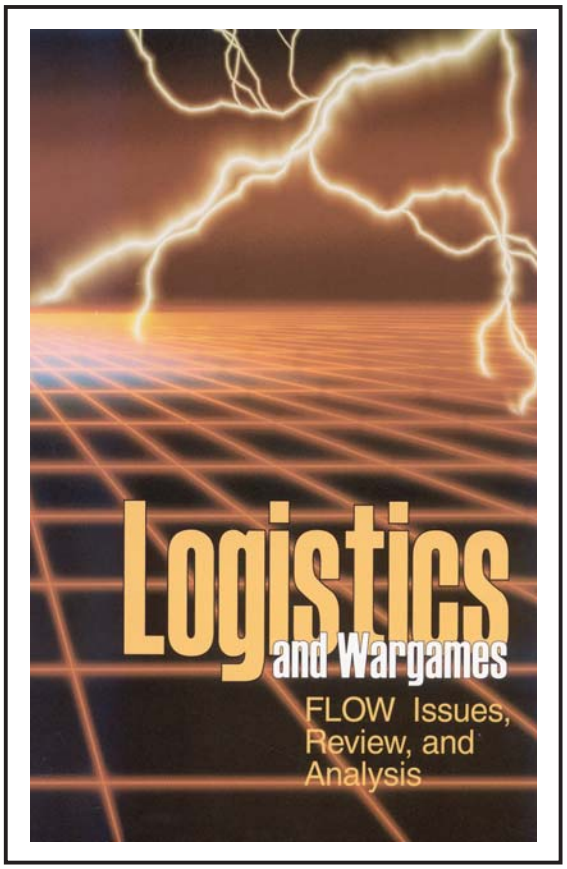


logistics challenges 2002

Logistics Challenges is a collection of nine essays, articles, and studies that lets the reader look broadly at many of the logistics challenges associated with the expeditionary air force of the 21st century. While small, it provides a broad cross section of the challenges. The content was selected for two basic reasons—to represent the diversity of the challenges faced and to stimulate thinking about these challenges. Limited quantities.

logistics and wargames

A key element in today's Air Force is the emergence of the expeditionary airpower. The Air Force's demand that the forces be both a leaner and yet a more lethal force has caused logisticians to explore many different ways to support the warfighters. One of the ways this is being done is through wargames. *Logistics and Wargames* contains a selection of the results of Air Command and Staff College student research conducted during Focused Logistics 2001 (FLOW) and is a collection of seven essays, articles, and studies that lets the reader look both broadly and specifically at selected logistics issues identified during FLOW that are associated with the expeditionary air force of the 21st century. Limited quantities.



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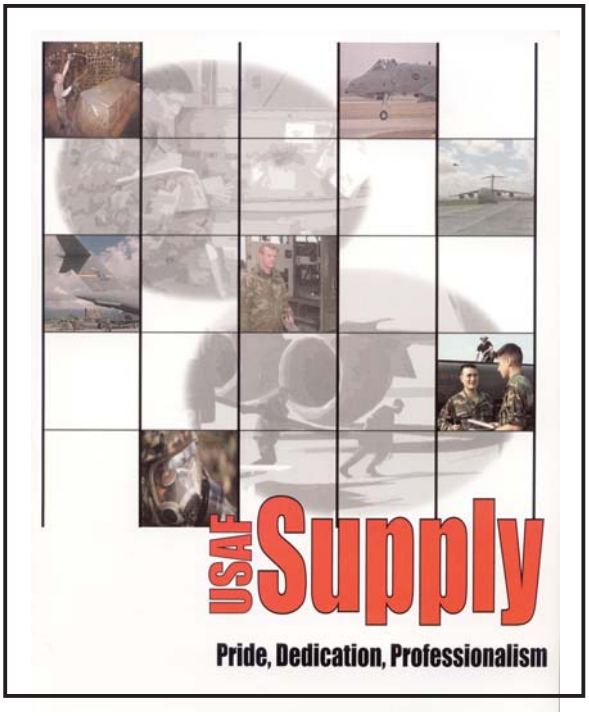
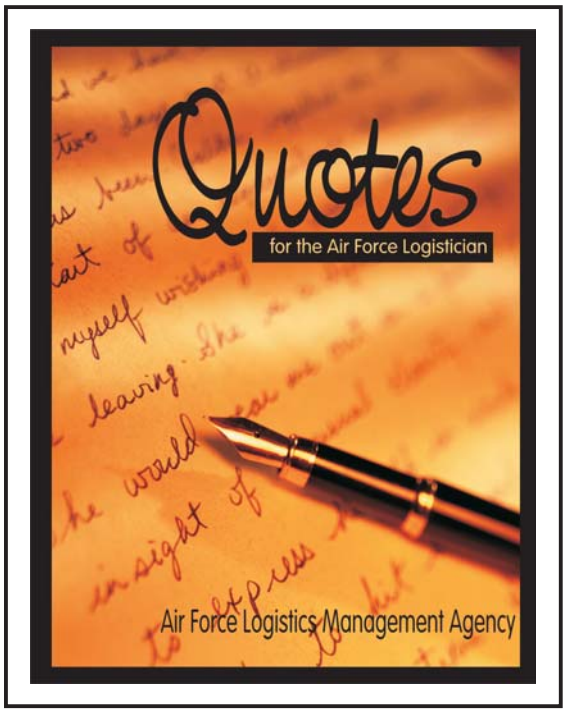


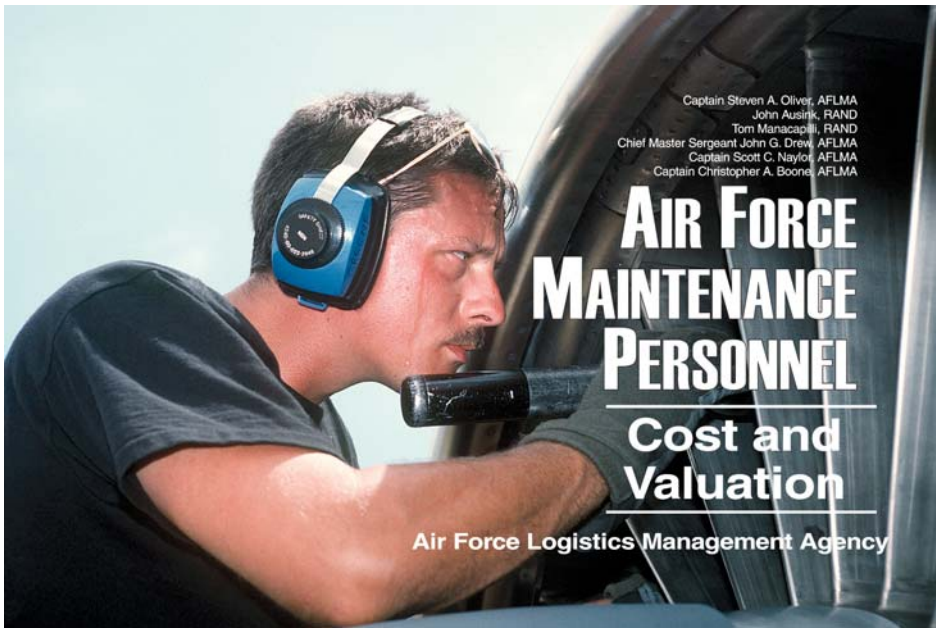
usaf supply

USAF Supply Pride, Dedication, Professionalism highlights the past and future of Air Force supply. As a community, Air Force supply has much to be proud of. They were there when the Berlin Wall came down. They were there when the Cold War ended. And they are there today. As a community, they also have a lot to look forward to. New initiatives, new programs, and new challenges exist that will carry the supply-fuels family well into this century. Limited quantities.

quotes for the Air Force logistician

Quotes for the Air Force Logistician is a teaching resource that can be used in classroom, education, training, and mentoring programs for Air Force logisticians. It is a tool that can be used by instructors, teachers, managers, leaders, and students. It is also a tool that can be used in research settings and a resource that should stimulate comment and criticism within educational and mentoring settings. Copies of the book are provided free of charge to any Air Force logistician, educational institution, teacher, instructor, commander, or manager. Limited quantities.





air force maintenance personnel: cost and valuation

Retention of experienced Air Force maintenance personnel has declined for several years. Attempts to reverse this trend by increasing selective reenlistment bonuses (SRB) for maintenance personnel have met with mixed success. Increased competition for SRB dollars from other functional areas makes it much more difficult for aircraft maintenance functional managers to obtain the increases in SRBs needed to retain critical enlisted maintenance expertise. This competition for funds, coupled with increased scrutiny by Air Force leadership on expenditure of personnel dollars and the benefit those dollars produced, necessitated a new approach in determining and defending SRB recommendations. In March 2001, the Air Force Director of Maintenance tasked AFLMA to provide detailed analyses of selected maintenance AFSCs to support efforts to retain more experienced personnel. The combined efforts of AFLMA and RAND generated a sound proof-of-concept process that met the objectives of the research tasking. These findings are documented in this monograph. Limited quantities.

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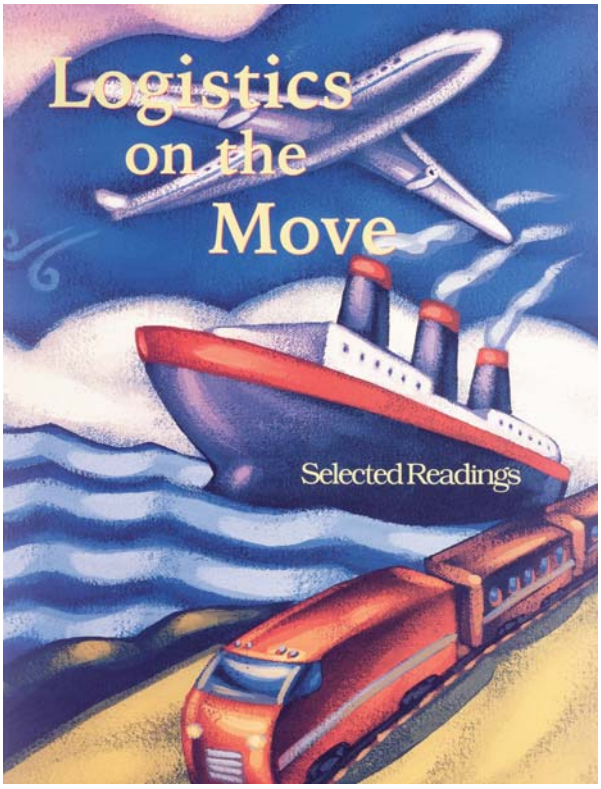
contractors on the battlefield

Contractors on the Battlefield is a collection of seven articles and essays that lets the reader look broadly at many of the initiatives involved with and the issues surrounding the increasing role of contractor support for the US military. It is by no means all encompassing. The very nature of the subject prevents this. These works were selected primarily to stimulate interest, thought, and action. In today's military environment, this thought-provoking monograph is a *must read*.

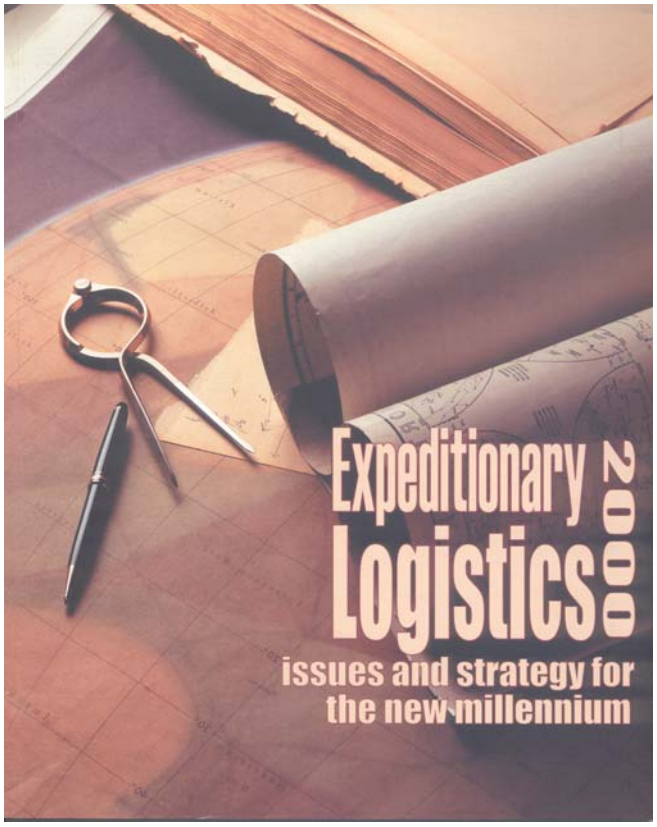


logistics on the move

Logistics on the Move is a collection of essays and articles that looks broadly at five areas of significant interest to logisticians—logistics thought, competitive sourcing and privatization, lessons from history, international logistics, and technology.

expeditionary logistics 2000

The force being molded today differs drastically from its predecessors. Rather than being reactive, airpower must now be proactive to meet the needs of a rapidly changing world. Today's definition of expeditionary airpower means a rapid response force that is light, lean, and tailored to mission needs. What are the challenges, opportunities, and initiatives that need examination? And perhaps more important, how do existing logistics concepts and principles need to change to support expeditionary airpower. *Expeditionary Logistics 2000: Issues and Strategy for the New Millennium* examines a number of these questions through a collection of selected readings.



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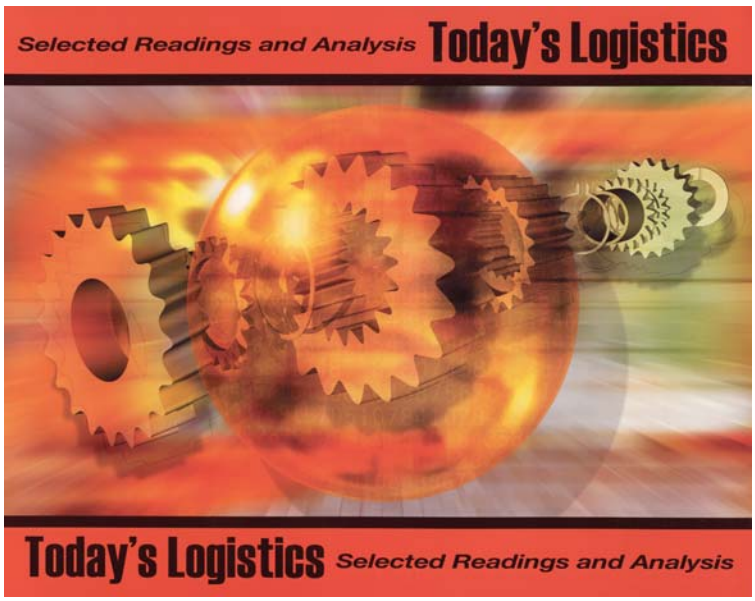
Two of our most popular handbooks or guidebooks—*Maintenance Metrics U.S. Air Force* and the *AEF Fuels Management Pocket Guide*—are also available in electronic format. As with our other books or monographs, they may be downloaded from the AFJL WWW site (http://www.aflma.hq.af.mil/lgj/Afjlhome.html) in portable document format and can be viewed online or downloaded.

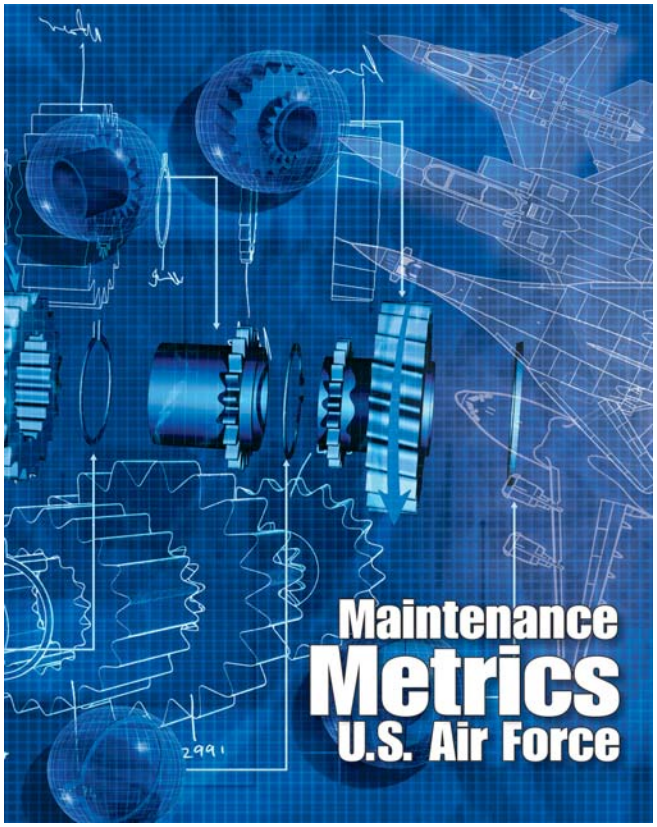


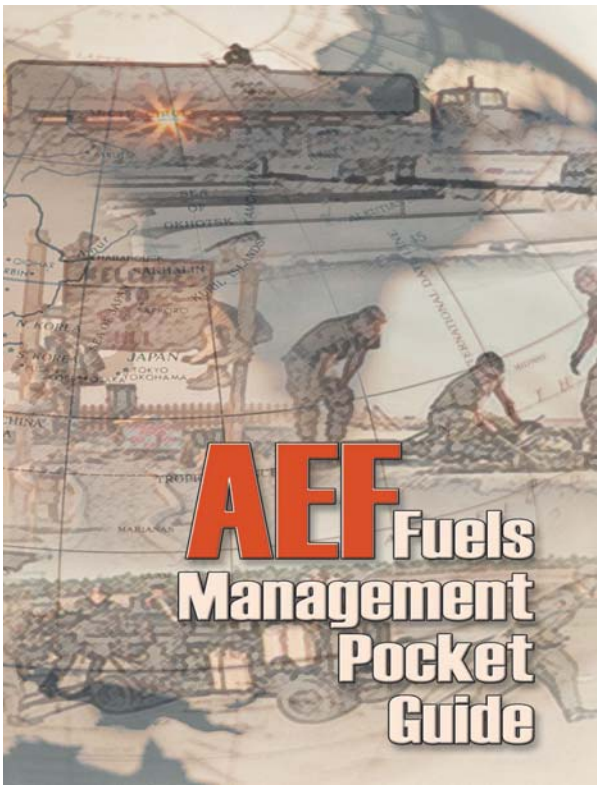
today's logistics

Today's Logistics is a collection of essays, articles, and studies that are very much about change, innovation, and finding ways to improve processes and products. The majority of the writings deal with improving specific facets of Air Force logistics: supply, transportation, maintenance, contracting, and prepositioning. However, other works have been included that focus on logistics thought, theory, crime, and history. Much of the material is based on work performed by the staff at the Air Force Logistics Management Agency.

maintenance metrics

The *Maintenance Metrics Handbook* provides maintenance leaders, at both the wing and major command level, a comprehensive guide to the key metrics associated with aircraft maintenance management. It also touches on key maintenance management issues and includes a brief description of things to consider when analyzing fleet statistics, as well as an explanation of data that can be used to perform analysis.



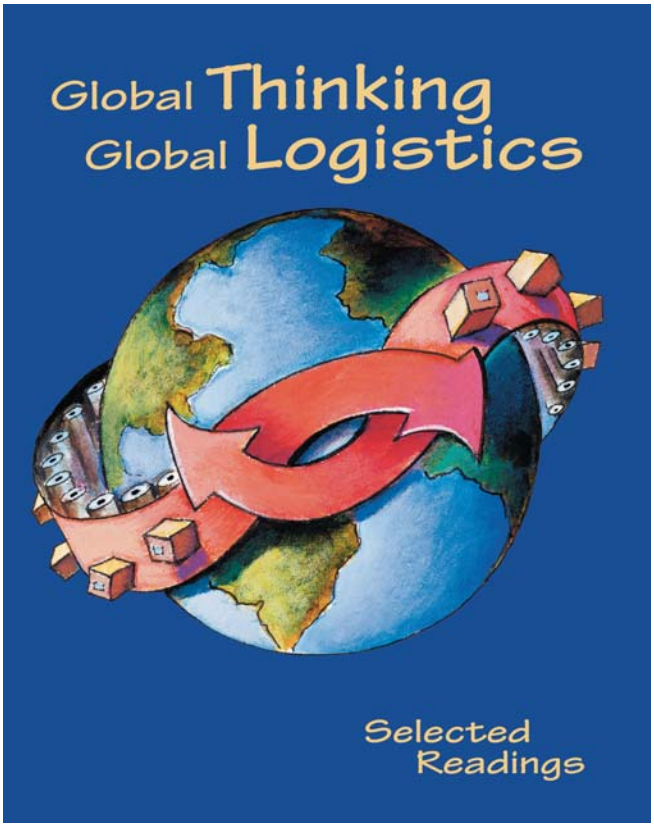


aef fuels management pocket guide

The *AEF Fuels Management Pocket Guide* is designed to assist in understanding fuels issues as they relate to expeditionary airpower operations. The information is intended to provide a broad overview of many issues and be useful to anyone who has an interest in the Air Force fuels business. Update planned. Available in 2004.

global thinking, global logistics

Global Thinking, Global Logistics is a collection of articles and essays by many authors with diverse interests and approaches. However, it contains four distinct areas of interest or issues that face the military as we enter the 21st century: competitive sourcing and privatization, logistics support, logistics history and doctrine, and current challenges. The content was selected for two reasons: to represent the diversity of global logistics issues facing the military of the next century and stimulate thinking about these issues.



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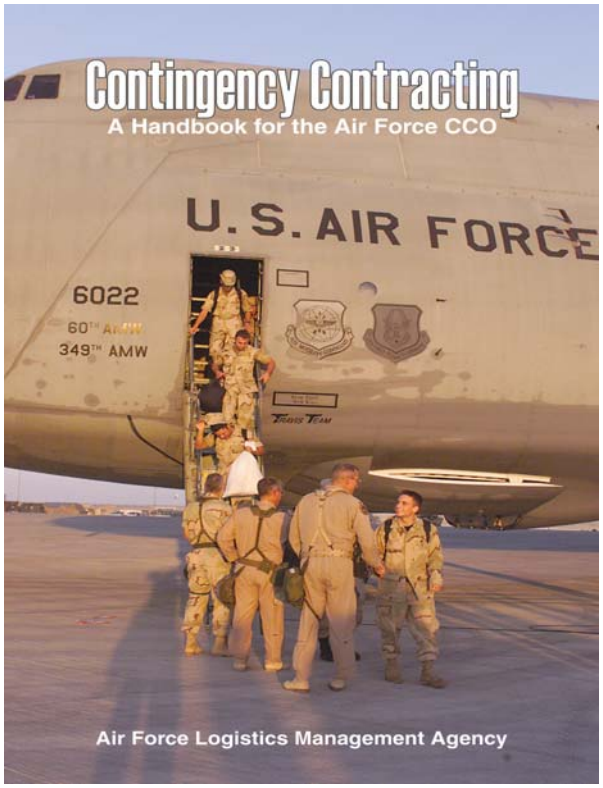
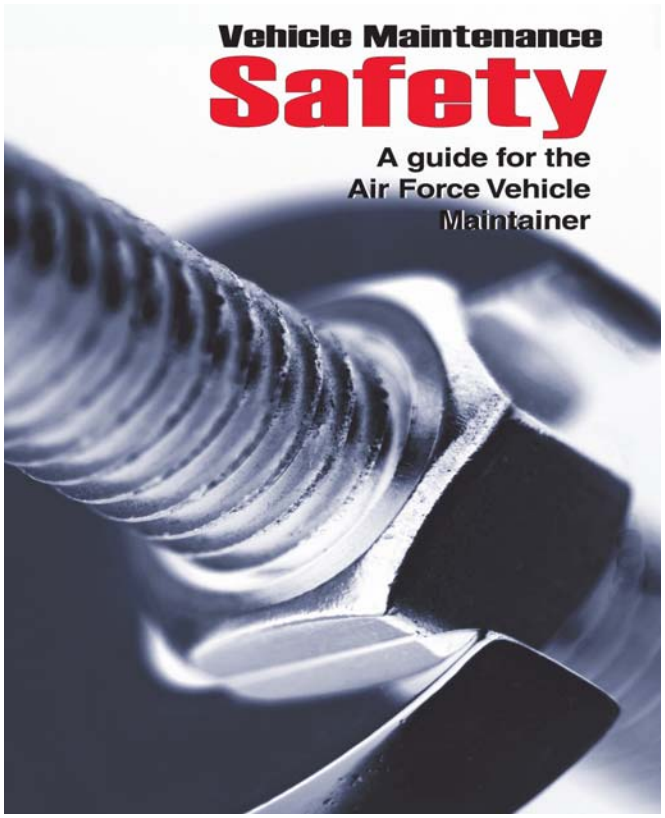


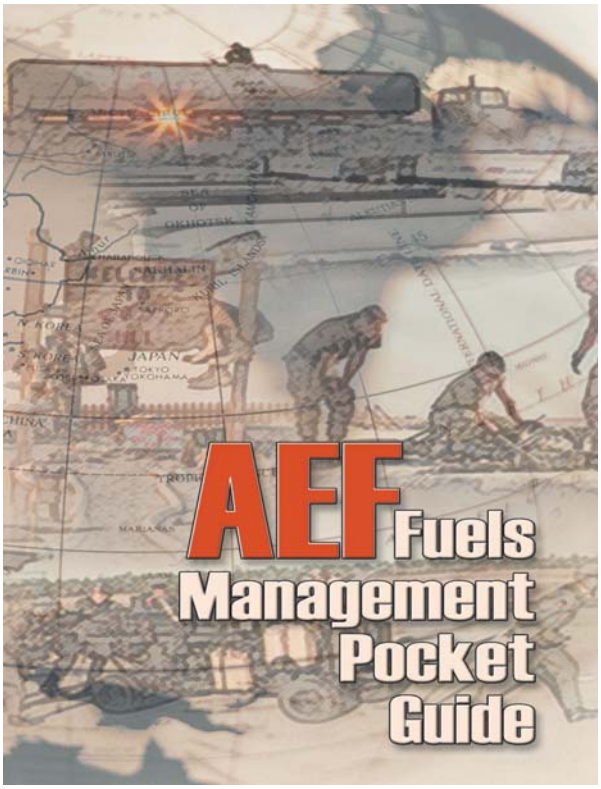
contingency contracting

This handbook was produced by the Air Force Logistics Management Agency for use by Air Force contingency contracting officers. The Deputy Assistant Secretary for Contracting, Office of the Secretary of the Air Force for Acquisition, commissioned this project. It is a hands-on guide that can be used to prepare for deployment while in garrison or while deployed. Limited quantities.

Vehicle Maintenance Safety Handbook

The *Vehicle Maintenance Safety Handbook* was produced in partnership with Air Staff and MAJCOM vehicle maintenance subject-matter experts for use in the Air Force 2T3 vehicle maintenance community. It's designed to improve safety awareness in the Air Force vehicle maintenance community. It provides practical information and draws on lessons learned from actual safety incidents. Limited quantities.





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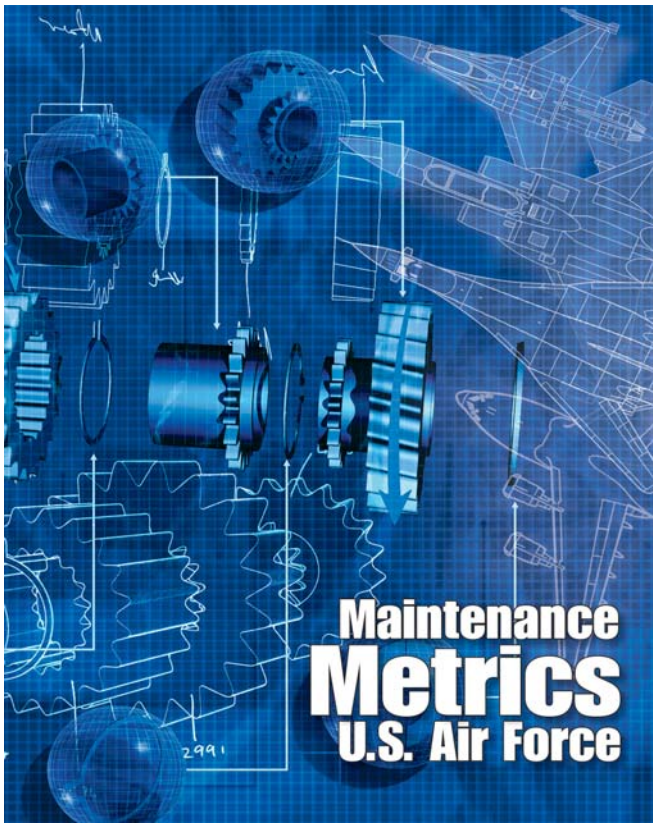
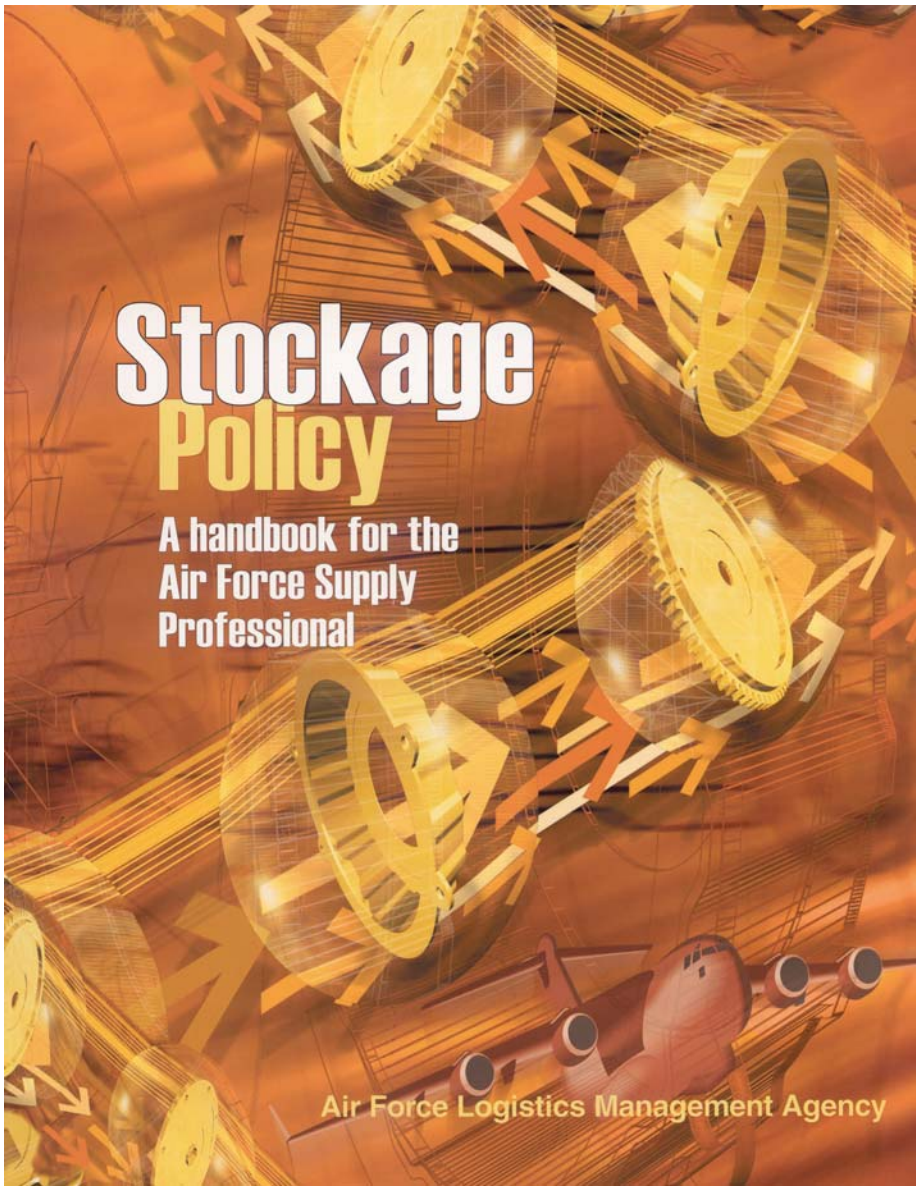


Our guidebooks and special reference material are in high-impact format and meet defined Air Force needs. They're also publications that communicate and will be used where they're needed and when they're needed. They may be ordered by contacting the Office of the Air Force Journal of Logistics or the applicable AFLMA division. There are limited quantities of some of these items.



stockage policy

Knowing stockage policy—understanding the theory behind the formulas—is key to understanding the Air Force supply system and its performance. *Stockage Policy: A Handbook for the Air Force Supply Professional* is a one-source text that explains, in detail, the theory behind the formulas, and it updates a product produced 15 years ago by the Agency. You'll also find it interesting, understandable, helpful, and a handy reference. **Limited quantities. No reprint planned.**

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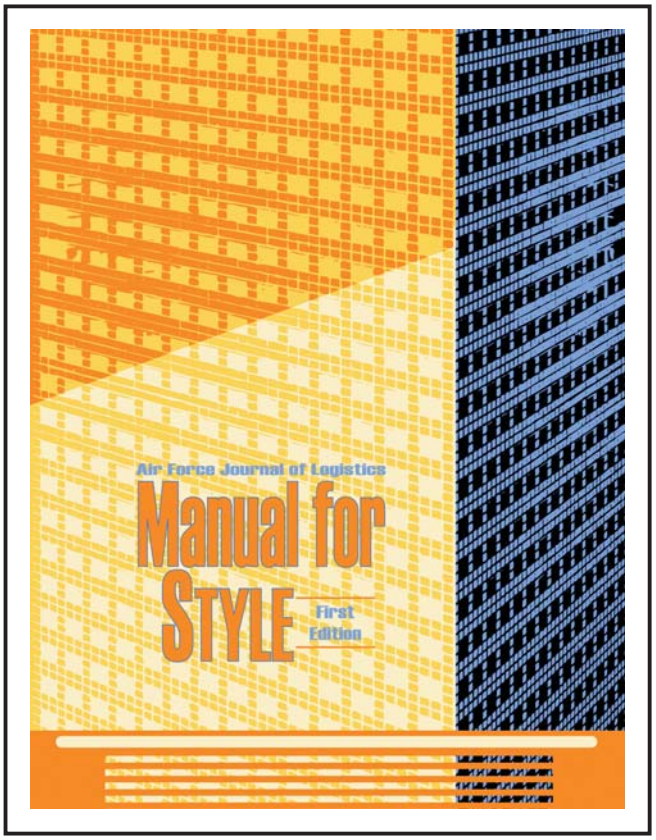
Our reference material for authors and writers is in high-impact format and meets the needs of those wishing to have their work considered for publication by the Air Force Journal of Logistics staff. They're also publications that communicate and are in a user-friendly format. They may be ordered by contacting the Office of the Air Force Journal of Logistics. Electronic versions are also available online.

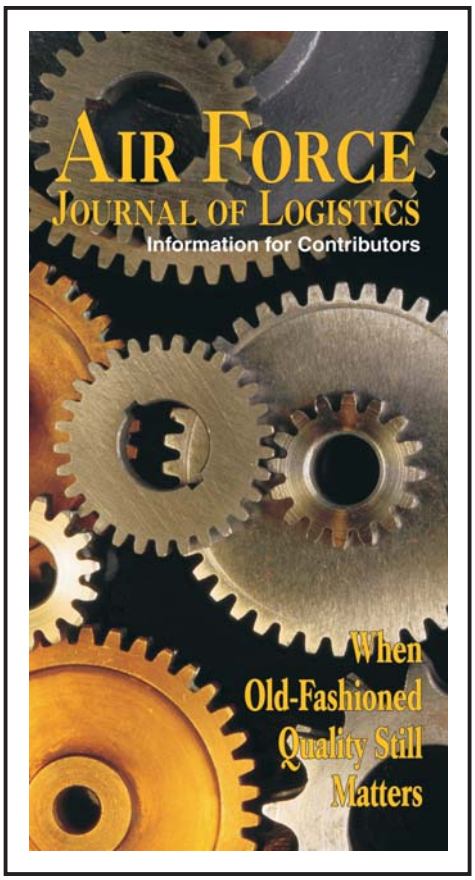


manual for style

Although our language is fluid, it has certain disciplines that constitute an essential part of that language. These disciplines—spelling, grammar, and punctuation—are an essential part of our language, allowing exactness in communication. This style guide provides basic English grammar and style rules and outlines the basic styles and writing conventions used in the *Air Force Journal of Logistics* Ten sections have been included to assist both the reader and the contributor.

information for contributors

The *Information for Contributors* pamphlet provides basic instructions for submitting a manuscript to the Air *Force Journal of Logistics* staff.



The Supply Division is proud to serve the Air Force and help improve its ACS capabilities. Whether it be changes to existing systems, mapping out plans for future systems, developing innovative concepts through our strategic alliances and wargaming efforts, or serving on the many working groups and policy boards that shape the Air Force supply chain, our people are there.

Yesterday, Today, and Tomorrow

Lieutenant Colonel Roger M. Baxter III

Supply

The pace of logistics transformation in the Air Force has continued to gain steam over the last few years, and in 2003, the AFLMA Supply Division was more involved than ever in helping Air Force supply stay in front. Our project managers completed 27 supply projects last year, spanning everything from specific stockage policy issues to cutting-edge concepts like the customer-oriented leveling technique and the Enterprise Data Warehouse (EDW). In keeping with the consolidation of supply, transportation, and logistics plans into a single logistics readiness squadron, the division also participated heavily in cross-functional studies that affect the entire supply chain. In addition to the 28 supply projects, our project managers participated in 11 studies in the maintenance, transportation, and logistics plans areas.

Again, this year, the Air Force was challenged by a major real-world contingency, and our folks answered the call. In less than 24 hours, the Supply Division turned 14 contingency high-priority mission support kits, valued at more than $70M, in direct support of deploying units. Our support of Operations Enduring Freedom and Iraqi Freedom in 2003 underscores our unique ability to perform both long- and short-term logistics analysis. We continue to take pride in our capabilities and experience and, as always, welcome any opportunity to make a difference in Air Force logistics.

At the opposite end of the spectrum, the Supply Division has become an integral player in transforming Air Force logistics under the eLog21 vision. Our project managers have been involved in defining requirements for EDW, plotting the course for the advanced planning and scheduling system, and defining the system architecture for the Logistics Enterprise Architecture and Enterprise Resource Planning System of the future. We are also advisory members of the Air Force Materiel Management Board, Air Force Materiel Management Portfolio Advisory Team, and Materiel Management Enterprise Requirements Board. As always, our folks are key members of the Air Force-level working groups that set supply chain policy, like the Air Force Stockage Policy Working Group and Air Force Supply Wartime Policy Working Group to name just two. And finally, our continued involvement in wargames like Global Engagement VI and Global Mobility 2003 continues to provide Air Force leaders with realistic logistics scenarios and paves the way for future Agile Combat Support (ACS) concept development.

As we help move toward the logistics systems of the future, we continue to be the Air Force agency of choice for improving our current systems. AFLMA, in close partnership with the Logistics Management Institute and Air Force Materiel Command, remains the primary manager of the readiness-based leveling (RBL) system used to push more than 400,000 stock levels to Air Force bases worldwide on a quarterly basis. Our efforts with RBL ensure the right parts are available in the right places at the right times, all with optimal efficiency. And our support does not end with aircraft parts. One project recommended regionalization of communications-electronics parts, which will reduce spares levels by more than 13,000 units, worth more than $85M. Our topnotch Fuels Branch also has set the course for fuels policy, leading the charge in revolutionizing fuels mobility support equipment training so that our fuels technicians stand ready to meet air and space expeditionary forces. In the process, we identified $478K in savings while increasing training quotas by more than 450 percent.

Even while helping to set the course for the future throughout 2003, the Supply Division continued its 30-year track record of improvements to the Standard Base Supply System (SBSS). We continued to define the supply chain concept for SBSS support to centralized intermediate repair facilities, reviewed safety-level and credit return policies to eliminate waste and optimize support to the warfighter, and improved data accuracy on a regular basis. And when our improvements cannot be implemented in the near term, we have the programming capability to write temporary software applications to bridge the gap until a long-term fix can be implemented. In fact, the Supply Division's Air Force Logistics Studies Workshop, a combination of a powerful Oracle database and experienced supply programmers, currently supports five major Air Force-wide initiatives with overarching effects on ACS, all at an annual cost of about $1.2 million less than if they had been contracted to outside companies.

The Supply Division is proud to serve the Air Force and help improve its ACS capabilities. Whether it be changes to existing systems, mapping out plans for future systems, developing innovative concepts through our strategic alliances and wargaming efforts, or serving on the many working groups and policy boards that shape the Air Force supply chain, our people are there. As the logistics enterprise takes shape and our warfighters are called to do more with less in an increasing number of locations, the role of the Supply Division will continue to grow and will become even more critical. The challenges are great, but the men and women of AFLMA look forward to meeting and exceeding them, just as they have for the last 30 years.

2003

Completed 2003 Projects

- Measuring the Impact of Contingency High-Priority Mission Support Kits Normalization
  LS200305010—Consulting Study
- Analyze Repair Prioritization for Items not Included in EXPRESS
  LS200300816—Improvement Study
- BSM Implementation Metrics
  LS200221300—Consulting Study
- Air Force Alternatives for Automating the Weapon-System Support Program Update Process
  LS200211200—Improvement Study
- Consolidation of Refueling Maintenance, Liquid Fuels Maintenance, and Fuels Management Under the Maintenance Group
  LS200328800—Consulting Study
- Reparable Item Adjusted Stock Level Reconciliation
  LS200325802—Consulting Study
- Analysis of Implementing a Single MICAP/AWP Database
  LS200311400—Consulting Study
- NEXRAD System Reliability, Maintainability, and Supply Supportability
  LS199930900—Improvement Study
- Air Force Back-Order Analysis
  LS200126400—Improvement Study
- Analyze Repair Prioritization for Items not Included in EXPRESS
  LS200300816—Improvement Study
- Analysis of Air Force Retail Retention Policy Changes Implemented in January 2001
  LS200117200—Improvement Study
- Fuels Mobility Support Equipment Training
  LS200115100—Improvement Study
- Impact of Force Activity Designator Code Changes on AETC's Supply Support
  LS200300803—Improvement Study
- Analysis of Implementing the *One-Per-User* Rule in Readiness-Based Leveling
  LS200300719—Improvement Study
- Alternatives to Funding Centrally Managed/Procured Equipment
  LS200133400—Improvement Study
- COLT Part I: Assessing Air Force Consumable Item Management Initiatives
  LS200212700—Improvement Study
- COLT Part II: Assessing Retail COLT Implementation
  LS200303602—Improvement Study
- Analysis and Review of Air Force Safety-Level Implementation Issues
  LS200233700—Improvement Study
- Cryogenic Production Improvement Study
  LS200233600—Improvement Study
- Alternative Retail Stockage Requirements for C-E Spares
  LS200020200—Improvement Study
- Analysis of Consumable Item Support for Contingency Operations
  LS200300702—Improvement Study
- The Cost of Eliminating the Peacetime Operating Stock Offset for In-Place Readiness Spares Packages
  LS200311200—Requirements Team Study
- Review Credit Return and Quality Deficiency Report Procedures
  LS200300703—Requirements Team Study
- Air Force Customer Wait Time Metrics Support
  LS200202901—Consulting Study
- Support to Logistics Transformation/Spares Campaign: Virtual Single ICP
  LS200203100—Consulting Study
- Air Force Spares Budget Requirement
  LS200101801—Consulting Study
- Air Force Total Ownership Cost Data Feed
  LS200210200—Consulting Study
- National Stock Number Issue and Stockage Effectiveness (Phase Four)
  LS200205600—Consulting Study

Supply Division

- Enterprise Data Warehouse Functional Requirements
  LS200312801—Improvement Study
- Study of Alternative Demand Data Sources for Computing Readiness Spares Package
  LS200312200—Requirements Team Study
- Assessing Retail Customer-Oriented Leveling Technique Implementation Part III: Assessment of COLT Test
  LS20033603—Improvement Study
- Proof-of-Concept Testing for Automating the Update Process to the Weapon-System Support Program
  LS200303700—Improvement Study
- Procedures for Contractor Inventory Control Points to Set Base Levels
  LS200300815—Improvement Study
- Develop Method to Prioritize Equipment Buy, Repair, and Distribution
  LS200300715—Improvement Study
- Intransit Data Accuracy
  LS200233900—Requirements Team Study
- Air Force Total Ownership Cost-Data Feed
  LS200210200—Consulting Study
- National Stock Number Issue and Stockage Effectiveness (Phase Four)
  LS200205600—Consulting Study
- Air Force Regional Stockage Policy Opportunities—Part II: Proactive Demand Forecasting
  LS200203001—Improvement Study
- Air Force Customer Wait-Time Metrics Support
  LS200202901—Consulting Study
- Support for Fuels Personnel on Flying Status
  LS200325101—Improvement Study
- Air Force Supply Data Bank
  LS200201400—Consulting Study
- Air Force Spares Budget Requirement
  LS200101801—Consulting Study
- Reconciliation of AMC In-Place Readiness Spares Package Adjusted Stock Levels
  LS200334600—Requirements Team Study
- Centralized Intermediate Repair Facility Logistics Readiness Concept of Operations
  LS200316700—Improvement Study
- Measuring the Impact of Consumable Item Normalization
  LS200328802—Improvement Study
- Review of Readiness-Based Leveling (RBL) Logic Used to Assign Problem Item Flags
  LS200333500—Requirements Team Study
- Impact of Force Activity Designator Code Changes on AETC Supply Support: Part II
  LS200330800—Improvement Study

Implementing the proposed recommendations to current credit return and QDR policies will reduce inaccurate use of approximately $47.8M of credit annually.

Motivating Base-Level Repairs

Credit

Major Kim L. Davey

Background

The policies and procedures for granting credit to maintenance upon turn-in of Materiel Support Division (MSD) assets have not been reviewed since implementation of depot-level reparable procedures in 1992. AFLMA was tasked to look at these procedures to ensure the right credit is being granted and granted appropriately. In addition, we were asked to look at quality deficiency report (QDR) procedures.

As a part of this study we:

- Researched and identified current (published and draft) policies to award credit for MSD assets. We identified the existing policy to make sure it was being followed. We also identified any logical inconsistencies in the current policy.
- Validated the Standard Base Supply System (SBSS) code against current policy. The Standard Systems Group (SSG) Logistics Information Systems Program Office assisted us in running test transactions to see if the SBSS code accurately matched the policy. We compared the results to the expected results.
- Researched maintenance and supply QDR procedures.
- Analyzed all SBSS fiscal year (FY) 2002 turn-ins (TIN).
  - Identified number and dollar value for credit and no credit.
  - Identified and reviewed suspect items. Was the credit justified (future sale)?
- Recommended improved policies and procedures where necessary.

Credit Return Policy

Credit is granted to MSD customers upon turn-in of assets to the retail supply organization. Determining the type of credit and whether credit is granted based on various factors: the expendability, recoverability, and reparability code (ERRC) (XD, XF, or XB); due-in-from-maintenance (DIFM) status; asset condition (serviceable or unserviceable); and the buy position of the asset (the credit indicator code). There are two credit indicator codes—A and D. Credit indicator code A indicates the asset is in a buy position (assets are short of the requirement with a lead time of 3 years out), and D indicates the asset is not in a buy position. Credit indicator codes apply only for turn-in of non-DIFM assets. Bases can override system controls with a credit override code of Y (grant credit) or N (deny credit). Types of credit granted are exchange, standard, markup, carcass, and latest acquisition cost.

Current policy for granting credit upon turn-in of MSD assets is defined in Air Force Manual (AFMAN) 23-110, Volume 1, Part 1, Chapter 7, and Volume 2, Part 2, Chapter 13. Tables 1, 2, and 3 provide a synopsis of the current policy. They outline ERRC, DIFM status, and the credit indicator (if applicable) or credit override codes that determine the type of credit authorized. Note that the credit indicator code is applicable only to non-DIFM assets as DIFM assets receive credit based on what the customers were charged when they were issued the asset.

SBSS Code Validation

First, we determined if the SBSS logic matches the current policy outlined above. The SSG Logistics Information Systems Program Office tested the code and verified the system was correctly processing credit for turn-ins. It conducted tests for each ERRC by DIFM status, credit indicator code, and credit override code to verify that the SBSS credit return code matches policy.

Credit Indicator Codes

Logical Inconsistency

The credit indicator codes are assigned based on the buy position of the asset. Item managers update these codes whenever necessary, and the update is sent to the base via a stock number users directory (SNUD) update as required. We discovered *the logic of the credit indicators is incomplete.* There are many assets that are not in a buy position that still may have a repair requirement. Under the current policy, maintenance is discouraged from repairing assets with a credit indicator code of D because they will not receive credit upon processing the turn-in. This may drive the wrong behavior at the base because, potentially, the base will not repair an item where there is a worldwide repair requirement. Some examples to illustrate this problem are shown in Figure 1.

The credit indicator should motivate the right behavior; therefore, *the indicator should consider the item's worldwide repair position.*

Credit Indicator Accuracy

The SNUD update process is automated and should ensure consistency of data on the same item loaded at different bases. However, the results of this study indicate this is not the case. Item records were pulled for the last day of each quarter and matched to the turn-ins processed during the next quarter. The credit indicator code is on the item record. A comparison of the same item, at the same time (end of quarter item record check), at different bases, revealed cases with different indicators assigned at different bases. During the first quarter of FY02 there were 46,764 turn-ins against 13,071 national stock numbers (NSN). Of these, 775 (5.9 percent of the NSNs) had different credit indicator codes listed at different bases. For example, NSN 1270012330011WF had a credit indicator code of A loaded at 26 bases and D loaded at 18 bases. These cases indicate the SNUD-update process is not clean. It is imperative the SBSS has accurate information to ensure the proper granting of credit.

ERRC	DIFM Status	Credit Indicator/ Override	Type Credit
XD	DIFM	N/A	Exchange
XF	DIFM	N/A	Standard
XD	Non-DIFM	A or Y	Carcass
XF or XB	Non-DIFM	A or Y	LAC

Table 1. Serviceable MSD Credit Return Policy

ERRC	DIFM Status	Credit Indicator/ Override	Type Credit
XD or XF	DIFM	N/A	None*
XD	Non-DIFM	A or Y	Carcass
XF or XB	Non-DIFM	N/A	None
XF or XB	Non-DIFM	Y	LAC
*Exception: DIFM assets turned-in 60+ days after issue will receive markup credit.			

Table 2. Unserviceable MSD Credit Return Policy

ERRC	DIFM Status	Credit Indicator/ Override	Type Credit
XD	Yes or No	N/A	Exchange
XF	Yes	N/A	Standard
XF	No	A or D	LAC
XB	No	N/A	Standard

Table 3. MSD Deficiency Report Credit Return Policy

Item A

Gross Requirement	100	
Assets	50	Credit Indicator A – Buy 25 – Credit
Serviceable Assets	72	

Motivate base repair - short 28 serviceable assets = Grant Credit

Item B

Gross Requirement	100	
Assets	100	Credit Indicator D – No Credit
Serviceable Assets	50	

Motivate base repair – short 50 serviceable assets = Grant Credit

Item C

Gross Requirement	100	
Assets	300	Credit Indicator D – No Credit
Serviceable Assets	150	

No repair required = No Credit Should be Granted

Figure 1. Logic of Credit Indicator Codes

FY02 Data Analysis

To properly analyze the credit return process and determine if changes to current policy are needed, we analyzed all SBSS MSD TINs for FY02 (extracted from the Air Force Logistics Supply Workshop). During FY02, there were 691,000 turn-ins processed, of which 599,000 were maintenance transactions (activity codes B, C, J, R, and X). Of these, 165,000 received credit, whereby credits received were 7.8 percent of the total extended cost of the assets turned in. Details of these transactions are shown in Table 4.

We next reviewed the conditions that determine whether credit is received. A complete breakdown is shown in Table 5.

The current policy for serviceable DIFM (XD) assets is to provide exchange credit. The customer pays for the asset upon issue, and if it is returned serviceable, the customer gets the money back. Non-DIFM assets include items from the following categories: found-on-base (FOB), special purpose recoverable asset maintenance (SPRAM), and bench mockups. However, the non-DIFM turn-ins shown in Table 5 do not include SPRAM or bench mockup turn-ins since they are processed with activity codes D or E, not the activity codes we pulled for this analysis.

FOB assets are items a customer has found that do not have a DIFM detail linked to the asset. Repair cycle personnel are required to conduct a search through the SBSS transaction history records to determine the owner of the asset prior to processing the turn-in. If they cannot determine the owner of the property, they are supposed to add the asset to the item record via an inventory adjustment. If they determine the owner of the asset, they coordinate with the owner to facilitate turn-in of the asset if it is no longer required.

We question the veracity of the current policy of granting carcass credit upon turn-in of serviceable FOB non-DIFM assets. Credit for these assets should be based on a future need (buy and repair), and the credit granted should be in line with the credit policy for DIFM assets. Policy should motivate needed repair and not unnecessary repair.

In the outbrief to the sponsor, the Air Force Materiel Command Supply Management Division, we were asked if we had looked at SPRAM or bench mockup turn-ins. These turn-ins are not included in the numbers above since our initial analysis was on maintenance turn-ins (activity codes B, C, J, R, and X) only but are discussed below. SPRAM and bench mockup assets are maintained on an equipment detail record and used to perform functions such as detecting or isolating faults, calibrating or aligning equipment, and duplicating an active system installed in an aircraft or on online equipment. Current policy in AFMAN 23-110, Volume 1, Part 3, Chapter 7, and Volume 2, Part 2, Chapter 22, contains conflicting guidance on who pays for SPRAM and bench mockup assets. Chapter 7 states they are paid for by the system program director, and Chapter 22 states that the units pay for the assets. The current policy of granting carcass credit upon turn-in of SPRAM or bench mockup assets assumes the unit has paid the standard price for the asset initially and should receive at least carcass price upon processing the turn-in. A subsequent review of SPRAM and bench mockup turn-ins showed there were 1,012 SPRAM and 805 bench mockup turn-ins processed in FY02, of which 139 SPRAM assets received $3.7M in credit.

We next analyzed unserviceable non-DIFM TINs. Current policy is to grant carcass credit for these items. There is no logical reason for credit for any *unserviceable* FOB non-DIFM turn-in. There is no way to know if the customer was ever charged for the item; therefore, no credit should be granted for these assets.

Next, we analyzed *unserviceable* DIFM turn-ins. The 1,193 unserviceable DIFM turn-ins that received markup credit were authorized credit according to current policy. The customers were charged the markup price 60 days after they were issued the asset, and they are reimbursed these charges upon turn-in of the asset.

Of the remaining turn-ins, 329 had conflicting maintenance and supply condition codes. In these cases, maintenance turned in the asset as unserviceable (maintenance action taken codes 1-9), and supply processed the turn-in with a supply condition code of D-serviceable (test and modification). Since the asset was unserviceable, according to maintenance, they shouldn't have received credit according to current policy. However, since supply

Transaction	Number TIN	Dollar Value
All TIN	691,709	$32.7B
Maintenance TIN	599,286	$29.4B
TIN Receiving Credit	165,763	$2.3B

Table 4. FY02 SBSS Data Statistics

used a serviceable condition code, SBSS granted the credit. AFMAN 23-110, Volume 2, Part 2, Chapter 13, Attachment A-5, defines the logic for allowable maintenance-action-taken codes by ERRC for the given supply condition code. The logic allows supply to use condition code D for all maintenance-action-taken codes: serviceable and unserviceable. In addition, Chapter 13, Attachment D-3, Note 16, states assets turned in with condition code D will have an unserviceable detail record created. There are no other references to the use of supply condition code D with maintenance-action-taken codes 1-9 to justify this type transaction. Logic dictates that if maintenance says the asset is unserviceable it should not receive credit upon turn-in of the item. We think the SBSS should reject any turn-in transaction with conflicting condition codes.

Proposal for Credit Return Policy

We propose near- and long-term changes to the new credit return policy. The near-term proposal changes the credit granted for serviceable non-DIFM assets from carcass to exchange and denies credit for unserviceable non-DIFM assets. In addition, the credit indicator code logic should be modified to include the repair position of the asset. The long-term credit return proposal is discussed below:

> Turn-ins of SPRAM and bench mockup assets will be processed as though they are FOB non-DIFM assets in this proposed policy change, which, for a total of 139 SPRAM turn-ins that received credit in FY02, would have reduced the credit granted from $3.7M to $705K. However, since we can determine the customer paid the standard price for the asset initially, the customer actually should receive carcass credit if the credit indicator code is A, regardless of serviceability. Unfortunately, the system changes necessary to differentiate between FOB and SPRAM and bench mockup turn-ins would require an additional edit in the code on the activity code of the turn-in transaction, which is not a part of the edits currently used to determine credit upon turn-in of assets. For these reasons, the Air Force should consider SPRAM and bench mockup turn-ins to be the same as other FOB non-DIFM turn-ins for the near term but include the requirement for granting carcass credit for them when developing the business rules to be incorporated in the future Enterprise System.

Impact of Credit Return Proposal

Applying our proposed near-term credit policy to FY02 SBSS TIN data yields the changes to credit granted as shown in Table 6.

The proposed changes to the credit return policy would have reduced total credits by an estimated $47.8M in FY02. These numbers do not reflect changing the credit indicator code to include repair as that information is not available and does not include the SPRAM and bench mockup turn-ins since they were not a part of the original analysis.

Accurately including the repair requirement in the credit indicator requires a real-time (or near real-time) system to determine and communicate to the bases. Base maintenance personnel must be able to check the credit indicator to determine whether they should perform the repair action or not. The current system does not meet this need. The long-term solution is to provide the real-time buy-and-repair position of any asset to the base to make repair decisions. Basically, the Air Force could make central worldwide (base and depot) repair decisions. This only would allow credit for those with the new credit indicator code indicating a buy or repair requirement exists. The Air Force should include this requirement in the future Enterprise System.

QDR Analysis

During FY02, there were 16,252 QDR TINs that received credit in the amount of $333M. They accounted for 9.8 percent of the turn-ins receiving credit and 14.45 percent of the credits granted during the year.

Some of the assets turned in as QDRs are warranty assets. For example, AMC uses the QDR process for turn-in of their KC-135 Pacer CRAG-warranted assets to ensure maintenance receives credit upon turn-in. Using this process for warranty assets prevents the SBSS from capturing demand data on these items, thereby impacting supply support. There were 2,031 turn-ins processed with QDR procedures for Pacer CRAG warranty assets during FY02.

Bases are using QDR procedures for warranty assets at the direction of the Air Staff. There is a supply condition code W for turn-in of warranty assets identified in AFMAN 23-110, and SBSS is coded to grant credit under the same rules as QDRs receive credit. However, at this time, a turn-in processed with condition code W will reject. The SSG Logistics Information Systems Program Office has a difficulty report (DIREP) (#3315951) in the queue that will allow the use of a supply condition code W for turn-in of warranty assets. In addition, the warranty does not always apply to every asset under a stock number, thus complicating the process. In these cases, the use of serial number tracking is imperative, but the SBSS and wholesale supply systems currently do not support this process. Once the DIREP is resolved, major commands will need to provide guidance to their bases on which assets are under warranty and how to process these assets. In the meantime, the SSG Logistics Information Systems Program Office and

	Serviceable	Unserviceable	Total	Credit Received
DIFM	159,732	1,588	161,320	$2.2B
Non-DIFM	2,867	1,576	4,443	$62.0M
Total	162,599	3,164	165,763	
Credit Received	$2.2B	$68M		$2.3B

Table 5. Credit TIN Details

	Current Policy		Proposed Policy	
	Serviceable	Unserviceable	Serviceable	Unserviceable
DIFM	159,732	1,588	159,732	1,193
Non-DIFM	2,867	1,576	2,427	0
Total	162,599	3,164	162,159	1,193
Credits Received	$2.23B	$69M	$2.22B	$38M

Table 6. Impact of Near-Term Credit Return Proposal

AFLMA Supply Division will develop, test, and field interim procedures to capture the demand data for warranty assets.

Under current policy and procedures, QDRs are not counted as demands; neither their failure nor pipeline time is included in the D200A requirements computation. QDR logic assumes there was a faulty repair of the first failure, so they do not record the second failure in the system. The customer receives the money back upon turn-in of the QDR asset since they were issued an unserviceable part. The QDR program is managed through maintenance at base level.

The main method of tracking QDR assets is via the G021 system. This system tracks all QDR actions and transmits disposition instructions to base maintenance. Base maintenance then provides this information to the repair cycle section in the logistics readiness squadron. G021 is not linked to the SBSS, and the two systems use different document numbers to track these assets. This lack of system connectivity creates disconnects at the base level with the processing and tracking of QDR actions directed by the depot.

The first issue to address is, should QDRs count as failures? Not counting QDRs as failures impacts support since there are no levels for extra failures and pipelines. It is a known fact that QDRs increase supply pipelines. Since QDRs are not recorded as failures, the readiness-based leveling (RBL) system does not include these pipelines in base levels.

We used RBL to assess the impact of the QDR pipelines. With no increase in requirements in FY02, worldwide expected back orders (EBO) increased by 18 percent for the 2,073 NSNs that experienced QDRs during FY02. Failure to account for QDRs increases Air Force-wide EBOs by 6 percent. If RBL allocated levels to support the QDR failures, then there would be 69 RBL problem items, with 42 of them being new problem items. Problem items indicate areas where the D200A requirement is too small to meet the pipeline needs.

Therefore, should the Air Force count QDRs as failures, thereby increasing the worldwide spares requirement? Adding these assets to the D200A requirements system would require a one-time increase to buy requirements of $37M and a one-time increase in repair requirements of $179M. In addition, the annual repair cost to fix the QDR items in FY02 was $149M. Unfortunately, none of these costs is formally captured in the budgeting process.

Before we determine whether to increase the requirement for all QDR items, we look a little closer at the QDRs in FY02. Ninety-three percent of the NSNs experienced less than ten QDRs during the year, but 7 percent have a high number of QDRs (more than ten). These 7 percent account for 68 percent of the credit granted for QDR assets.

In addition, 12 percent of the items with more then ten QDRS are not really QDRs; they are Pacer-CRAG warranty turn-ins. These failures should be recorded as demands (and would be if the supply condition code W DIREP was resolved). We suspect there are other warranty items included in these QDR numbers that we cannot identify. Failure to include these warranty items in the requirements and allocations systems is directly affecting supply support of these warranted items.

QDR Proposal: Requirements and Allocations

The issue of whether to include QDRs in the requirements system is complicated. QDRs reduce support; however, we must consider whether past QDRs are indicative of future QDRs or an isolated incident of a faulty repair action. Also, the Air Force would not want to buy additional spares if the maintenance practice that caused the QDR was corrected. In any event, the cost to include QDRs in the requirement generates a significant expense (net requirement increases of more than $200M). We sought to find ways to identify the items that caused the largest support impact (highest EBOs) yet do not increase the requirements cost significantly. As shown, selecting items with more than ten QDRs in a year accounts for 68 percent of the QDRs credit received. However, we would like to develop a rule to forecast items that will have ten or more QDRs in a year rather then wait for the end of the year. We seek to develop an automated process to identify qualified items for possible inclusion in the requirements system.

Current AFMC policy, as outlined in an AFMC Supply Management Division policy letter, is:

- Authorizing input of QDRs as a failure (base not reparable this station) when:
  - Number of QDRs is significant; in general, more than three QDRs in each of the two most recent quarters, and
  - A true QDR has not been documented, or there is no projected date when the QDR will be resolved; thus, usage should decline.

- QDRs are authorized to be added to the current and first forecast factors only to prevent buying pipeline requirements only to see the problem go away.

With its current policy, AFMC is predicting correctly when an NSN will experience ten or more QDRs in a year 79 percent of the time. We tested several alternatives and found one that will predict correctly more than ten QDRs in a year 83 percent of the time. Our proposed method is to select NSNs with two or more QDRs in consecutive quarters with a minimum of seven QDRs in the two quarters. Our proposal is that for qualified items, meeting our criteria, the item manager should consider adding the item to the:

- D200A requirements and
- RBL allocations for distribution of levels.

Using AFMC Supply Management Division guidance as a baseline, we propose the following business rules for adding qualifying NSNs to the D200A requirements system:

- Ensure the QDRs are properly reported (complete with transaction histories and exhibits if requested).
- Nonwarranty NSNs (NSNs under warranty turned in using QDR procedures should be automatically included in the requirement. AFLMA and SSG are evaluating interim procedures to capture this demand in both the RBL and D200A systems to use until the supply condition code W DIREP is processed).
- Resolution of the problem causing the QDR is lead time away.
- The asset is not scheduled for modification or mission change.
- The equipment specialist documents the QDRs as failures on the factors printout.
- Forecast the requirements increase only until the problem is planned to be resolved.

Recording QDRs as failures for qualifying items will increase the requirement in D200A, but it will not increase the base demands. Therefore, RBL has an increased requirement to allocate but does not see the increased demand, so it does not know what bases experienced the QDRs. It would require manual (probably error-prone) procedures to adjust base demand data for qualifying QDR items.

To determine if the Air Force needs to adjust the base demand, we compared RBL levels resulting from increasing the worldwide requirement for qualifying QDRs but did not increase the base daily demand rate to increasing the worldwide requirement and increasing the appropriate base daily demand rate. RBL will allocate the increased requirement without increasing the base demand rates. Basically, this assumes that the QDRs occur in the same relative proportion as the non-QDR demand rate. A base with twice as many non-QDR failures could have twice as many QDRs.

For the 231 family master NSNs that had ten or more QDRs, RBL predicts there would be 713 expected back orders if both the requirement and the base daily demand rates reflect the QDRs. Compare that to the 729 expected back orders RBL predicts if the requirement and base demand were increased, but RBL set the base levels without the base demand increasing (what would happen in an actual situation unless the Air Force took extraordinary action to manually increase base demand rates). Out of the 2,104 NSN-base levels, 51 had different levels (50 were within 1, and 1 was within 3).

We performed our analysis on all the QDR items with ten or more QDRs. Our results above are the worst case scenario. Not all items analyzed are true QDRs. For example, 17 of the items evaluated are Pacer-CRAG warranty assets and accounted for 9 of 16 (729-713) of the expected back orders. We do not think the Air Force needs to increase the demand rates for qualifying QDRs at the bases. The resulting RBL allocation for the increased requirement above provides adequate support, and it is not worth the manual effort required to reflect the QDRs in the base daily demand rates.

Adding these NSNs to the D200A requirement and RBL allocation process should be within the same guidelines the AFMC Supply Management Division has already published. The item manager may maintain the QDR failure data in D200A for qualifying items if there is no planned change in the maintenance process and it appears these items will continue to experience QDRs at about the same rate. Also, the QDRs are valid—there is not a significant number of the QDRs being sent back to the base for reversal.

QDR Financial Issues

Under the current system, bases receive credit for the QDR upon turn-in. Additionally, the supply management activity group (SMAG) does not pay for the repair. Thus, the depot maintenance activity group (DMAG) incurs the cost of the repair but does not directly charge SMAG. However, all DMAG costs are covered, so QDRs are paid for in the overhead (surcharge) charges to SMAG. Today's financial system does not track QDR costs directly; thus, the cost of QDRs is hidden in overhead charges. It would be better to record and budget for QDRs directly. We still should provide credit and pay via an overhead line item but track and account for QDRs separately. The system should record that there was $333M of credit returned for FY02 QDRs with $4.2M credit reversals requested for invalid QDRs. Air logistics center managers should flag NSNs that meet these criteria, and depot maintenance should prioritize developing solutions for the NSNs that are experiencing high numbers of QDRs.

Expected Benefits

Implementing the proposed recommendations to current credit return and QDR policies will reduce inaccurate use of approximately $47.8M of credit annually; improve policies and procedures for credit returns, warranty assets, and QDRs; and increase the MSD cash position, resulting in the better use of available funds.

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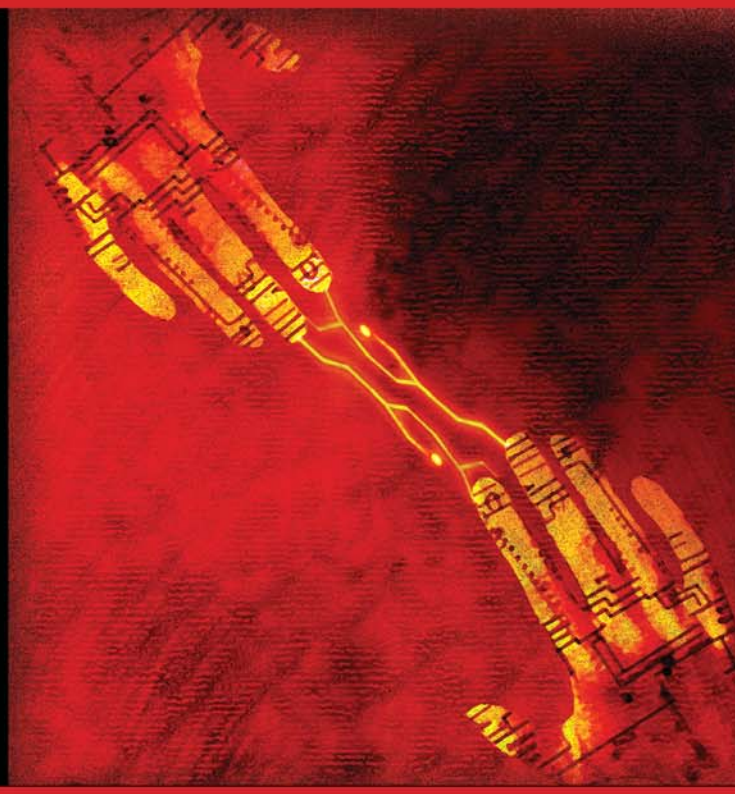

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Back Orders are Expected

Major Kim L. Davey

When fulfilling back orders from the source of supply exceeds the established O&ST, retail customers may feel the impact through increased high-priority back orders. Time is a relevant consideration for analyzing back orders.

In a perfect world, we would have every possible part required to support our weapon systems sitting on the shelf at the base, ready for any request from maintenance. Or maybe in that perfect world, someone has actually invented the *replicator machine* of Star Trek fame, and we can replicate any part we need upon request. However, that perfect world requires either unlimited funds or the inventor of the replicator. Since these options are not available at this time, other methods of determining what parts to buy and stock were developed over the years. These methods all plan for and anticipate that customers will experience back orders. Although the term back order has connotations of failure, it is important to realize that back orders are not automatically a bad thing.

So what is a back order? It depends on who you are, since the term back order means different things at the base and wholesale levels. From the base perspective, there are three types of back orders: customer dueouts, readiness spares package (RSP) dueouts, and stock replenishment dueouts. At the wholesale level, a back order is any requisition from the base that is not filled within the predetermined order and ship time associated with the item requested.

So what is the impact on the customer of the different types of back orders? All base-level back orders are not equal in terms of how important it is to resolve them; therefore, actual customer impact must be a relevant consideration in any analysis of back orders. The possible customer impacts that a back order might cause then are mission capabilities (MICAP) (grounding a weapon system), awaiting parts (holding up repairs in the back shop), aircraft delayed discrepancies, other customer requests, kit replenishments (RSPs), and peacetime operating stock (POS) replenishments.

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One could debate whether replenishing an RSP should be classified as satisfying a customer need or replenishing a POS level. From a theoretical standpoint, RSP levels differ from POS levels in that they are designed to be relatively static and used only in time of war. If this were the case, then any RSP replenishment action occurring during peacetime would be if the kit range or depth changed, and this should be classified as a POS-replenishment-type back order.

However, from a practical standpoint, wartime kit levels are used regularly as additional warehouse levels; that is, as an additional base safety level. In this case, a kit replenishment action occurs because replenishment of POS levels was not timely. If the kit had not been at the location, the kit replenishment action would have been passed to the depot as one of the customer-need-type back orders. So kits are located at many bases, and using them as a source of additional safety stock is perfectly legitimate, in which case, a kit replenishment action should be classified as a replenishment type back order.

Back-Order Time: An Important Consideration

At a base, when a customer requests an item that is available on the shelf, the request is filled in a minimum amount of time. A request for an item that is not on the shelf requires more time to fill, as supply will have to requisition the item from its source of supply. At the source of supply, any request from the base is going to take at least the order and ship time (O&ST) to fill. O&ST is accounted for within the stockage policy formulas for economic order quantity and readiness-based leveling (RBL) methods used to determine stock levels at the retail base. When fulfilling back orders from the source of supply exceeds the established O&ST, retail customers may feel the impact through increased high-priority back orders. Time is a relevant consideration for analyzing back orders.

Determining an Acceptable Level of Back Orders for Reparable Items

As already discussed, back orders are expected, and our systems plan for a certain number of back orders. However, not all back orders are acceptable, and we need to determine when the number of back orders is too many. Just thinking about an acceptable level of back orders makes the correct assumption there are going to be back orders in the system for various reasons at any given time. For reparable items, the Air Force requirements determination model in D200A implicitly and base-leveling model (RBL) explicitly optimize requirements based on the number of time-weighted, base-level back orders that will be generated in the system. In an RBL sense, the expected number of depot back orders is the number of end user, customer dueouts, plus the number of base-level stock replenishments. This is the long-run, expected number of depot requisitions for peacetime levels. It does not include depot back orders caused by level changes or kit replenishments. Therefore, we only are interested in items that have an *unacceptable* number of back orders. We define unacceptable as more back orders than normally expected and with some negative effect on the Air Force mission.

To figure out which back orders do not meet expectations, we propose a three-step process to identify those national stock numbers (NSN) that have an unacceptable level of back orders. The first step is called the *Rule of 5*—any NSN whose actual depot back order (minus RSP back orders) is five or more above the EBO. Using this rule identifies the 30 percent of NSNs that are causing 77 percent of the back orders.

The second step is to eliminate NSNs that do not have any (SPRS) back orders. Since SPRS back orders reflect the highest level of mission impact, item managers should review them first. This step reduces the 30 percent of the NSNs (77 percent of the back orders) identified with the *Rule of 5* to 13 percent of the total NSNs and 40 percent of the back orders.

Even some SPRS back orders are expected, so the third step is to analyze these remaining back orders to identify those with excessive back-order time. We used 15 days as our criteria since the O&ST for requisitions is 7 days for continental United States (CONUS) and 15 days for outside-the-CONUS deliveries, and we wanted to err on the side of caution. This step further narrowed the list of NSNs that required management review to 5 percent of the total number of NSNs and accounted for 19 percent of the total number of back orders. Using this three-step process identifies the critical items that are causing the most customers hurt for increased item manager attention.

Management Review

Now that the dataset has been defined, the next step is to decide what to do with this information. We, therefore, propose three management review actions, to be conducted by either the item manager (IM) or the supply chain manager (SCM). This review should determine why back orders for these NSNs exceed the expected back order (EBO) and do so with the minimum amount of manual work.

- The EBO assumes there are sufficient assets (serviceable and unserviceable) to meet the requirement (the allocated levels). The first check should be to see if assets meet the allocated levels. If there are not sufficient assets, does the shortage account for the additional back orders? Theoretically, one should compute a new depot back-order expectation with the available assets. Asset shortages generally would result in more depot back orders than just the number short. If there is a capability to recalculate (we discuss this more later in the report) the expected depot back orders, then do so and reapply the three steps. If not, assume every asset shortage drives one depot back-order increase and see if that explains the unacceptable back orders. If not, go to diagnostic two. If the item no longer has five or more back orders

than expected (with available assets), there is relatively little an IM can do to reduce back orders except ensure the item is on purchase order.

- The EBO assumes the number of units in each of the actual pipelines (demand rates and pipeline times) matches the forecast. The next check should be to compare the actual demand to the forecasted expected demand and the actual pipeline (for example, retrograde, depot repair, base repair, and O&ST) times to the forecasted times. If demand is greater than forecasted, recalculate the EBOs with the actual demand. If that does not explain the excessive back orders, compare the actual pipeline values (demand times pipeline times) to the forecast values. If the actual is larger and the pipeline time is longer, determine why the pipeline time is longer (see the next diagnostic). If the forecasted time (or demand) does not match actual and is consistently larger, then one action would be to increase the forecasted time (or demand) in the wholesale requirements system, which may drive a higher requirement.
- Determine why the actual pipelines exceed the forecasted pipelines. Step 2 identified which pipeline was larger than expected. For those pipelines, determine if there are constraints from meeting the forecasted times. For example, awaiting parts problems or capacity constraints.

There is at least one other reason there may be excessive depot back-order-level changes. Our model computes expected depot back orders for the long run, but level changes will generate back orders, and until existing stock meets the new levels (redistribution or additional repair actions), there can be a spike in depot back orders. A diagnostic should see if the levels changed and provide time (a repair or redistribution lead time) for the system to react prior to further management review.

We conducted our analysis using the raw data from DO35A and the RBL CLS files. This process is labor-intensive and should be automated to take full advantage of the available information. The Air Force Materiel Command (AFMC) has two automated Access-based tools currently in use that use different portions of the data used for our analysis. These two tools are the Back Order Analysis and Reporting Tool (BART) and the Supply Chain Managers Metric Tool (SCM^{2}T).

BART includes AFMC back orders. It captures the D035A data every month and converts it into the metrics used by the air logistics centers so they can analyze the back orders and explain spikes in performance or negative trends. The drawback of using BART as the sole back-order analysis tool is that it does not look at what back orders were expected; it just looks at total back orders and the length of time a NSN has been on back order.

SCM^{2}T provides SCMs the capability to set realistic and auditable targets for Air Force-managed reparable items. The tool models the reparable item requirements system as it exists today. The target metrics produced by SCM^{2}T represent expected performance if everything operated as forecasted. The tool pulls its data from the following systems:

- D035C: Reportable Asset Management Process
- D035E: Readiness-Based Leveling
- D200A: Secondary Item Requirements System
- D165B: MICAP Reporting Database
- D087X: EXPRESS

Within SCM^{2}T, RSP item levels are added to the RBL-authorized levels to get a total authorized base stock level; therefore, the expected base-level back orders will set existing levels. We recommend AFMC combine the two tools to apply our three diagnostic steps to identify items for management review.

Final Thoughts

It looks like we will continue to experience back orders until someone invents the replicator machine. Therefore, the next best thing we can do is identify those NSNs that are hurting our customers the most and resolve the situations causing these back orders to best support the mission.

Of course, someone could just invent the replicator—Any Takers?

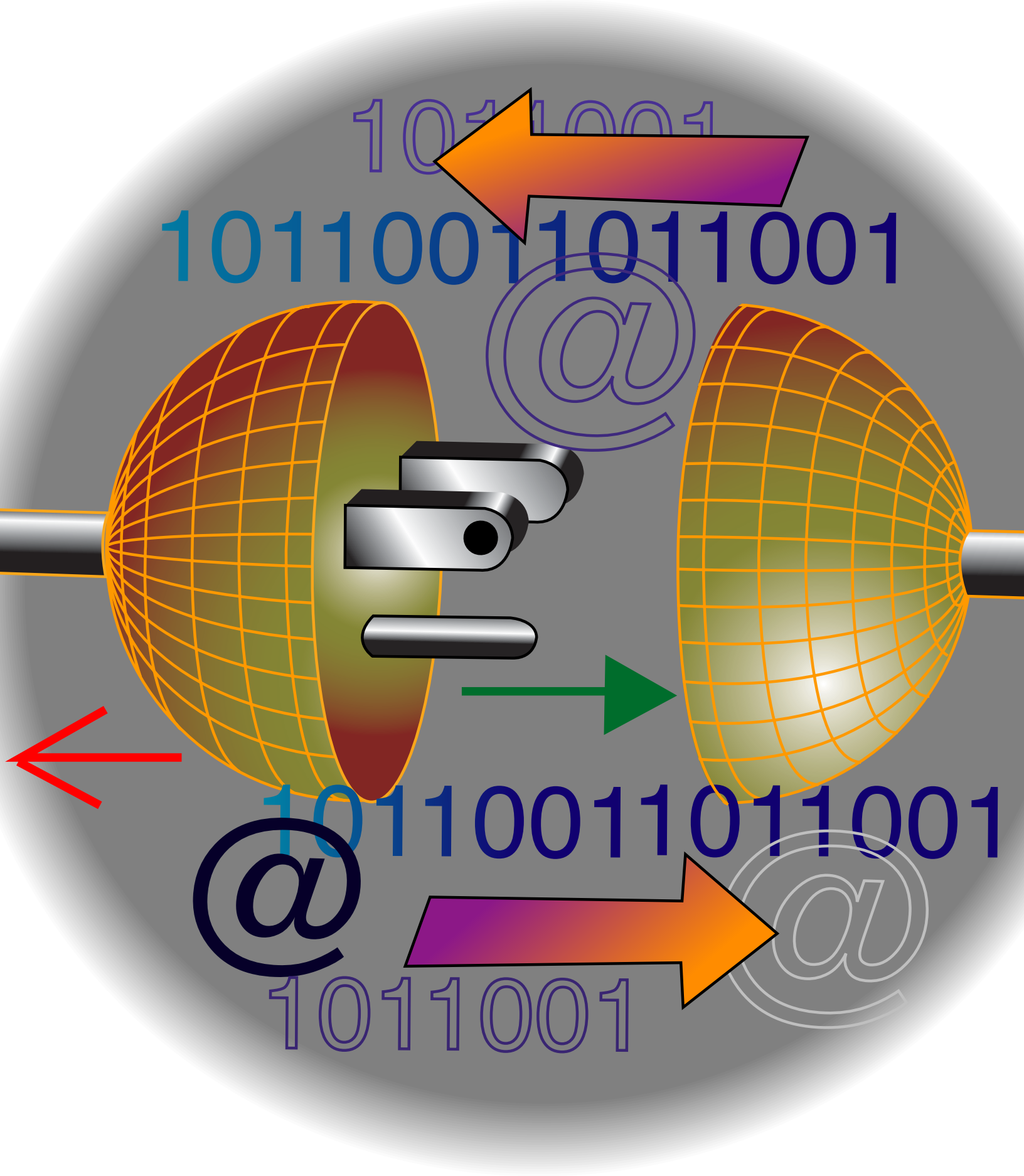
Beam me up, Scotty….

Government's view of the economy could be summed up in a few short phrases: If it moves, tax it. If it keeps moving, regulate it. And if it stops moving, subsidize it.

—Ronald Reagan

Logistics ... as vital to military success as daily food is to daily work.

—Captain Alfred Thayer Mahan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Aligning the Mission and the Need

Priority System

The Agency has been in the business of interpreting and analyzing data for more than 20 years. This is a difficult business because the Standard Base Supply System currently does not centrally store its data; instead it stores data at 180 different sites.

Captain Stephen D. Wier

All priorities are created equal…right? Wrong! The Department of Defense (DoD) has gone to great lengths to ensure that the Services have a wide-ranging priority system. There are five key elements that help determine the priority of a requisition. The elements are (1) a unit's force and activity designator (FAD), (2) the item's urgency-of-need designator (UND), (3) the item's military standard requisitioning and issue procedures (MILSTRIP) priority, also known as the supply priority; (4) the item's spares priority release sequence (SPRS) category; and (5) the item's transportation priority (TP). Now let's discuss each of these elements and how they relate to each other.

Force and Activity Designators

The first step in the priority system is determining a unit's FAD according to CJCSI 4110.01B, dated 18 January 2002.

The FAD defines the relative importance of a force, unit, activity, project, or program to accomplishing DoD objectives. The principal purpose of the priority system is to differentiate between the relative importance of competing needs. FADs are used in conjunction with urgency-of-need designators (UND) to establish a matrix of priorities used for supply requisitions.

The Joint Materiel Priorities and Allocation Board assigns these codes to forces, units, activities, projects, and programs, as well as foreign countries and their forces, units, or activities. Table 1 lists the various FAD codes and the key definitions for each code.

Urgency of Need Designator

The next step in determining the priority of an item is the unit's urgency of need. This urgency directly translates to a UND. The UND expresses the impact on operational mission capability because of materiel nonavailability.

There are three basic criteria used in determining the appropriate UND for a requisition:

- **A**: Shortage of materiel required for immediate end use precludes a force or activity from performing its assigned operational mission.
- **B**: Shortage of materiel required for immediate end use impairs a force or activity in performing its assigned operational mission.
- **C**: Projected future requirements, scheduled repair, maintenance, and manufacture; stock replenishment; and other routine shortages that do not meet UND A or B criteria.[2]

FAD	Definition
I	Forces, units, activities, projects, or programs that are most important to the military in the opinion of the Chairman of the Joint Chiefs of Staff (CJCS) and as approved by the Secretary of Defense (SECDEF). Programs which have been approved as a top national priority by the President or SECDEF.
II	Units (combat, combat support, or combat service support) engaged in or assigned to combat zone operations as specified by the CJCS or the supported combatant commander and approved by the SECDEF. Units (combat, combat support, or combat service support) designated to deploy in support of national security objectives within C+30 days when directed by National Command Authorities (NCA).
III	Units (combat, combat support, or combat service support) designated to deploy in support of national security objectives when directed by the NCA from C+31 to C+90. Units (combat, combat support, or combat service support) designated by the Service Chiefs and/or Commander, US Special Operations Command (COMSOCOM), or commanders of supporting combatant commands to prepare for deployment (for example, in possession of valid warning, alert, or prepare-to-deploy orders), in support of military operations as specified by a supported combatant commander or by the CJCS. Combat training units, to include combat or combat service support schools, supporting combat, combat support, or combat service support units designated to deploy in support of national security objectives, as designated by the Service Chiefs, COMSOCOM, or the commander of the affected combatant command. These units provide systemic instruction to individuals in subjects (air, land, or sea) that will enhance their knowledge and skills of the art of war and directly support FAD I and II operational requirements (for example, aircrews to support Single Integrate Operations Plan units and combat training centers).
IV	Units (combat, combat support, or combat service support) designated to deploy in support of national security objectives when directed by the NCA—C+91 and beyond. Units (combat, combat support, or combat service support) designated by the Service Chiefs to deploy in support of military operations, as specified by the combatant commands or the CJCS, or as required by the crisis action planning process. Combat training units supporting combat, combat support, or combat service support units as defined above. These units train the forces to respond to operational requirements deemed necessary by the Services (for example, military occupation specialty qualification, individual skills, and technical schools).
V	All remaining US forces, units, activities, projects, or programs.

Table 1. Definitions of Force Activity Designators[1]

There are many other criteria that would qualify a requisition for a particular UND, but those listed above illustrate that the UND is used to stratify a requisition based on its impact on the unit's mission accomplishment.

Priority Designator

The UND is used in conjunction with the FAD to determine the priority of each requisition. On every requisition, the priority designator (PD) indicates the relative importance of the request to a materiel support activity. The priority designator is used by the source of supply to determine many things such as how quickly to process the request, the mode by which the item should be shipped, and the order in which requisitions should be satisfied. These priority designators are defined in the DoD MILSTRIP regulation, DoD 4040.1 (Figure 1).

As shown in Figure 1, the combination of the FAD and the UND determines the priority designator to be used when a force or activity submits a requisition for an item. The figure also indicates the issue group and shipment time standards (for both continental United States (CONUS) and outside the CONUS (OCONUS) applied to requisitions based on the priority designator used. This system ensures that requisitions from the most important units (based on FAD) and most urgent requirements (based on UND) are identified as the highest priorities (lower priority designators) and are processed, released, and shipped more quickly than other requirements.

Assets required by Air Force units are typically classified as (1) consumable, lower cost items that are expended through use and not economical to repair and (2) reparable, higher cost items for which it is economical to repair. Generally, the Defense Logistics Agency (DLA) manages consumable items, while the Air Force Materiel Command (AFMC) manages reparables. The DLA uses the Uniform Materiel Movement and Issue Priority System (UMMIPS), which is based on MILSTRIP to prioritize the processing of requisitions and release of assets to satisfy them. For Air Force-managed items, AFMC utilizes the SPRS and Execution and Prioritization of Repair Support System (EXPRESS).

Uniform Materiel Movement and Issue Priority System

As mentioned earlier, UMMIPS is based on the MILSTRIP priority designators and is used by DLA and the other Services to determine which requirements get worked first. Within the various priority designators, requisitions are

further prioritized by various factors, the foremost being the requisition date. Typically, the oldest requisitions will be filled first. Other characteristics are considered, too, such as the required delivery date (RDD).

However, UMMIPS does not consider some very important factors, such as a unit's mission-capability status (for example, mission-capable rate for Air Force flying units), how many assets a unit has on hand compared to the number it is authorized, or the importance of the current contingency in which the unit is participating. For example, a PD 02 requisition to fill a spares kit will take precedence over a PD 03 that supports a Joint Chiefs of Staff (JCS)-project-coded unit employed in a contingency that has no assets on hand.

Spares Priority Release Sequence

Unlike DLA-managed items, the prioritization logic used for reparable items managed by AFMC is based first on the SPRS and then either UMMIPS or EXPRESS (Table 2).

The Air Force recognized that using UMMIPS alone did not meet the dynamic needs of aerospace combat units, so this additional prioritization scheme allows air logistics centers to be more responsive to mission-tasked Air Force requirements. By using a combination of factors—such as priority, project codes (for example, JCS project codes)—and whether there is a mission-capability condition, SPRS addresses a unit's operational mission, current operational tasking, and asset position to provide more effective support than UMMIPS. These SPRS categories are applied to all Air Force-managed reparable items, whether or not they are further managed with EXPRESS for repair or distribution.

Transportation Priority

The final step in determining a requisitions priority is determining its transportation priority. The criteria for each of the four transportation priorities are as follows:

- TP-1 (Expedite) is assigned to MILSTRIP and UMMIPS shipments with priority designators from 01 to 03, with any required delivery date or a blank RDD field. TP-1 also can be assigned to CONUS shipments that have 2 or fewer days remaining on the RDD or OCONUS shipments with 5 or fewer days remaining on the required delivery date.
- TP-2 (Expedite) is assigned to MILSTRIP and UMMIPS shipments with priority designator 04-15 and when the required delivery date is 777, 555, 444, N (not mission capable-supply [NMCS]), and E (anticipated NMCS) or an actual required delivery date is more than 2 but fewer than 8 days for CONUS shipments. For OCONUS shipments, the required delivery date is more than 5 days but fewer than 21 days.
- TP-3 (Routine) is automatically assigned to MILSTRIP and UMMIPS shipments when the supply priority is 04-15 and the RDD field is blank or has a Julian date that is more than 8 days for CONUS shipments or more than 21 days for OCONUS shipments. TP-3 also applies to non-MILSTRIP shipments when the RDD field is blank.
- TP-4 (deferred airfreight) is nonair-eligible materiel moving by military air on a space-available basis at or near the surface and sealift cost.[3]

With the many steps in the priority system, you can see that not all priorities are created equally. This system allows the services to requisition and move assets in a manner consistent with need and mission requirements. It is everyone's responsibility to ensure that the system is used properly, because when everything is a priority, nothing is a priority.

Notes

1. CJCSI 4110.01B, 18 Jan 02.
2. AFMAN 23-110, Vol I, Chap 24, 24.6.
3. AFI 24-201.

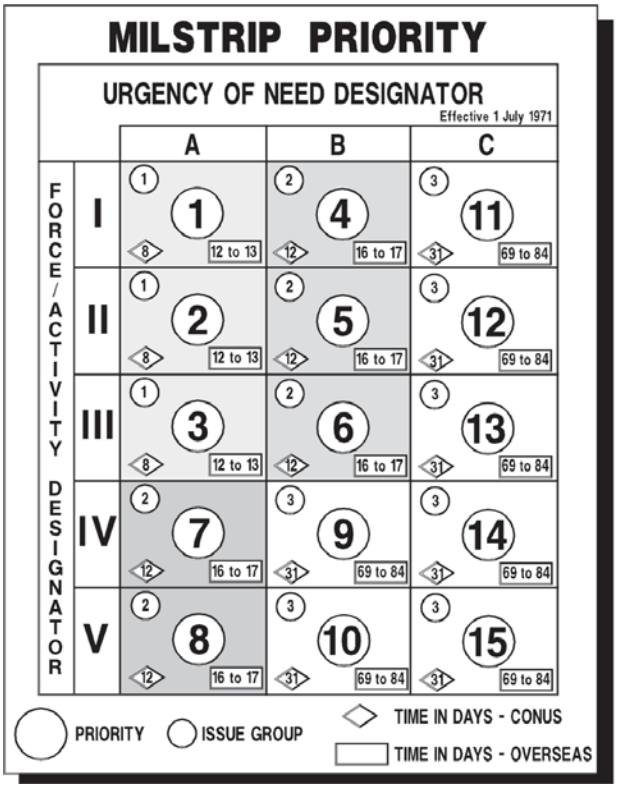


Figure 1. MILSTRIP Priorities

SPRS Category	Description
1	Priority 01 JCS Project Code MICAP
2	Priority 01 Non-JCS Project Code MICAP
3	Priority 01 All Other Back Orders
4	Priority 02-15 JCS Project Code MICAP
5	Project Code 700 MICAP
6	Priority 02-15 JCS Project Code RSP/CHPMSK/HPMSK
7	Project Code 700 Non-MICAP
8	Priority 02-15 Non-JCS Project Code MICAP
9	All Other Requisitions

Table 2. Spares Priority Release Sequence

The FCRSP proposal meets Air Force needs and will, for the first time, establish an accurate requirement based on the total wartime requirement down to the unit level. It provides requirement and asset visibility, has automated transfer and deployment procedures, provides the correct priority and project-coded replenishment requisitions, and eliminates redundant requirements. More important, it provides visibility to the theater commanders, the regional supply squadron, and you.

The New Flexible CRSP

Consumables Visibility

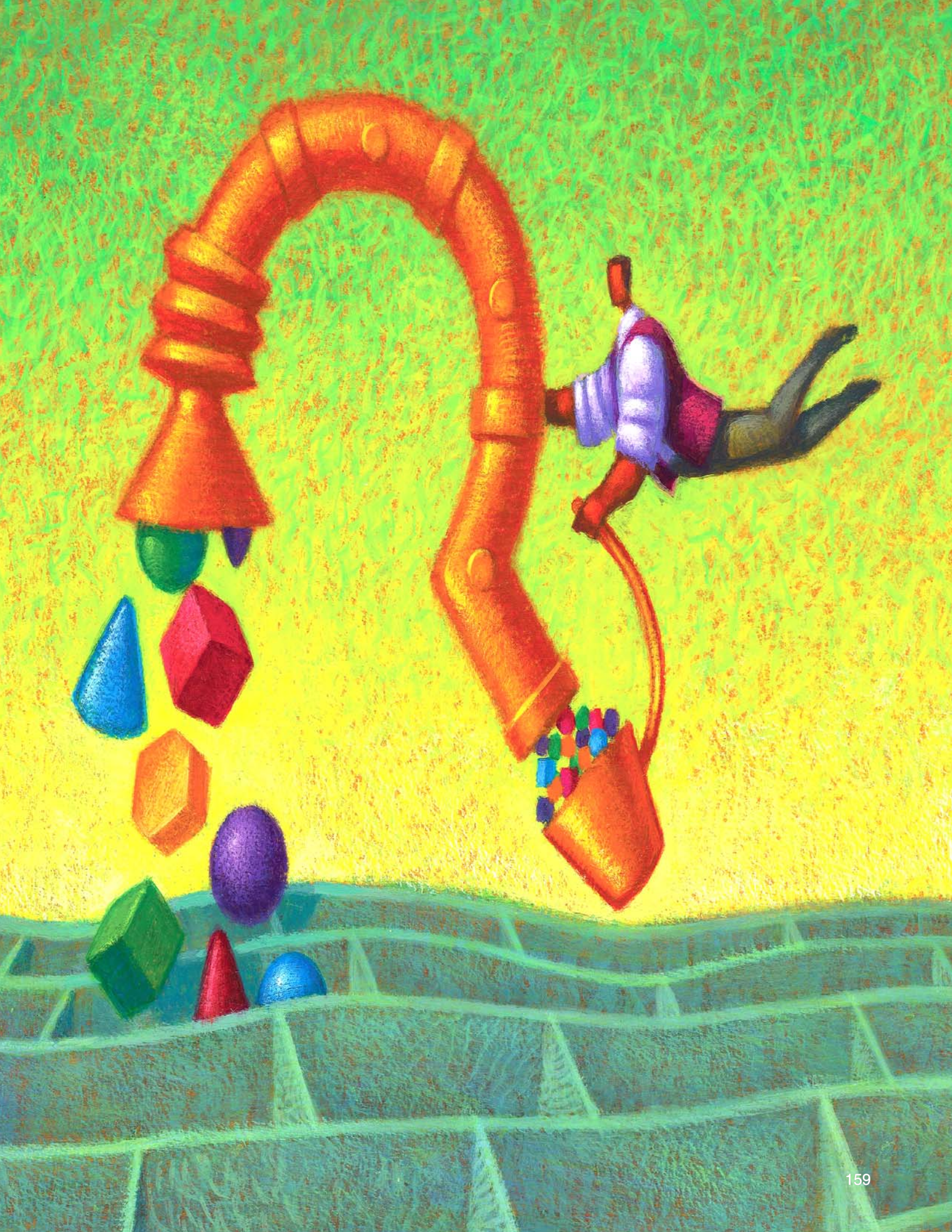
Chief Master Sergeant David R. Bridge

The new flexible CRSP provides visibility and a lot more.

If you have been in the Air Force for any period of time, you have deployed to many beautiful *vacation spots* around the globe. You pack up and deploy without your handheld terminals, computers, and fancy office equipment, not to mention a direct link to the Standard Base Supply System (SBSS) where you can look up any part in just seconds.

Now you find yourself in the middle of the desert with several pallets of aircraft spares and only a paper listing and a stubby pencil to keep track of the thousands of parts entrusted to you. Everyone you work with expects you to know where everything is and provide the same level of support received at home station. "How can I do it," you ask yourself. "At home station, there were hundreds of us, and now I am stuck here with little or no technology and working by myself." Not to mention every other unit that deployed brought everything it thought it might need, including the kitchen sink. Parts are stacked everywhere, and you know it will be very hard to keep track of just what you have, not to mention all the pallets of parts that every other unit brought and the thousands of bench-stock parts that were brought in suitcases, toolboxes, or by any means possible.

You have deployed before and know your real problem is lack of visibility of consumable parts; you know the cheap throw-away parts that seem



to occupy most of your time. You cannot believe it is the 45-cent part that has you running in circles trying to go mission capability or scrounge from home station. All you know is that there are consumable readiness spares packages (CRSP), mobility bench stocks (MBS), and deployable bench stocks (DBS) from every command in the Air Force. You name it, it's deployed. All you want is that one part, but it's a *consumable* and, therefore, not visible to you anywhere. You can account for the $5M parts, but the screws, nuts, gaskets, and bolts are lost in the sea of parts. No more, the flexible CRSP (FCRSP) is the solution for your problems.

Air Force Policy on Consumables

The Air Force policy for consumable item supply support during a contingency allows distinct methods—a CRSP, DBS, or MBS. There are advantages and disadvantages to all three. However, several different methods tended to complicate contingency operations, and the MBS, in particular, caused problems because of the lack of asset visibility in theater.

Budget and Accountability Issues

The Air Force Audit Agency cited deficiencies in the wartime consumable item support methods during an October 1997 audit. Auditors determined that CRSP and MBS authorizations exceeded the wartime requirement by at least $5.4M. Moreover, in some cases, the MBS did not contain all items needed to support deployed operations. In addition, the CRSP did not contain all items needed on deployment. In other cases, the CRSP had authorizations and quantities that were redundant with the MBS.

Where to Now?

Nearly 7 years after the audit, there is still no *one standard method* for contingency consumable item support. Some major commands (MAJCOM) and units build CRSPs, while others use DBS, MBS, or a combination of the methods.

Developing Criteria and Proposals

First, we developed the criteria for a good consumable supply support concept by trying to answer, "What should a good system do to provide contingency supply support?" We then compared the current CRSP, DBS, and MBS against the criteria developed. Our criteria had six mandatory and two preferred requirements. The mandatory requirements in a good system are automated requirements computation, levels based on wartime rates, asset and requirement visibility, automated transfer and deployment procedures, automated issue, and replenishment procedures. We had to eliminate the redundant requirements. In addition, we preferred optimization logic be applied and there be no stock fund impact as the parts would be sold directly to maintenance.

Improved Proposal—Flexible CRSP

Based on our criteria and MAJCOM comments, the FCRSP was developed, which provides the MAJCOMs the flexibility they require while still meeting our criteria for good supply support. The FCRSP will compute and load in-place readiness spares packages that detail the total wartime requirement (TWR) using wartime demand rates and pipeline times. For the first time ever, the TWR will be computed for consumables down to the unit level. The consumable kits can be segmented as required for deployments. The TWR rates can be computed by aircraft sustainability model to an aircraft availability or expected back-order target. Either option allows for addition of not optimized items.

The SBSS will use the readiness spares packages (RSP) priority and project code for all replenishment requirements up to the TWR. The base can segment the FCRSP into augmented (need to buy and include as part of the base requisitioning objective) and available (do not need to buy since assets are available in peacetime operating stock [POS] or bench stock). The augmented authorized level will be bought and stored in the FCRSP (RSP flyaway bins); the available stock will not be stored in the FCRSP in peacetime.

The FCRSP segments will accommodate three support options; they are FCRSP only, a combination of FCRSP and MBS, or just the MBS.

- **Option 1: FCRSP Only.** The base will deploy only the FCRSP. Then the base would make the FCRSP fully augmented and requisition to the TWR at the unit level, base level, or based on deployment needs.
- **Option 2: FCRSP and MBS.** The base chooses to deploy with its MBS plus additional levels of stock not authorized in a bench stock (for example, reparable and hazardous items). The augmented levels would be stored in the FCRSP. The FCRSP will include authorizations for a segment of available stock that are the levels available from POS stock and unit bench stocks. The FCRSP will only store items with augmented authorizations.
- **Option 3: MBS Only**. The entire FCRSP will be segmented into available stock. There is no need to order additional parts (all are available in bench stock), and no assets will be stored in the FCRSP. All POS replenishment actions up to the TWR will receive the applicable project code and higher contingency priority.

Usually, there is no POS level at a contingency location, and units using an MBS will create back orders to replenish their MBS. The contingency base can apply the priority urgency of need designator (Bx) and applicable project code to the back orders.

When a unit transfers to a contingency, it transfers the FCRSP for all three options! If it takes only the FCRSP (Option 1), the unit will transfer the authorizations and the stock and replenish using RSP procedures. If the unit takes only the FCRSP, it may robust the FCRSP. That is, the unit could change the available segment to be augmented and fill up the augmented authorizations with available home base (POS and bench stock). The contingency unit can change the available segment authorizations to be augmented at any time before or during the contingency.

If the unit takes both FCRSP and an MBS (Option 2), it will transfer all the FCRSP authorizations—both augmented and available. The augmented FCRSP assets will be transferred, and the unit will take its MBS (bench stock). Again, the deployed unit will receive the FCRSP replenishment priority and project code for all replenishments up to the TWR. Further, the unit can change the segments authorizations at any time to augmented and be supported from the FCRSP.

If the unit takes the MBS only (Option 3), it still transfers the FCRSP details, but they remain coded as available only. The deployed unit then will receive RSP priority and project code up to the TWR (the available authorization in the FCRSP) for all POS replenishments. The FCRSP details also will provide visibility of the requirement and provide *other asset notice* to theater commanders. Under this option, the FCRSP details provide automated asset visibility, project-coded requisitions (if authorized), and higher priority requisitions than MBS can provide.

The FCRSP concept not only best meets our criteria for a good contingency supply support concept but also accommodates all MAJCOM comments received on our previous proposals. It allows the flexibility for each MAJCOM to take a CRSP, an MBS, or some combination of both but makes the requirement and assets visible with the FCRSP details. Further, it automates transfer and replenishment procedures and allows the kits to be built (or segmented) when tasked.

The FCRSP proposal meets Air Force needs and will, for the first time, establish an accurate requirement based on the total wartime requirement down to the unit level. It provides requirement and asset visibility, has automated transfer and deployment procedures, provides the correct priority and project-coded replenishment requisitions, and eliminates redundant requirements. More important, it provides visibility to the theater commanders, the regional supply squadron, and you.

Business Booms When Combat Looms

CHPMSK

Although CHPMSKs only have been operational since 1998, they were employed with greater frequency during Iraqi Freedom than during any other period in their history.

Senior Master Sergeant Woodrow A. Parrish
Captain Daniel P. Johnstone

On 19 March 2003, the United States conducted its first airstrikes in support of Operation Iraqi Freedom. By 1 May, the US-led coalition had declared an end to major combat operations. How could the Air Force achieve such a quick and decisive military success? Obviously, there were many contributing factors, but one of the largest was the remarkable ability of the Air Force logistics community to keep up with the feverish pace of combat operations.

Long before our first bombs rocked Saddam's world, the logistical support pipelines were set in motion. For Air Force supply and maintenance troops, this meant preparing deployable aircraft spares kits and robusting supply support at contingency locations. Contingency support would be remarkably easy if the Air Force had unlimited resources. Unfortunately, it does not, so it must deploy critical spares wisely. One unique tool the Air Force supply community used judiciously to deploy critical spares to support the warfighter during Iraqi Freedom was the contingency high-priority mission support kit (CHPMSK).

A CHPMSK is a package of aircraft or equipment spares intended to support a long-term (more than 90 days) contingency operation. CHPMSKs are designed to support a particular weapon system but are not necessarily unit specific. They are used to complement a unit's readiness spares package (RSP) when additional spares are needed to provide a higher aircraft availability than the RSP, support base, or regional repair activity can provide. Unfortunately, CHPMSKs do not consist of additional spares that just magically appear. These kits contain high-

dollar, reparable items. To prevent the Air Force from buying additional, high-dollar spares, CHPMSK levels are taken from peacetime operating stock levels at units around the world. For example, if the United States Air Forces in Europe (USAFE) need to plus up levels to support certain F-16 engine components at a centralized repair facility supporting operations in Southwest Asia, the increase in USAFE levels will come at the expense of continental United States, Pacific Air Forces, or even USAFE peacetime operating stock levels.

Since CHPMSKs affect supply support worldwide, careful thought goes into their composition, and some objective analysis must be done to assess their impact. CHPMSK levels are not computed optimally. Initial levels are based on expected demands derived from past maintenance and supply experience. Obviously, deploying units want to include as many spares in the CHPMSK as possible to bolster support at the contingency location. However, each level approved for the CHPMSK is a level that another unit will be denied. Therefore, the requesting major command (MAJCOM) submits the computed CHPMSK to the Air Force Requirements Team (AFRT) at AFLMA for review. The AFRT analyzes the CHPMSK's impact on worldwide expected back orders for all requested reparable stock numbers and either recommends approval as is or works with the requesting MAJCOM to modify CHPMSK levels until the kit's impact falls within acceptable limits. The negotiated CHPMSK, along with the original CHPMSK request, is then forwarded to the Headquarters Air Force Materiel Management and Policy Division for final approval. Once approved, the contingency base is authorized to load the new CHPMSK levels, and they can begin requisitioning to fill their new authorizations.

Although CHPMSKs only have been operational since 1998, they were employed with greater frequency during Iraqi Freedom than during any other period in their history. In a 2-month span, the AFRT at AFLMA reviewed 25 kits from four different MAJCOMs for approval. These kits, contained 1,300 line items worth more than $130M and supported 19 different weapon systems at 14 contingency locations. How well did these kits support deployed units? Extremely well. In fact, more than 1,650 spares were issued from the CHPMSKs. Issues were made from the kits at all 14 locations, and 4 locations issued more than 100 spares from their respective CHPMSKs. In short, CHPMSKs provided Air Force logisticians the flexibility to stock critical reparable parts in the right places, at the right time.

Once major combat operations wound down for Iraqi Freedom, the requirements for these newly established CHPMSKs were reevaluated. As weapon systems returned to home station, certain kits were deleted, and their levels optimally reallocated to users worldwide. However, some CHPMSKs were not deleted because there was still a need for additional supply support at certain contingency locations. The Air Force will allow these kits to remain for a year before being reevaluated. By that time, the contingency locations should build up enough demand data to allow reparable spares levels to be optimally computed and equitably distributed across all users. This process is called normalization and will begin for several contingency locations in calendar year 2004.

During Iraqi Freedom, CHPMSKs proved invaluable in robusting supply support at numerous contingency locations. Since CHPMSK levels are not an additive requirement, careful analysis must be completed prior to approving each kit to ensure the levels do not disproportionately impact levels at other locations. MAJCOMs worked diligently with AFLMA to fine tune each kit's composition so the CHPMSKs could be fielded in record times. The CHPMSK approval and fielding processes were very successful and greatly contributed to the Air Force's success in Iraqi Freedom.

Change is not necessarily progress, but there can be very little progress without change.

—General Bruce K. Holloway, USAF

We look back on obstacles avoided and dangers overcome, on expectations more than realized and prosperity perfectly secured. To the hopes of the hostile, the fears of the timid, and the doubts of the anxious, actual experience has given the conclusive reply. We have seen time gradually dispel every unfavorable foreboding and our Constitution surmount every adverse circumstance dreaded at the outset as beyond control.

—Martin van Buren

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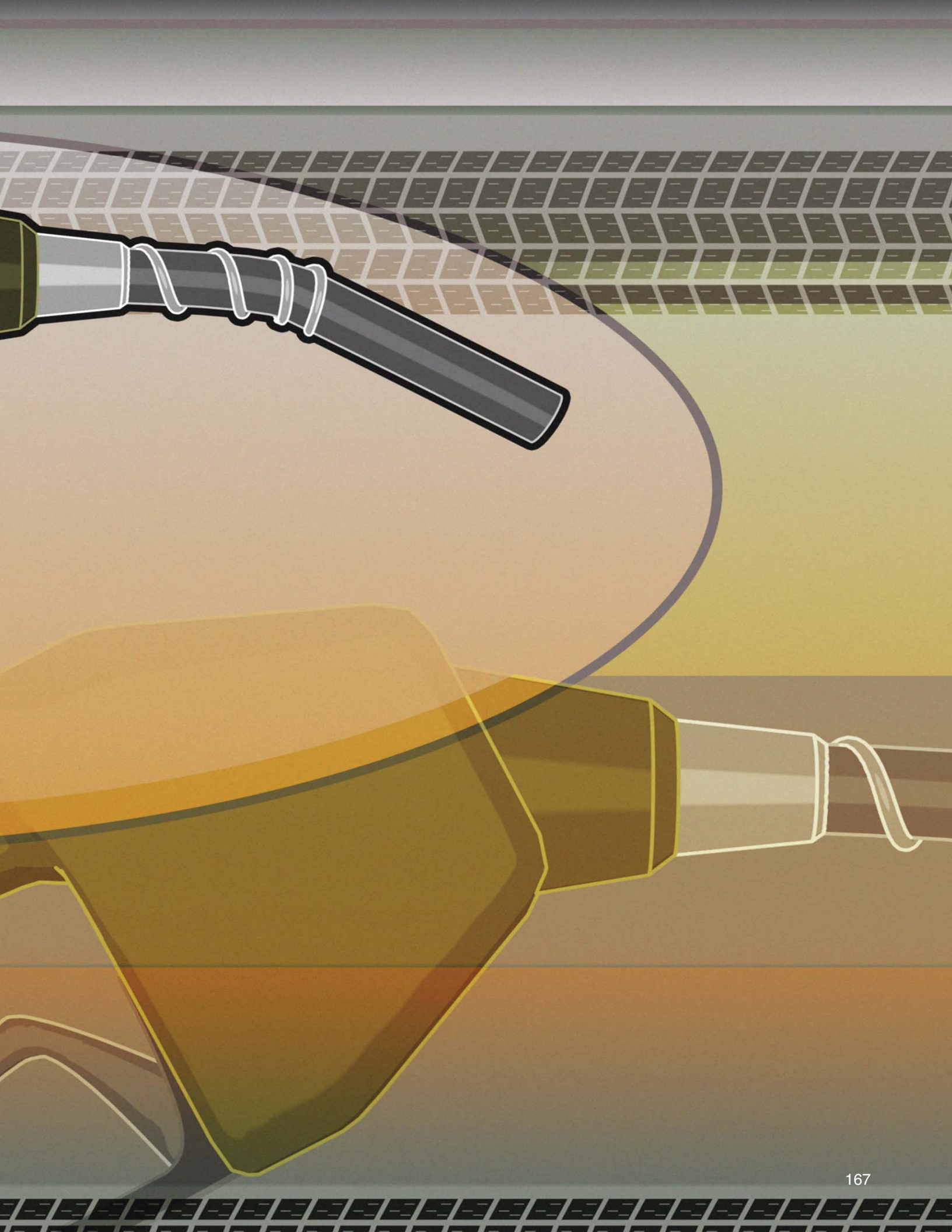
Fuels Mobility Support Equipment

A Better Way to Train

Senior Master Sergeant Robert A. McGonagle

Fuels mobility support equipment (FMSE), how important is it? To the fuels specialists, it is what separates them from the refueling operator at Logan Airport, Boston. FMSE gives the Air Force the capability to support all fueling operations anywhere in the world and under some of the most austere environments associated with war. FMSE, as we know it today, got its start during the Vietnam war, although other fueling systems were used as early as the 1950s during the Korean war.



Desert Storm would place the biggest burden on FMSE and test the capability like never before. Operating FMSE was an ever-changing process during the 12 years of Operation Southern Watch, and to compound things, the Air Force would go through a large drawdown, changing the way we deploy, with the introduction of the air and space expeditionary force (AEF) concept.

With the inception of AEF, the training provided to FMSE operators would come under scrutiny and prompt this study to determine the best and most cost-effective way to train fuels specialists for fueling operations in combat environments. The days of training on demand are over, and the need to provide mission-ready technicians is here.

FMSE is the primary refueling equipment used at bare bases in combat operations. Air Transportable Hydrant Refueling System (ATHRS) operations focus on ground refueling while Aerial Bulk Fuel Delivery System (ABFDS) operations focus on aerial delivery of petroleum products to forward operating locations. This study will examine the feasibility of merging the ATHRS portion of FMSE training into the 3-, 5-, 7-, and 9-level courses with the intent to provide all trainees with the basic knowledge to operate in a bare-base environment.

Facts

- Currently, the Air Force conducts all FMSE at MacDill AFB, Florida, and Yokota AB, Japan.
- Logistics readiness squadron commanders pay to send personnel to these courses to meet unit type code (UTC) requirements.
- Personnel assignment rotations put a constant strain on local budgets.
- The primary mission of the Air Force shifted to deployments; yet, Air Education and Training Command's (AETC) primary training focus is home-station skills.
- The expeditionary nature of the Air Force relies on every fuels person to perform grade-appropriate ATHRS tasks in a deployed environment.

Methodology

We conducted site visits with Headquarters Air Combat Command to gather course requirements to meet training standards. We also canvassed the fuels community looking for any past or ongoing problems, meeting the current operations tempo with qualified ATHRS-trained personnel. Last, we formulated the cost associated to move all related items at MacDill to Sheppard AFB, Texas, along with a cost-benefit analysis on training.

Site Visits

Visit to MacDill AFB and Sheppard AFB

The visit to MacDill focused primarily on ATHRS training. The director of the school expressed the need to keep ATHRS and ABFDS training collocated because of the interrelationship between the two. The instructors identified a number of items bearing on the potential hazards of separating the training and moving it to Sheppard.

A visit to Yokota was not required. This school is a scaled-down version of the MacDill school and is designed to teach only Pacific Air Forces (PACAF) personnel. All data needed for this study were provided by the PACAF fuels functional manger.

The visit to Sheppard focused on their ability to incorporate the training. Instructors provided a tour of the facilities and equipment available to conduct training.

Findings

FMSE schools provide vital training on ATHRS and ABFDS and are located at MacDill and Yokota. These schools are an integral part of warfighter training within the fuels career field. Combined, the schools train approximately 231 students on ATHRS and 49 students on ABFDS each year. The schools have the flexibility to train not only Air Force personnel but also foreign students and officers on special occasions. They also have conducted onsite training for entire units. Furthermore, housed at MacDill and Yokota are the continental United States and PACAF FMSE storage areas, respectively. Having these units collocated provides the school with free use of equipment.

The basic fuels apprentice school at Sheppard trains an average of 900 students to the 3- and 5-skill level and 400 students to the 7-skill level. Combined, students receive only 15 hours of training on FMSE, far below the 104.5 hours provided in the current ATHRS and ABFDS courses. The 15 hours taught do not provide a sufficient level of knowledge to meet current UTC requirements, thus requiring additional training.

The basic fuels apprentice school relies on contracted support for maintenance on refueling equipment. A modification to the current maintenance contract would be required to maintain the additional refueling equipment needed to conduct training. The school has adequate classroom space to accommodate the student throughput currently at MacDill and Yokota.

The current method of training fuels personnel is meeting the mobility requirements for each of the MAJCOMs. No shortfalls or limiting factors have been identified with a lack of FMSE-trained personnel as a contributing factor.

Because funding currently is provided at the unit level, units must forecast funds according to future requirements for FMSE-trained personnel to fill wartime taskings. All available training slots are distributed throughout each of the MAJCOMs, often leaving bases short of their requested training requirement. Training at this time is done on an as-needed basis to meet mobility commitments.

Cost Breakdown

Costs Associated with Training at Sheppard AFB

The fuels schoolhouse will incur significant startup costs to incorporate effective FMSE training in the current curriculum. The recommended equipment required to conduct FMSE training totals $5.6M. However, this cost would be incurred only if new equipment were purchased. The current plan is to redeploy assets from current contingency operations to Sheppard. Also, excess equipment could be transferred to meet this need. Other costs associated with startup are temporary duty costs to send two instructors from Sheppard to MacDill for training and tools required by the contractor currently providing maintenance services for all fuels equipment. Table 1 lists the anticipated startup costs for Sheppard.

Additionally, the annual operating costs at Sheppard will increase by an estimated $235K because of an increase to the maintenance contract and reproduction of class materials. As stated earlier, the MacDill and Yokota schools use equipment maintained by the FMSE war reserve materiel sections located at each base, thus incurring no cost for maintenance of the equipment.

Current Cost to Conduct FMSE Training

The FMSE school at MacDill is the point of contact for the curriculum and provides guidance to the Yokota school. Operational costs illustrated are for the school at MacDill only. Yokota maintains only a small school to meet PACAF requirements and is controlled functionallyby the Logistics Readiness Squadron Fuels Management Flight.

Equipment needed minus equipment on hand	$5,248,447.95
TDY cost for two instructors	$6,926.00
Contractor tools	$50,000.00
Total Startup Cost	**$5,305,373.95**

Table 1. Sheppard AFB Startup Costs

In Table 2, the annual costs to operate current training are broken down into two separate sections. The first section is the annual operating cost at MacDill. The second section shows the student cost based on the average student load per year at both MacDill and Yokota.

Methods of Training

To calculate the per-student training cost at Sheppard, we broke down the training into three available methods: integrated, follow-on, and advanced training.

- Integrated training will incorporate ATHRS tasks into the current 3-, 5-, 7-, and 9-level courses.
- Follow-on training would take place after completion of the basic apprentice or craftsman courses. Three-level students would attend ATHRS training, and select 7-level students (approximately 49 per year) would attend ABFDS training.

Advanced training would have the ATHRS and ABFDS courses operate as they are now at MacDill, as a separate specialized course relocated to Sheppard AFB.

Tables 3 through 7 illustrate potential scenarios, using a combination of available training methods, to conduct FMSE training, along with the associated cost. The numbers of students trained are a combination of current and projected requirements. Integrated and follow-on ATHRS training reflects the current average of 900 3-level and 400 7-level students per year. These figures were used for follow-on because of the impossibility in determining which students would receive ATHRS and which would not and still meet the ATHRS requirements of each base.

Training Scenario One

The concept of this scenario (Table 3) is to provide a phased ATHRS training process and train only those tasks required for a particular skill level. The 900 students that complete the 3- and 5-level training will possess the ability to deploy without the need for additional training. The 400 students completing 7-level training will become certified ATHRS operators. The ABFDS course would be taught as an advanced course with student load dictated by actual unit requirements.

Reproduction of class materials	$4,000.00
3 Computers @ $5,400.00 every 3 years	$1,800.00
3 Printers @ $1,200.00 every 5 years	$240.00
1 Projector @ $15,000.00 every 10 years	$1,500.00
1 GS11 (STEP 6)	$54,965.00
1 E6/TSGT	$62,571.00
1 E5/SSGT	$53,439.00
1 E4/SrA	$44,332.00
Total Operating Cost	**$222,847.00**
Student costs: MacDill AFB ATHRS – 220 @ $2,281.97, ABFDS – 30 @ $1,471.97 Yokota AB ATHRS – 11 @ $1,500.00, ABFDS – 19 @ $1,000.00	$581,692.50
Total Annual Cost to Conduct FMSE Training	**$804,539.50**

Table 2 Current Cost to Train FMSE

Method of Training	Number of Students	Cost
Sheppard AFB		
ATHRS integrated into 3-, 5-, 7-, and 9 level courses.	3-, 5-level – 900 7-level - 400	$0.00
ABFDS as a advanced course	49	$91,140.00
Operating costs		$235,000.00
Total Cost to Train at Sheppard AFB		**$326,140.00**
Current training cost at MacDill AFB and Yokota AB (Table 1)	ATHRS – 231 ABFDS – 49	$804,539.50
Cost Difference for Scenario 1		**$478,399.50**

Table 3. Training Scenario One

Method of Training	Number of Students	Cost
Sheppard AFB		
ATHRS integrated into 3-, 5-, 7-, and 9-level courses.	3-, 5-level – 900 7-level - 400	$0.00
ABFDS as a follow-on course to 7-level course	49	$29,155.00
Operating costs		$235,000.00
Total Cost to Train at Sheppard AFB		**264,155.00**
Current training cost at MacDill AFB and Yokota AB (Table 1)	ATHRS – 231 ABFDS – 49	$804,539.50
Cost Difference for Scenario 2		**$540,384.50**

Table 4. Training Scenario Two

Method of Training	Number of Students	Cost
Sheppard AFB		
ATHRS as follow-on to 3-level course	3-level – 900	$1,003,340.00
ABFDS as an advanced course	49	$91,140.00
Additional operating costs		$235,000.00
Total Cost to Train at Sheppard AFB		**1,329,480.00**
Current training cost at MacDill AFB and Yokota AB (Table 1)	ATHRS – 231 ABFDS – 49	$804,539.50
Cost Difference for Scenario 3		**$524,940.00**

Table 5. Training Scenario Three

Method of Training	Number of Students	Cost
Sheppard AFB		
ATHRS as follow-on to 3-level course	3-level – 900	$1,003,340.00
ABFDS as a follow-on course	49	$29,155.00
Additional operating costs		$235,000.00
Total Cost to Train at Sheppard AFB		**$1,267,495.00**
Current training cost at MacDill AFB and Yokota AB (Table 1)	ATHRS – 231 ABFDS – 49	$804,539.50
Cost Difference for Scenario 3		**$462,955.50**

Table 6. Training Scenario Four

Method Of Training	Number of Students	Cost
Sheppard AFB		
ATHRS as an advanced course	231	$773,388.00
ABFDS as an advanced course	49	$91,140.00
Operating costs		$235,000.00
Total Cost to Train at Sheppard AFB		**$ 1,099,528.00**
Current training cost at MacDill AFB and Yokota AB (Table 1)	ATHRS – 231 ABFDS – 49	$804,539.50
Cost Difference for Scenario 5		**$294,988.50**

Table 7. Training Scenario Five

Training Scenario Two

In this scenario (Table 4), the ATHRS training will be integrated as described in scenario one (Table 3). However, the ABFDS course now will be conducted as a follow-on course. Select students completing 7-level school will attend the ABFDS course after successfully completing the 7-level course.

Training Scenario Three

In scenario three (Table 5), ATHRS training is taught as a follow-on course for the 3-level students. However, because of the large number of students, all 900 students would have to attend the course to ensure units receive the adequate number of qualified operators to meet mobility requirements. The ABFDS course would be taught as an advanced course with student load dictated by actual unit requirements.

Training Scenario Four

With this scenario (Table 6), ATHRS is taught as a follow-on course to the 3-level students. No additional ATHRS training would be required after completion of the course. Again, because of the large number of students, all 900 students would have to attend the course to ensure units receive the adequate number of qualified operators to meet mobility requirements.

Training Scenario Five

In this scenario (Table 7), both ATHRS and ABFDS courses would be taught as advanced courses. Students would attend on an as-needed basis to meet current mobility commitments at each unit. This scenario mirrors the MacDill and Yokota schools.

Cost Per Student

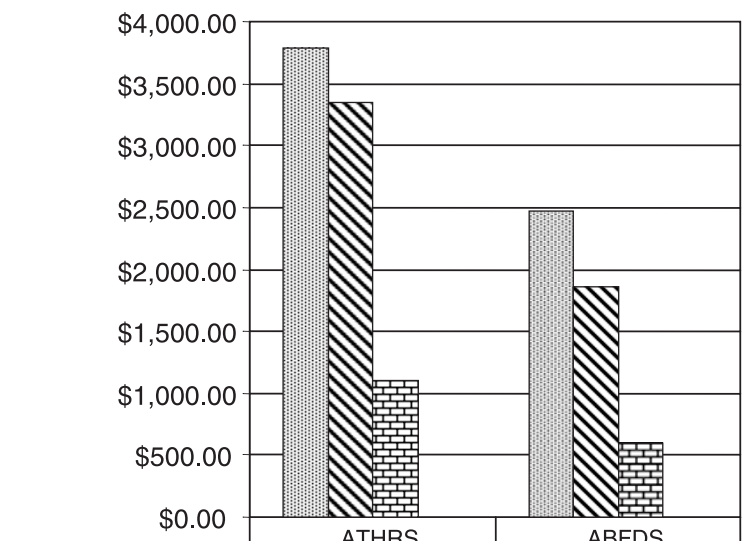
Figure 1 identifies the cost per student for each method of training associated with the location. The cost for Yokota was provided by PACAF and is an average, not a detailed, cost breakdown.

Conclusions

The fuels apprentice school has adequate space, both classroom and real property, to handle the incorporation of ATHRS training. Seventy-eight and a half academic hours are available within the 3- and 7-level courses to handle the current training requirement.

Conducting the ATHRS and ABFDS training at Sheppard will cost the Air Force an additional $326K per year while the MacDill and Yokota schools remain open. However, should Sheppard become the only FMSE training site, the Air Force would save up to $540K per year and provide every fuels troop completing AETC courses grade-appropriate training on FMSE. This represents 4.5 times the number of students receiving grade-appropriate training, qualifying them to fill certain UTC requirements.

The fuels schoolhouse currently does not have sufficient FMSE equipment to conduct classes. The cost to obtain the needed equipment is $5.2M with a payback of 10 years (worst case). A new equipment list that matches the proposed training plan will provide actual requirements.



	ATHRS	ABFDS
Train at MacDill and Yakota	$3,781.97	$2,471.97
Train at Sheppard as Advanced Course	$3,348.00	$1,860.00
Train at Sheppard as Follow-on Course	$1,105.00	$595.00

Figure 1. Cost Comparison Per Student

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The Agency's command staff have broad and extensive logistics, functional area, or analysis experience—in many cases 20 or more years. They support four product divisions (Contracting, Maintenance, Supply, and Logistics Readiness), the Analysis Division, Office of the Air Force Journal of Logistics, and day-to-day operations.

The computer support staff manages and maintains AFLMA's computer hardware, software, and databanks and assists in developing estimates of potential savings or cost avoidance associated with projects. Contractor personnel provide a wide range of support to the Agency. This support falls into two major areas: inventory and supply chain management (Logistics Management Institute) and wargames and exercises (Synergy).

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Project Management Staff

Each project manager is a functional expert in his or her discipline. When a project is accepted for study, the project manager assembles a cross-functional team to study the problem. Together, the functional experts and analysts ensure project results are sound, logical, and practical. Additionally, this approach helps prevent functional suboptimization. As part of the project effort, the project manager regularly updates the organization or activity that proposed the study, along with the project sponsor.

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Analysis Staff

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AFLMA projects begin with a written request from a project sponsor. The appropriate division chief assigns a project manager (PM), who prepares a letter of acknowledgment for the commander's signature and conducts a preliminary analysis to determine if the problem has already been solved, is currently being studied by another agency, or should be taken on by AFLMA. Division chiefs assign team members to the PM, and the team develops a plan to document project background, objectives, milestones, and methodology. After the preliminary analysis is completed, the team holds an initial project review to inform the commander and division chiefs about the project. If the commander approves the project, the project team studies the issue, documents findings, and formally presents them at a final project review. Based on comments received during the review, the project team makes the necessary changes to the final report and prepares it for publication, distribution, and archiving.

Contracting

Commodity Council Lessons Learned and How-to Recommendations
LC200228804—Consulting Study

Provides a clear, succinct, and easy-to-read *roadmap* for the lessons learned from the first Air Force Council for information technology products and services.
MSgt Aaron A. Kelly, DSN 493-0969

Enterprise Architecture for Procurement Organizational Process Change Impact Analysis
LC200328805—Consulting Study

Analyzes data (contracting job types and number of positions in *as is* and the perceived *to be* environments) and then examines the differences.
Maj Michael Knipper, DSN 493-0895

Enterprise Resource Planning Market Research
LC200316701—Consulting Study

1. Provides contracting expertise during the evaluation of various vendor software to determine if the software will handle contracting transactions.
2. Ensures the effort adheres to the constructs of a vendor demonstration and does not resemble a source selection evaluation.

Lt Col Kim C. Triesler, DSN 493-0892

Conferences, Training, and Consulting Support
LC200300700—Consulting Study

Provides support for conferences, training activities, and general consulting efforts.
Lt Col Kim C. Triesler, DSN 493-0892

Contracting to Support Contingencies: Lessons from Recent Operations
LC200401600—Consulting Study

In partnership with RAND, provides analysis of lessons learned from recent operations.
Lt Col Kim C. Triesler, DSN 493-0892

Logistics Readiness

Analysis of TP1/999 Shipments in the Air Mobility Command (AMC) System
LT200301300—Improvement Study

1. Identifies applicable guidance that stipulates criteria for prioritizing cargo in the Defense Transportation System.
2. Determines ship times for mission-capability items and other TP1/999 shipments in the AMC system.
3. Proposes new business rules for prioritizing TP1/999 cargo that are consistent with operational needs.

Capt Jason L. Masciulli, DSN 493-0931

Ramstein Superhub LT200311800—Improvement Study

1. Identifies strategic distribution improvement opportunities to maximize efficiencies at Ramstein AB, Germany.
2. Proposes solutions to improve the process.

MSgt Daniel J. Bender, DSN 493-0937

Space-Available Travel System Potential Capacity Analysis LT200316702—Improvement Study

1. Determines the number of passengers current manning and infrastructure can handle in a 24-hour period at representative passenger terminals.
2. Identifies instances where destinations prohibit space-available travel, even when capacity exists.
3. Provides actual number of seats that have been available to space-available passengers for the last 5 to 7 years annually at Air Mobility Command (AMC) terminals.
4. Plots the number of passengers by AMC terminal and by month based on historical data.
5. Examines current population figures for active duty, disabled veterans, military widows, family members (of active and retired), retirees, and Department of Defense civilians.
6. Determines growth trends for all categories to identify the potential eligibility pool population.
7. Determines how the proposed Patriot Express reduction will impact capacity.

Capt Frank W. Watson, Jr, DSN 493-0929

Global Logistics and Mobility Game 2003 LX200305006—Consulting Study

1. Allows for indepth analysis of items not typically addressed in Title X wargames.
2. Used scenario and logistics data from Global Engagement VI to identify problem areas in support of operations.

Capt Joseph B. Skipper, DSN 493-0923

Enduring Look LX200128500—Consulting Study

Compiles lessons learned from the air war over Afghanistan.

Maj Donald Hinton, DSN 493-0917

Focused Logistics Wargame 03 LX200212901—Consulting Study

1. Develops and assesses technological breakthroughs, joint logistics doctrine, and desired operational capabilities required to meet the JV 2020 Logistics Challenges.
2. Investigates US and coalition ability to effectively and efficiently support military operations in light of the demands of homeland security, global war on terrorism, and other posture-of-engagement activities.

Capt Joseph B. Skipper, DSN 493-0923

Global Engagement VII LX200327602—Consulting Study

1. Explores and refines *persistent dominance* as an operational concept in contributing to future joint warfighting.
2. Explores and develops the Air Force global persistent attack concept-of-operations (CONOPS) contribution to future joint warfighting.
3. Explores the contribution of the Air Force Space and C4ISR CONOPS to enable *decision superiority* for the joint forces commander.

Capt Joseph B. Skipper, DSN 493-0923

The Agency conducts three kinds of study and analysis efforts:

1. Improvement Studies. Target specific problems, issues, or questions; improve existing processes; develop new processes or programs; develop prototype software; and develop and create training and job aids (handbooks, users' manuals, or guides).

2. Consulting Studies. Focus on monitoring an activity or acting in an advisory capacity to another organization.

3. Requirements Team Studies (supply only). Focus directly on improving the systems used to manage Air Force spares.

Maintenance

Follow-on Technical Support for Weapons Load Crew Management Program LM199812000—Consulting Study

1. Ensures the Weapons Load Crew Management Program is exploited to its fullest extent.

2. Ensures all users are knowledgeable about the program's capabilities and features.

SMSgt Eric W. Pickett, DSN 493-0896

Support Web Site for Munitions CD-ROM LM199924500—Consulting Study

Supports the Ogden Air Logistics Center's Air-to-Surface Munitions Directorate in maintaining the *Senior Air Force Leaders Munitions CD-ROM* as an official-use-only Internet site.

SMSgt Eric W. Pickett, DSN 493-0896

F101 Engine Regional Repair Center Cost-Benefit Analysis LM200226800—Improvement Study

1. Compares quantitative and qualitative factors to determine whether F101 engine intermediate repair should be conducted at McConnell AFB, Kansas, or Dyess AFB, Texas.

2. Provides decisionmakers detailed costs and benefits for peacetime and wartime operation.

Capt James A. MacKenna, DSN 493-0900

Low-Observable (LO) Maintenance Manpower Study LM200215100—Improvement Study

1. Determines how best to structure, manage, and sustain requirements and training for the 2A7X3 career field.

2. Focuses primarily on current and future LO maintenance manpower requirements.

Maj Steven A. Oliver, DSN 493-0883

Cost-Benefit Analysis (CBA) of Warranties for Support Equipment (SE) LM200300701—Improvement Study

1. Reduces SE down time and warranty program utilization costs at overseas locations by adding specific requirements to contracts.

2. Reduces military use-related issues with commercial off-the-shelf procured SE items by evaluating warranties after the operational test and evaluation phase of the acquisition process.

3. Recommends use of Warner-Robins Air Logistics Center warranty tracking system to improve identification and processing of warranty parts and helps prevent costs associated with misidentification.

4. Provides the ability to analyze costs associated with warranty programs and perform CBA using a single data source.

MSgt Brian K. Millett, DSN 493-0876

Maintenance Manpower Authorization Assessment LM200305007—Consulting Study

1. Establishes objective criteria for evaluating maintenance and munitions authorizations for possible conversion in support of the Air Force-directed maintenance reengineering effort.

2. Identifies for major command functional managers validation-specific positions that do not meet the criteria.

Capt Steven A. Oliver, DSN 493-0883

Condition-Based Maintenance Plus Initiative LM200301800—Improvement Study

1. Establishes a condition-based maintenance definition, identifying enabling technologies for the Air Force.

2. Provides an implementation roadmap with suggested changes to capability planning, acquisition, and maintenance regulations.

Capt Timothy A. Smith, DSN 493-0894

Air Force Mission-Capable Rate and Aircraft Availability Model Study LM200301600—Consulting Study

1. Documents the requirements for an Air Force model capable of forecasting mission-capable rates, aircraft maintenance production capability, and aircraft availability.

2. Provides recommendations for an implementation roadmap designed to establish the proper framework for the development and management of logistics modeling and simulation tools.

Capt Kirk Pettingill, DSN 493-0884

Exploiting Automatic Identification/Serialized Tracking Technology LM200304100—Improvement Study

1. Evaluates the effectiveness of the Depot Reparable Information Local Server and Lean Depot Management System in using serial number tracking to reduce costs.

2. Assists in building the program objective memorandum submission for FY06 and to lobby for the support of other major commands.
Capt Steven A. Oliver, DSN 493-0883

Update and Upgrade the *Munitions Manager's Reference Guide*
LM200300600—Improvement Study

Provides a reference guide designed to provide senior NCOs and junior officers with a readily available reference that outlines the most common tasks a munitions manager will face in the munitions storage area.
SMSgt Eric W. Pickett, DSN 493-0896

Support to RAND for CONUS Centralized Intermediate Repair Facility (CIRF) Implementation Study
LM200327600—Consulting Study

1. Assists RAND in developing criteria, researching data, and briefing results on CONUS CIRF options for F-15 avionics and F110/100/TF34 engines and pods.
Capt James A. MacKenna, DSN 493-0900

USAF Unmanned Aerial Vehicle (UAV) Maintenance Manning
LM200326700—Improvement Study

1. Determines which Air Force specialty codes (2A, 2E, and 2M) are best-suited to perform UAV maintenance.
2. Develops a list of potential options that address the best mix of skill sets to perform UAV maintenance using various decision support tools and recommends the best options.
Capt Timothy A. Smith, DSN 493-0894

Management of Cartridge- and Propellant-Actuated Devices (CAD/PAD)
LM200326800—Improvement Study

1. Determines, from the Air Force standpoint, the best process for managing Air Force CAD/PAD items.
2. Provides decisionmakers with detailed costs and benefits for managing CAD/PAD, either as a munitions item or a supply item.
SMSgt Eric W. Pickett, DSN 493-0896

Supply

Enterprise Data Warehouse Functional Requirements
LS200312801—Improvement Study

1. Identifies the functional requirements that the Enterprise Data Warehouse should and should not fulfill for Air Force Supply in the future.
2. Identifies data and attributes of data to accomplish functional requirements.
3. Includes a requirements document that develops a roadmap to prioritize data warehousing and data analysis.
Capt G. Scott Webb, DSN 493-0910

Study of Alternative Demand Data Sources for Computing Readiness Spares Package (RSP)
LS200312200—Requirements Team Study

1. Compares alternative failure data (7SC versus R54 versus D200A).
2. Determines accessibility and usefulness of the 7SC database.
3. Recommends whether to use 7SC data for RSP computations.
Ms Angela D. Laskey, DSN 493-0912

Assessing Retail Customer-Oriented Leveling Technique (COLT) Implementation Part III: Assessment of COLT Test
LS20033603—Improvement Study

1. Documents changes needed before retesting COLT.
2. Assesses the performance of COLT.
3. Compares COLT performance with current consumable leveling methods.
Capt Daniel P. Johnstone, DSN 493-0933

Proof-of-Concept Testing for Automating the Update Process to the Weapon System Support Program (WSSP)
LS200303700—Improvement Study

1. Documents processes and business rules used to conduct the Air Force WSSP proof-of-concept test.
2. Analyzes and interprets results of the test.
3. Provides information necessary for the Air Force Materiel Management Board to determine whether to implement the revised WSSP update process for all Air Force weapon systems.
Capt Stephen D. Wier, DSN 493-0942

Procedures for Contractor Inventory Control Points to Set Base Levels
LS200300815—Improvement Study

1. Explains the readiness-based leveling (RBL) concept and input and output transactions.
2. Identifies what steps the contractor should take to obtain the appropriate RBL code and documentation sources so the contractor can remain current.

Capt Daniel P. Johnstone, DSN 493-0933

Impact of Force Activity Designator (FAD) Code Changes on Air Education and Training Command (AETC) Supply Support: Part II
LS200330800—Improvement Study

1. Determines the impact of lower FAD codes on parts availability.
2. Determines if this impact affects AETC flying training units' mission capability.

Capt Stephen D. Wier, DSN 493-0942

Develop Method to Prioritize Equipment Buy, Repair, and Distribution
LS200300715—Improvement Study

1. Determines an objective function that will determine relative success of Air Force equipment buys.
2. Develops business logic to prioritize execution decisions for equipment buys.
3. Demonstrates improvement of the recommended logic over the current system.
4. Recommends implementation procedures for new business logic.

Capt G. Scott Webb, DSN 493-0910

Intransit Data Accuracy
LS200233900—Requirements Team Study

1. Identifies extent of dirty data in the Air Force intransit program.
2. Identifies impact of these data.
3. Recommends policy and technology to improve quality of intransit data.
4. Recommends improvements to reconciliation process to find *lost* transactions
5. Recommends policy for when to use intransit data in Execution and Prioritization of Repair Support System.

Capt G. Scott Webb, DSN 493-0910

Air Force Total Ownership Cost-Data Feed
LS200210200—Consulting Study

1. Provides, on a monthly basis, all Air Force retail supply transactions not currently provided by the Standard Base Supply System (SSBS) D40 report.
2. The AFLMA Supply Division will provide the necessary monthly transactions until the Standard Systems Group accomplishes necessary program changes to the SBSS.

TSgt Ronald J. Berthelette, DSN 493-0924

National Stock Number Issue and Stockage Effectiveness (IE/SE) (Phase Four)
LS200205600—Consulting Study

1. Captures all retail supply demands, managed by the air logistics centers, required to compute IE/SE.
2. Stores the transactions in an Enterprise relational database and maintains a minimum of 3 years.
3. Develops Web applications to compute IE/SE.
4. Develops capability for users to access the applications via the Internet.

MSgt Michael C. Shilling, DSN 493-0938

Air Force Regional Stockage Policy Opportunities—Part II: Proactive Demand Forecasting
LS200203001—Improvement Study

Identifies opportunities to improve Air Force supply support by evaluating proactive demand forecasting of Air Force stock levels.

Capt Stephen D. Wier, DSN 493-0942

Air Force Customer Wait-Time Metrics Support
LS200202901—Consulting Study

1. Provides, on a monthly basis, all Air Force retail supply transactions required to compute customer wait time.
2. AFLMA will provide a monthly transaction file until Standard Systems Group accomplishes necessary program changes to the Standard Base Supply System.

MSgt Michael C. Shilling, DSN 493-0938

Air Force Supply Data Bank
LS200201400—Consulting Study

Maintains a historical database of selected supply data for use in accomplishing approved projects.

MSgt Michael C. Shilling, DSN 493-0938

Air Force Spares Budget Requirement
LS200101801—Consulting Study

Determines if the Requirements Management System (D200A) can be used as the single source of spares requirements for the Air Force.

SMSgt William T. Gilreath, DSN 493-0938

Support for Fuels Personnel on Flying Status LS200325101—Improvement Study

1. Determines the proper levels of medical, equipment, and training support necessary for Aerial Bulk Fuels Delivery System (ABFDS) and forward area rearm and refuel point (FARP) personnel to perform their assigned duties.
2. Determines whether or not ABFDS and FARP personnel should deploy on aeronautical orders.
3. Determines the best way to budget for expenditures (flying hours and so forth) as a result of the recommendation.
4. Identifies changes necessary in current Air Force instructions to allow consistent application of the appropriate policy guidance across all major commands.

MSgt Daniel Fenton, DSN 493-0932

Reconciliation of Air Mobility Command (AMC) In-Place Readiness Spares Package (IRSP) Adjusted Stock Levels (ASL) LS200334600—Requirements Team Study

Ensures AMC IRSP ASL records are loaded correctly in readiness-based leveling.

SMSgt Woodrow Parrish, DSN 493-0930

Centralized Intermediate Repair Facility (CIRF) Logistics Readiness Concept of Operations (CONOPS) LS200316700—Improvement Study

1. Identifies the issues and alternatives for CIRF procedures, including a review of existing CIRF procedures.
2. Recommends improvements in the CIRF materiel management and distribution processes.
3. Develops a standard for CIRFs that repair spares and include major command comments.
4. Identifies actions and recommendations needed to implement CIRF CONOPS.

CMSgt David Bridge, DSN 493-0920

Measuring the Impact of Consumable Item Normalization LS200328802—Improvement Study

1. Determines whether or not normalizing consumables for long-term deployment locations is in the best interest of the Air Force.
2. Develops business rules and system changes necessary to make the process work.

Maj Kevin J. Gaudette, PhD, DSN 493-0944

Review of Readiness-Based Leveling Logic (RBL) Used to Assign Problem Item Flags LS200333500—Requirements Team Study

Makes necessary adjustments to the RBL logic and all documentation so the original intent of each problem item code is met and accurately documented.

SMSgt Woodrow Parrish, DSN 493-0930

Active Projects Supporting Expeditionary Airpower/Agile Combat Support

- **Analysis of TP1/999 Shipments in the Air Mobility Command System**

  LT200301300—Improvement Study
- **Ramstein Superhub**

  LT200311800—Improvement Study
- **Global Mobility Game 2003**

  LX200305006—Consulting Study
- **Evaluation of Recent Deployments of Expeditionary Medical Assets**

  LX200310702—Improvement Study
- **Global Engagement VI**

  LX200109200—Consulting Study
- **Air Force Mission-Capable Rate and Aircraft Availability Model**

  LM200301600—Consulting Study
- **Study of Alternative Demand Data Sources for Computing Readiness Spares Package**

  LS200312200—Requirements Team Study
- **Develop Method to Prioritize Equipment Buy, Repair, and Distribution**

  LS200300715—Improvement Study
- **Analysis of Bench Stock Support for Home Station and Contingency Operations**

  LS200300702—Improvement Study
- **Intransit Data Accuracy**

  LS200233900—Requirements Team Study

Lieutenant Colonel Gary M. Johnson

Innovation and Transformation

Logistics Readiness

The team of ten logistics readiness professionals completed significant logistics studies while participating in major wargaming efforts in 2003. Despite the challenges of reorganization and a major end-of-year relocation from Gunter Annex to Maxwell AFB, no less than 12 studies and 8 wargame actions were completed.

Transportation and Logistics Plans Divisions Form New Logistics Readiness Division

In 2003, AFLMA began a significant reduction process that promises to transform the Agency over the next few years. The Transportation and Logistics Plans Divisions became the Logistics Readiness Division, kicking off the process by reducing the overall number of Agency divisions by one. This reorganization better aligns the AFLMA structure with that of the logistics community as a whole, both in the field and at Headquarters Air Force. Eventually, all three logistics-related functions within the Agency (transportation, plans, and supply) will become part of the Logistics Readiness Division, mirroring logistics readiness squadron specialties at the wing level. For now, we are reaping the benefits of the plans and transportation specialists, working together and sharing expertise on projects that blur the traditional stovepipe specialty lines.

Logistics Readiness

As an added benefit, when young logistics officers complete their AFLMA tours, they will have a much wider perspective of their vastly expanded career field.

The team of ten logistics readiness professionals completed significant logistics studies while participating in major wargaming efforts in 2003. Despite the challenges of reorganization and a major end-of-year relocation from Gunter Annex to Maxwell AFB, no less than 12 studies and 8 wargame actions were completed. Notable improvement and consulting studies, as well as endless work on a vast array of wargames, kept everyone striving to finish important projects for wing, major command (MAJCOM), and Headquarters Air Force requests. Some of the significant achievements and current projects include:

Afloat Prepositioning of Nonmunitions War Reserve Materiel

In the afloat prepositioning study, we examined the impact to the Central Command's operations plan of placing a portion of Air Force nonmunitions war reserve materiel (WRM) on a prepositioning vessel. The results show that, even with no strategic warning, many of the combatant commander's requirements can be met with equipment prepositioned afloat, and with a 7-day warning, afloat prepositioning delivers 100 percent of the unit type codes by the required delivery date with selective augmentation from existing rail lines.

WRM Readiness Reporting

The WRM readiness reporting study was conducted at the request of Headquarters Pacific Air Forces (PACAF) to help it identify meaningful WRM metrics and then develop an algorithm to tie WRM metrics to operational impact and cost. AFLMA research indicated that the current PACAF readiness reporting method is as good as the Status of Resources and Training System, but it may not be quantitative enough to justify funding. For a long-term solution, we determined that a modified version of the Logistics Feasibility Analysis Capability could provide the best long-term solution, if funded, to eliminate usability issues.

Medical Logistics: Evaluation of the Recent Deployments of Expeditionary Medical Assets

In April, the Air Force Surgeon General requested that AFLMA study the

establishment of central WRM storage and deployment centers to address the transportation challenges created by lighter medical equipment packages. After examining time-phased force deployment data (TPFDD), contacting numerous functionals, and conducting several site visits, we concluded that these transportation challenges were experienced throughout the Air Force, and that while consolidation alone would facilitate improved deployment operations, it may not be the deployment cure-all the medical community anticipates.

Logistics Officer Handbook

With the transformation of the base-level logistics processes, transportation, supply, and logistics plans officers are now logistics readiness officers. This change necessitated an update to the *Logistics Officer Handbook*. We took on the challenge, and the updated book now provides officers with information on education, training, and career opportunities available throughout a career in logistics.

Analysis of TP1/999 Shipments in the AMC System

The goal of this study is to show how high-priority cargo moved before and during contingencies to get a true picture of the cargo movement system under heavy load. The Readiness Division is exploring how the use of Air Mobility Command's (AMC) Worldwide Express program might help the situation. Finally, we want to give decisionmakers the information to establish business rules to help move critical cargo faster.

Air Force Vehicle Requirements Determination

This year, we completed the Air Force vehicle requirements determination mentioned in the annual last year. The main objective of this study was to determine if problems exist in the vehicle requirements determination process. The study found the overall vehicle requirements process is straightforward and attempts to rightsize the number of vehicle authorizations required, but perception of vehicle shortages is clouded because requirements and assets on hand were not reported accurately in the *accountable* system. Using Air Force Equipment Management System reports, MAJCOM fleet managers could conduct annual accountability reviews to ensure base-level fleet managers are accurately reporting requirements.

Vehicle Maintenance Safety, A Guide for the Air Force Vehicle Maintainer

As a consulting partner, AFLMA assisted the Vehicle Team at the Headquarters Air Force Materiel Management

2003

and Policy Division in gathering data from vehicle maintenance subject-matter experts to develop a handbook for Air Force vehicle maintainers. The handbook serves as a quick reference, further developing, integrating, and sustaining operations risk management as a normal decisionmaking process for Air Force vehicle mechanics in day-to-day operations.

OLVIMS Product Selection

The Headquarters Air Force Materiel Management and Policy Division Vehicle Team requested that SMSgt Alan Lindsay, AFLMA Logistics Readiness Division, serve as a team member for the Online Vehicle Interactive Management System (OLVIMS) product selection. The ultimate goal of the Installations and Logistics Systems Program Office is to "Provide a logistics enterprise information system that supports the entire logistics chain by providing the right information, to the right people, at the right time at an affordable cost." The Air Force has made a commitment to follow industry trends and management practices. The Air Force will adapt its practices to fit within the capabilities of common industrial practices and the capabilities of the configured commercial off-the-shelf products. The new operational architecture, developed through a supply-chain operations model reference methodology, defines the business perspective of how the Air Force will conduct the business of vehicle fleet management in the future. The replacement system will be a Web-based system that tracks vehicle operations and maintenance; collects specific operations and maintenance data for base-level managers; and reports upward to the Air Staff, MAJCOMs, Congress, and other agencies. The system will make near real-time reporting a reality with total asset visibility to the users. Because the program will be Web-based, it will be accessible using standard browsers. It will give any .mil user system access from anywhere in the world when connected to the Internet. The exception will be with the stand-alone and deployable modules, which will have the same general or full capability of the Web-based system. The Web-based system will be readily available for stand-alone and deployable users once connectivity is established.

Improving Processing Shipments: Part 1—Inbound

The Readiness Division is working on a series of studies to improve intransit visibility. The first area analyzed was the processing of inbound shipments. This study took place during the reorganization of supply and traffic management offices under the new distribution flight. The study revealed duplication in physical handling and system processes. Recommendations were provided to reduce duplicative efforts and provide better intransit information in the current systems.

Ramstein Superhub

Headquarters United States Air Forces in Europe and the European Command (EUCOM) requested the Readiness Division look at areas to improve air and surface cargo operations at Ramstein AB, Germany. Under the EUCOM umbrella, all the Services play a role in sending and receiving cargo through the Ramstein community. The lead players are the Army's 37th Transportation Company and the Air Force's Air Mobility Command. Unfortunately, each service has its own transportation information system. This study will assist Ramstein AB with streamlining both its cargo-handling and systemic processes.

Space-Available Travel Capacity

We currently are conducting an analysis of the capacity of the Space-Available Travel System. The primary objectives of the study are to determine the number of seats available to the Space-A traveler and provide information to respond to requests to expand the program. Space-A travel is a very important quality-of-life issue and

often considered an entitlement instead of the privilege that it is. Capturing accurate data has been difficult because Space-A seats are essentially a byproduct of our airlift system; however, our analysts are creating a methodology to interpret the available data to give us insight into the questions that we are trying to answer.

Global Engagement VI

As in previous years, AFLMA was a key player in the Global Engagement VI (GE VI) wargame. There are four primary objectives of the GE series. First, these games should make a direct contribution to maintaining national security. Second, the wargames seek to portray accurately the capabilities that air and space power bring to the combatant commander's fight. Third, Global Engagement seeks to educate and inform current and future Air Force decisionmakers on maximizing the capabilities of air and space power, overcoming challenges to national security, and identifying problem areas for future research. Finally, these wargames should provide a valid input to the long-range planning process in the Air Force. This effort enables planners to meet future challenges.

GE VI is set in the 2015 timeframe, and the United States is faced with a near-peer, highly technically advanced foe. US assets have been reduced in the region, and we must bring a large force to bear quickly.

The highlighted focus areas included the Global Strike Task Force, Global Mobility Task Force, and Global Intelligence Surveillance and Reconnaissance Task Force. Our challenge has been to analyze the logistics support required to enable these forces. AFLMA provided support and analysis both before and during the game. Subject-matter experts analyzed the Agile Combat Support capabilities necessary to meet operational requirements. The results of this analysis will help shape the size and nature of tomorrow's Air Force.

Global Mobility Wargame 2003

The Global Mobility (GLOMO) Wargame 2003 is the second of an annual series designed to integrate logistics and mobility more fully with operational planning. The AFLMA Logistics Readiness Division was actively involved in this year's effort that focused on postgame analysis of the GE VI scenario. The objectives of the GLOMO wargame series include exploring areas not typically analyzed with any level or fidelity at Title X wargames and examining future mobility concepts and shortfalls. Additionally, it seeks to provide realistic mobility assumptions and feedback for the GE wargames and assess validity and relevance of mobility game products. Specific objectives addressed include applying global mobility concept-of-operations (CONOPS) base-opening capabilities in anti-access and permissive environments, exploring an alternative for conducting operations under various Civil Reserve Air Fleet (CRAF) operating assumptions in an anti-access and permissive environment, and examining the feasibility of tanker employment in the GE VI scenario. GLOMO 2003 also explored the force module package concept currently under development by the Headquarters Air Force Special Assistant for Air and Space Expeditionary Forces.

GLOMO 2003 provided many insights and recommendations. Three are especially noteworthy. First, the force modules should be flexible and modeled for each location, mission, customer, threat, and duration by a joint airfield coordination board. Second, CRAF has the ability to move passengers and cargo at a rate that exceeds the requirements in this scenario; however; CRAF will not fly into high-threat areas. This results in a requirement for a transload location to deploy into the threat ring. There are several measures that can reduce the time and material cost of transloads. Third, lack of fidelity with regard to combat air forces limits tanker planning.

Air Force Research Lab Study

As the Air Force set out to define and develop the Global Strike CONOPS, a number of issues needed to be addressed by the warfighter and analytical community. One of these issues dealt with mobility support. The Aeronautical Systems Center (ASC) Aeronautical Enterprise Program Office was directed in 2002 to conduct a task force capability study. The focus of this study was analyzing warfighting effects and capabilities needed to achieve them as the major factor of system acquisition and technology investment. A subset of this effort was a mobility assessment study. Its objective was to assess the airlift and aerial refueling capabilities required to support the Global Strike CONOPS. As part of the larger mobility assessment study, AFLMA assisted planners from the Air Force Studies and Analysis Agency, Air Force Research Laboratory, and ASC by developing a transportation feasible TPFDD. This TPFDD was used to determine the feasibility and sustainability of current planning efforts focused on the Global Strike CONOPS. This TPFDD served as the key analytical underpinning to support the mobility assessment performed by AMC. A secondary benefit of the TPFDD development was the insight provided by AFLMA on proposed beddown locations and staging base laydowns for the RT-2 scenario. The lessons learned and analytical results were significantly more credible because of the use of a complete TPFDD. Finally, the study showed the impact of mobility capabilities and limitations on the force flow in subsequent operations.

Logistics planning—the wisdom to realize when your working on plan A, you're run into conflicts in executing plan B and being properly prepared, and successfully executing plan E.

—Captain John P. Laverdure, USAF

Completed 2003 Projects

- *Operation Noble Eagle and Enduring Freedom Installations and Logistics Legacy* Book
  LT200209200—Consulting Study
- Air Force Combat Readiness CD-ROM
  LT199914700—Improvement Study
- *Vehicle Maintenance Operational Risk Management Handbook*
  LT200212000—Consulting Study
- Air Force Vehicle Requirements Determination
  LT200213400—Improvement Study
- Improving Processing Shipments: Part I—Inbound
  LT200216102—Improvement Study
- Review of Air Force Instruction on Intransit Visibility
  LT200305004—Consulting Study
- Global Command and Control System/Deliberate and Crisis Action Planning and Execution System Support for Combat Support Center—Pentagon
  LX200312500—Consulting Study
- Global Strike Task Force Mobility Assessment, Part I
  LX200232900—Consulting Study
- Reconstitution Planning: An Analysis of Policies, Procedures, and Lessons Learned
  LX200301604—Consulting Study
- 42d Air Base Wing Operational Readiness Inspection Assistance
  LX200312501—Consulting Study
- Schriever II Wargame
  LX200304400—Consulting Study
- Global Strike Task Force Mobility Study, Part II
  LX200302900—Consulting Study
- Afloat Propositioning of Nonmunitions War Reserve Materiel, Phase II
  LX200125700—Improvement Study
- *Logistics Officer Handbook 2003* Update
  LX200202201—Improvement Study
- Global Engagement VI
  LX200109200—Consulting Study
- War Reserve Materiel Readiness Reporting
  LX200211400—Improvement Study
- Air Expeditionary Wing Analysis System
  LX200205200—Consulting Study
- Homeland Security Wargame
  LX200305005—Consulting Study
- Evaluation of Recent Deployments of Expeditionary Medical Assets
  LX200310702—Improvement Study

Logistics Readiness Divsion

- Analysis of TP1/999 Shipments in the Air Mobility Command System

  LT200301300—Improvement Study
- Ramstein Superhub

  LT200311800—Improvement Study
- Space-Available Travel System Potential Capacity Analysis

  LT200316702—Improvement Study
- Global Logistics and Mobility Game 2003

  LX200305006—Consulting Study
- Homeland Security/Homeland Defense Game

  LX200305005—Consulting Study
- Enduring Look

  LX200128500—Consulting Study
- Focused Logistics Wargame 03

  LX200212901—Consulting Study
- Global Engagement VII

  LX200327602—Consulting Study

Content of the handbook was developed by 2T3XX vehicle maintenance subject-matter experts, while AFLMA assisted in capturing information from subject-matter experts, designed and published the handbook, and conducted initial distribution.

Vehicle Maintenance Safety

Senior Master Sergeant Alan L. Lindsay

Why a safety handbook for the vehicle maintainer? Mishaps in 2002 indicated a need to emphasize safety within Air Force Vehicle Maintenance shops through another media to help enhance operational risk management (ORM). The Air Force ORM program is outlined in Air Force Policy Directive 90-9; its basic principles are (1) accept no unnecessary risk, (2) make risk decisions at the appropriate level, (3) accept risk when benefits outweigh the costs, and (4) integrate ORM into operations and planning at all levels. To support these principles, the Air Force applies ORM during all aspects of preparation (planning, organizing, training, equipping, and sustaining) and employment of aerospace forces.

Within vehicle maintenance, there are several references and offices addressing safety issues for personnel, such as technical orders, Air Force Occupational Safety and Health, National Institute for Occupational Safety and Health, Air Force manuals, and industry. Because of the vast number of references, it is hard for personnel to know every source and where to reference them. Additional self-inspection checklists do an adequate job of identifying some of the important issues but in no way even scratch the surface of all issues, concerns, and requirements one must follow. The objective was to develop a handy pocket-sized safety guide, emphasizing ORM, to be tailored to hazards that exist in vehicle maintenance operations and, for the hazards identified, to provide safety tips, cautions, warnings, and references to applicable policies. The expected impact of the handbook is to increase both the organization's and individual's ability to manage risks, thus maximizing mission effectiveness and sustainment of readiness.

AFLMA acted as a representative to facilitate the Vehicle Team at Headquarters Air Force Installations and Logistics, Materiel Management and Policy Division at their sponsored safety workshop in May 2002 that determined the actual content and layout for the handbook. Content of the handbook was developed by 2T3XX vehicle maintenance subject-matter experts, while AFLMA assisted in capturing information from subject-matter experts, designed and published the handbook, and conducted initial distribution.

The *Vehicle Maintenance Safety, A Guide for the Air Force Vehicle Maintainer* chapters are as follows:

Chapter 1. Operational Risk Management (ORM)

Chapter 2. Individual Responsibility

Chapter 3. Work Center Hazards

Chapter 4. Shop Awareness

Chapter 5. Vehicle Systems

Chapter 6. Tools and Equipment

Chapter 7. Hazardous Material and Hazardous Waste

Chapter 8. Mishap Reporting Procedures

Appendix 1. Glossary

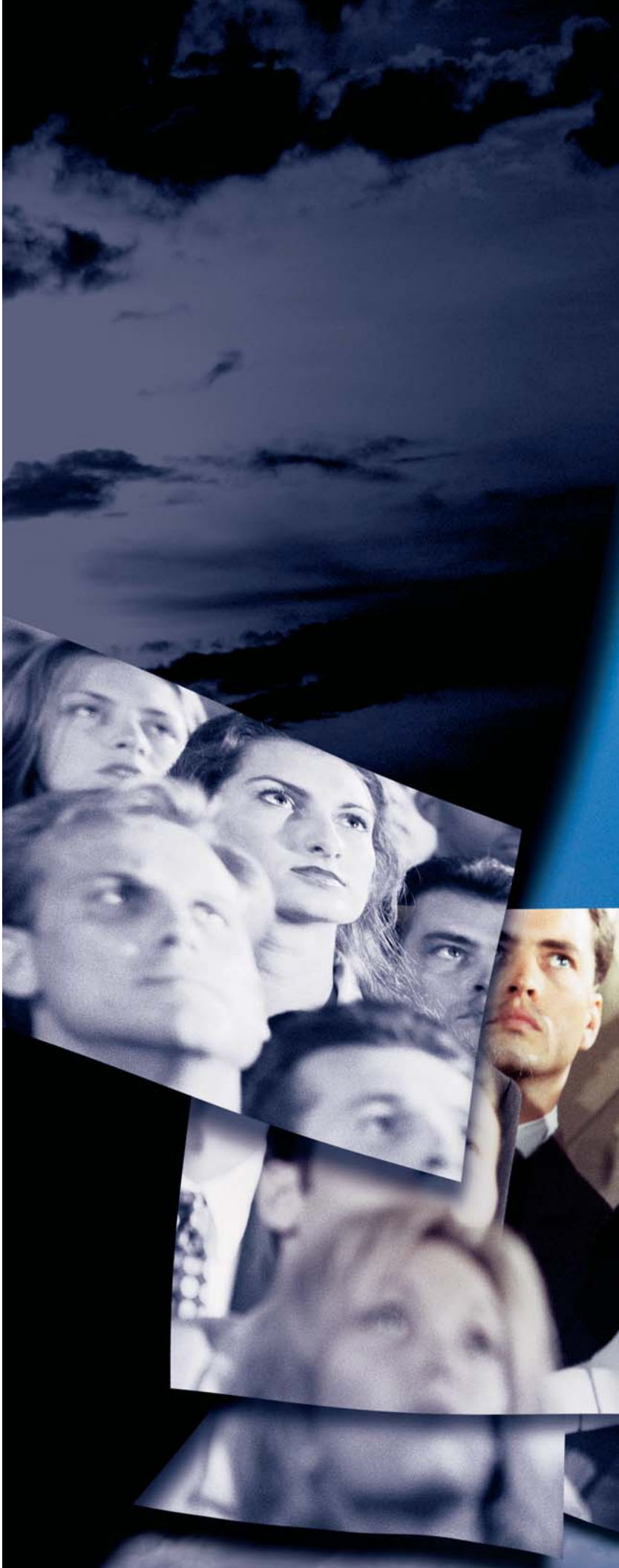
Appendix 2. Quick Reference List of Publications

Appendix 3. Quick Reference List of Emergency Phone Numbers

The handbook design and layout were completed and sent to the printers in February 2003, and in May 2003, approximately 7,500 copies were mailed out to each 2T3XX vehicle maintainer in the Air Force. A PDF version of the *Vehicle Maintenance Safety Handbook* can be obtained on the Journal of Logistics Web page at http://www.aflma.hq.af.mil/lgj/Vehicle_maint_safety_security_15may2003.pdf. For sustainability of the handbook, the Air Staff has indicated they will make this an Air Force pamphlet that will allow for periodic updates and changes and for distribution to each new 2T3 vehicle maintainer.

Planning is everything—plans are nothing.

—Field Marshal Helmuth von Moltke



Meeting Your Needs

Meeting your needs. That means two things: first, understanding what the problem really is and, second, giving our customers a great, workable solution. That is sometimes tough. We take on the tough questions, issues, and problems; and we deliver robust, tailored answers and solutions. Our track record makes us the logistics studies and analysis agency of choice across the Air Force.

AFLMA not only delivers what the customer needs—at no cost to the customer—but also does it quickly. The average time for most of our studies is 6-9 months or less, but if needed, we can *turn around* a study much more quickly. These are two of the things that separate us from our competitors in private industry. Conservatively, what our annual $700K operating budget supports would cost in the $5M range if it were done in the private sector, and most studies would take a year or longer to complete, not 6-9 months.

AFLMA

Generating Solutions Today,
Shaping Tomorrow's Logistics

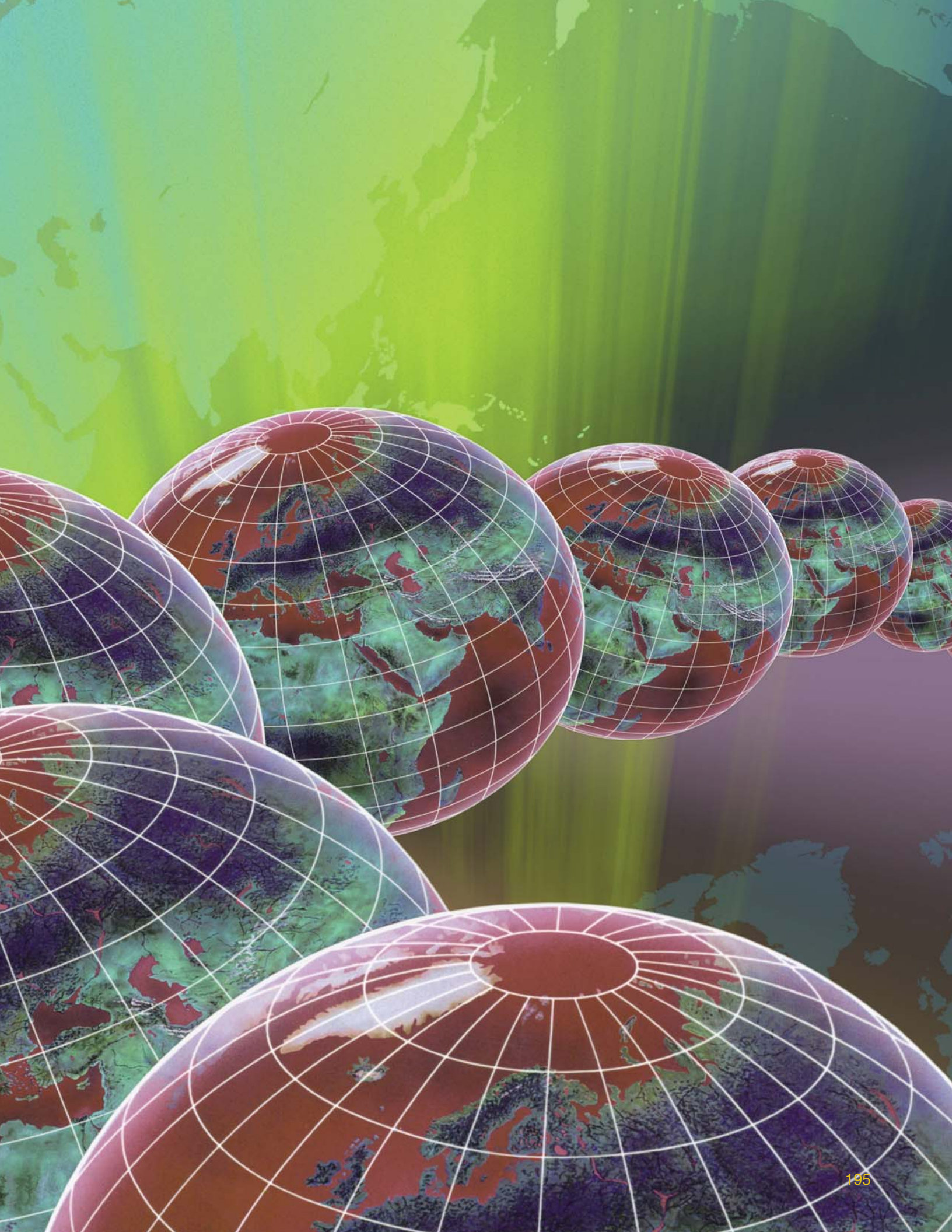
Captain Joseph B. Skipper
Ms Sandi Nagy Sinclair, AF/XOXS (SAIC)

Global Mobility Game 03

Introduction and Background

The Global Mobility Wargame (GLOMO) 2003 is the second of an annual series designed to integrate logistics and mobility more fully with operational planning. Last year's game, GLOMO I, was a precursor to Global Engagement VI (GE VI) and allowed for the development of the first transportationally feasible time-phased force deployment listing for a Title X wargame. This year's effort focused on postgame analysis of the GE VI scenario. By using existing data from GLOMO 2003 as a constant, AFLMA will continue to examine specific areas within the logistics arena.

In August 2002, the Air Mobility Battlelab, in conjunction with the Air Mobility Warfare Center (AMWC); AFLMA; Air Mobility Command (AMC) Plans and Programs; and Headquarters Air Force Strategy, Concepts, and Doctrine Division conducted the first-ever Global Mobility Wargame (GLOMO 2002). GLOMO 2002 was tied closely to the pregame analysis period for GE VI, the Chief of Staff of the Air Force (CSAF) Title X wargame. Key objectives for GLOMO 2002 included refining the GE VI wargame products and providing players the opportunity to investigate logistics and mobility enablers required to support future warfighting concepts. GLOMO 2002 tasked players to assess feasibility and provide courses of action, thereby increasing the level of fidelity of logistics and mobility play in wargames.



The GLOMO wargame series seeks to meet the following objectives:

- Explore areas not typically analyzed with any level of fidelity at Title X wargames.
- Examine future mobility concepts and shortfalls.
- Provide realistic mobility assumptions and feedback for the GE wargames.
- Assess validity and relevance of mobility game products.

Results of GLOMO 2002 fed directly into the GE VI planning process. Throughout the pregame workup for GE, planners from the AMWC; Air Force Strategy, Concepts, and Doctrine Division; United States Transportation Command (USTRANSCOM) J3/J5; AMC; Headquarters Air Force Planning, Doctrine, and Wargames Division; and AFLMA met on a monthly basis to develop and refine a joint mobility concept that supported the GE VI campaign plan. Following the GLOMO 2002 wargame, the team provided feedback to the GE VI joint task force commanders (CJTF) that allowed them to refine their campaign plans accordingly prior to the GE VI wargame.

GE VI was executed 3-9 November 2002. GE VI featured a realistic Annex-D, a Level 4 time-phased force deployment document, two directors of mobility forces (DIRMOBFOR) who had participated in the campaign planning in GLOMO 2002, and a well-developed tanker allocation plan.

Following the game, the planning staff and game players met on several occasions to identify key issues and insights to submit to the CSAF for postgame analysis. The issues identified in these venues provided the underlying foundation for the GLOMO 2003 objectives.

In December 2002, the AMC Vice Commander ordered that GLOMO become a recurrent event with the AMWC as the lead agent for the GLOMO series. As such, AMWC served as the planning and execution agency for GLOMO 2003. AMC Plans and Programs was tasked with providing policy guidance. Other partners integral to the game design and preparation include the AMC Director of Operations; Air Force Strategy, Concepts, and Doctrine Division; AFLMA; and USTRANSCOM/J5.

AMWC hosted GLOMO 2003 from 23 to 27 June at its facility in Ft Dix, New Jersey. This wargame was used as a venue to perform postgame analysis on GE VI. The background and data supporting GLOMO 2003 were built on the foundation of the GE VI wargame, and the objectives were derived from GE VI insights. Results from GLOMO were briefed to the CSAF in September 2003.

GLOMO Objectives

Within the context of the Global Mobility Wargame Series overarching goals, GLOMO 2003 addressed the following specific objectives:

- Apply global mobility (GM) concept of operations (CONOPS) base-opening capabilities in anti-access and permissive environments (GE VI tasker).
- Explore alternatives for conducting operations under various civil reserve air fleet (CRAF) operating assumptions in an anti-access and permissive environment.
- Examine the feasibility of tanker employment in the GE VI Scenario.

GLOMO 2003 explored the force module package concept currently under development by the Headquarters Air Force Special Assistant for Air and Space Expeditionary Forces (AEF Center). By using the GE VI game play as the scenario, planners examined the future Air Force and joint requirements necessary to open and operate from a variety of base capabilities under a variety of threat situations, ranging from anti-access air threats to forced entry operations. GLOMO 2003 used two *moves* from GE VI, each presenting a diverse capability and threat situation in which planners applied the GM CONOPS base-opening concept.

In light of the robust threat capability of the adversary (Red), the GE VI scenario demonstrated a need for the Transportation Command to work within the ballistic missile threat ring. This required an ad hoc transload point to protect the CRAF and prevent it from operating inside the threat ring. Subsequently, the new transload point increased the organic lift requirement within the theater and further underscored the flexibility and value of the C-17s as a multiple role aircraft.

Finally, Red's dispersal and concealment tactics of its surface-to-air and cruise missiles resulted in the combined force air component commander's establishing 24/7 time-critical target combat air patrols over Red. GLOMO players examined this increased tanker demand to determine the feasibility of the high ops tempo.

In conjunction with GLOMO's overall objectives, AFLMA established objectives to support analysis and improve the overall outcome of the game. These objectives were selected carefully to ensure they were not counterproductive to the overall event. These objectives include:

- Provide subject-matter experts to the event as planners, players, and assessors.
- Examine specific operational requirements and compare them to logistics capabilities.
- Compare the capabilities determined as necessary to support operational requirements with current force module planning efforts.
- Support the objectives of AMC; AMWC; and Air Force Strategy, Concepts, and Doctrine Division.
- Continue to improve the Agile Combat Support (ACS) wargame support process.

Scope

The scope of the GLOMO wargame series is selectively narrow. The purpose, as stated above, is to analyze specific issues within the logistics and mobility arenas. AFLMA's

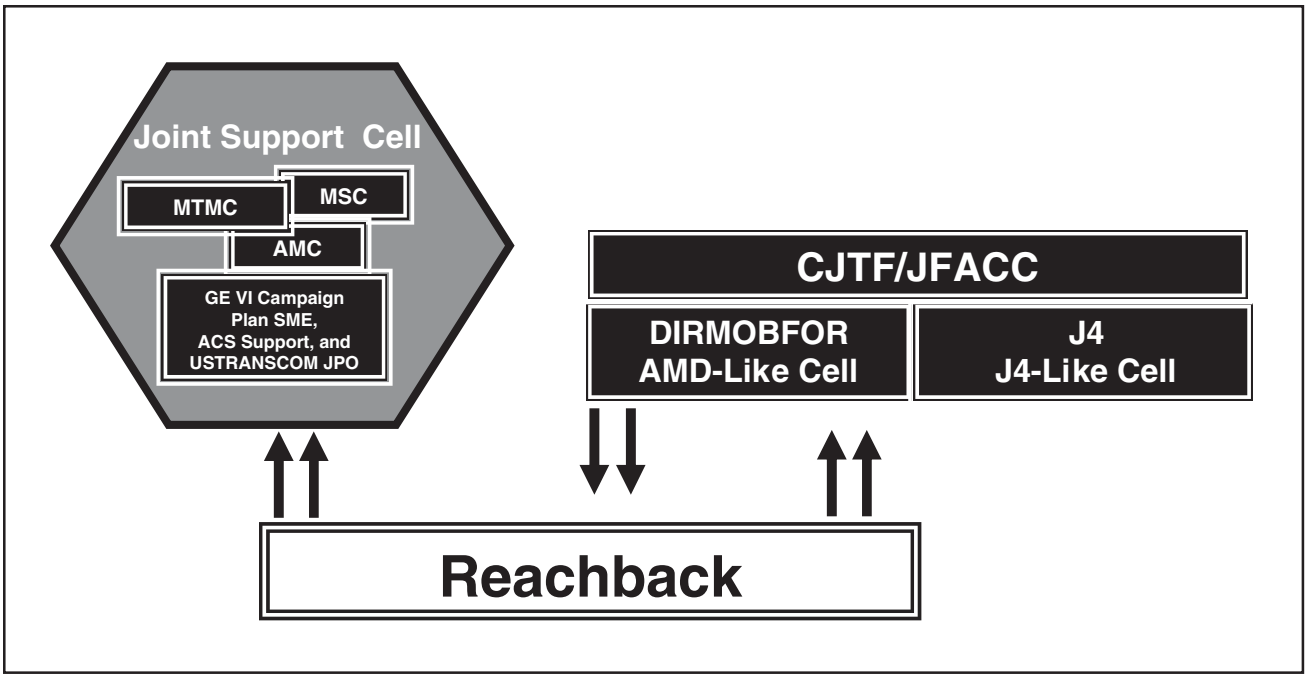


Figure 1. GLOMO Team Construct

objectives include analysis of operational requirements and logistics and ACS capabilities. A comparison will be made to determine if the right capabilities are planned for at the right times and in the right places. The current force modules being built by the AEF Center also will be used to determine if gaps in capabilities exist. By narrowing the focus of this study to the specific areas of munitions, fuels, and transportation throughput, it is hoped that problem areas, if found, can be resolved.

The impacts of this analysis potentially affect all forces associated with current force module planning. The units are spread across the entire spectrum of Air Force capabilities.

Game and Team Construct

GLOMO 2003 is a result of more than 6 months of effort. The design and development phase of the game consisted of planning meetings where game design decisions were made and objectives were reviewed and selected. The results of this planning effort are described below.

The GLOMO 2003 game construct is similar to the current logistics and mobility command structure but does not mirror it exactly. The differences evolved in an attempt to emphasize specific functional areas, thereby adding to the analysis performed during the game and enhancing the overall game objectives. Figure 1 illustrates the basic team construct for GLOMO 2003.

The Combined Joint Task Force and Joint Forces Air Component Commander (CJTF/JFACC) team focused within the theater and included an air mobility division-like cell, led by a DIRMOBFOR. This cell contained airlift, aerial refueling, and air mobility control teams with players representing Twenty-First Air Force; AMWC; Aerospace Command and Control and Intelligence, Surveillance, Reconnaissance Center; Tanker Airlift Control Center; AMC; 620/621 Air Mobility Operations Group Security Forces Division; and the US Army Training and Doctrine Command (TRADOC). The second cell in the CJTF/JFACC team was a J-4-like cell with a J-4 lead and contained a sustainability and plans division, engineering division, and mobility division. Headquarters Air Force Combat Support Center and Readiness Assessment Division, AFLMA, AMC Director of Logistics, and the TRADOC Deployment Process Modernization Office (DPMO) populated this cell. The Joint Support Cell served a USTRANSCOM-like role and focused on capabilities outside the theater. This team contained planners from the Air Force Planning, Doctrine, and Wargames Division; USTRANSCOM/J5; AMC; AMWC; TACC; MSC; and Headquarters Air Force Directorate of Operational Capability Requirements. The Joint Support Cell also contained a team of key GE VI campaign planners from Air Force Strategy, Concepts, and Doctrine Division and TRADOC. A group of modelers floated between the teams to collect data and model potential outcomes for the players.

Because of the analytic nature of the game, some GE VI campaign planners were embedded in the teams as part of game control to keep the game running smoothly. These campaign planners were familiar with game documents and background material and had participated in GE VI and provided the planning foundation for GLOMO 2003.

GLOMO 2003 took a unique approach to wargaming, providing the teams an increased opportunity to conduct analysis. Rather than identifying a starting point and asking players to plan, GLOMO 2003 presented teams with past actions (events or moves that took place in GE VI) and asked them to evaluate actions from GE, analyze deficiencies, and recommend alternative courses of action.

Monday	Tuesday	Wednesday	Thursday	Friday
0730-0900 Check in and Register **0900-1700** • Overview • GE VI Briefs • Model Brief • CRAF Brief • FM Brief • GM CONOPS • MMP Brief • PADS/Pegasys Brief **1830** GLOMO Reception at McGuire Club	**0800-0900** Vignette One Briefs **0900-1600** Teams Work Through Vignette One **1600-1700** Teams Provide Status Reports	**0800-1100** Teams Work Through Vignette One/Complete Briefs **1200-1300** GLOMO Spotlight General Fogleman **1300-1400** Vignette Two Briefs **1400-1700** Teams Work Through Vignette Two	**0800-1300** Teams Work Through Vignette Two **1300-1400** Teams Provide Status Reports **1400-1600** Teams Work Through Vignette Two/Complete Briefs **1600-1700** GLOMO Spotlight General Kelly	**0800-0900** Insight Session **0900-1200** Hotwash • Teams Brief Vignette One • Teams Brief Vignette Two

Figure 2. Battle Rhythm

GE VI featured two free-play games, with two blue teams and two red teams. Each blue team (led by a CJTF) developed its own campaign plan. These campaign plans were the basis for the two GLOMO vignettes (described in detail below). Vignette One presented permissive basing in a robust anti-access threat environment, while Vignette Two presented a more permissive environment but very austere (Red) bases.

GLOMO 2003 kicked off on Monday, 23 June 2003, with a day of briefings to bring the players up to speed on GLOMO background, GE VI, Air Force and Joint CONOPS, and logistics and mobility concept developments that would aid the teams in addressing their tasks. Tuesday morning, the teams received inbriefs on Vignette One and began work to address the tasks. Each team leader provided a status update at the close of business to ensure the teams were on similar tracks with their research.

Vignette Two began on Wednesday afternoon and followed a similar battle rhythm. The teams developed briefings for each vignette, shared information, and compiled their research into objective-based briefings for a Friday hotwash. Figure 2 represents the game battle rhythm for the week.

Vignette Overview

Vignette One

Time Line: C+6 (D+1) through C+18 (D+13)

Objectives. In an anti-access threat environment and permissive basing environment, (1) apply GM CONOPS base-opening capabilities, (2) explore alternatives for conducting operations under various CRAF operating assumptions, and (3) examine the feasibility of tanker employment.

Overview. Vignette One examines Campaign Plan A, wherein the Blue Forces, responding to Red's trigger, initiate D-day at C+5. There were limited assets in theater, and follow-on forces deployed into the theater in the face of a robust Red anti-access threat. The plan further described an *over the horizon* air, space, and missile attack exploiting Blue's own asymmetric advantages in stealth, precision, and standoff munitions against key Red anti-access targets (weapons of mass destruction, integrated air defense systems, theater ballistic missiles, and antiship cruise missiles) with a gradual augmentation of persistent air forces (coalition and nonstealth forces) into theater. The initial strike and follow-on operations shaped the battlefield to allow ground operations.

Vignette Two

Time Line: C+19 (D-day) through C+35 (D+16)

Objective. Within a permissive threat environment, but nonpermissive basing environment, (1) apply GM CONOPS base-opening capabilities, (2) explore alternatives for conducting operations under various CRAF operating assumptions, and (3) examine the feasibility of tanker employment.

Overview. Vignette Two reviewed Campaign Plan B. Blue B's campaign plan was radically different from Game A. Blue B used a longer deployment time line (C+0-C+20) to build up a small but highly mobile joint force in the theater, as well as implement a large deception plan from the north. When the execute order was given at C+20, Blue launched a direct invasion into Red from the south. In a coordinated assault, Blue forces simultaneously captured

two shallow water ports using Marine elements and seized a strategic airport with the Army's objective forces. By seizing the airfield, Blue was able to establish a second front from which it could advance through Red. Blue's invasion of southern Red completely overwhelmed Red forces. Red leadership could no longer take significant actions to reposition forces to the Southern Area Command, and Red forces were unable to move freely within their country without incurring serious losses from Blue joint fire. Blue forces then made their push into Red's interior.

Tools and Programs

Prior to the game, in order to accomplish AFLMA specific objectives, subject-matter experts from several functional areas were asked to find and research potential programs or simulations that could be used to estimate the logistics capabilities required to meet operational requirements. Logistics plans; munitions; petroleum, oils, and lubricants; and transportation representatives found tools, including a capabilities-based logistics planner, fuels mobility support equipment calculator, an aerial port of debarkation (APOD), and the Munitions Agile Combat Support Model.

These tools were used to accomplish specific objectives proposed by AFLMA. The objectives were crafted as an adjunct to the three overall objectives of GLOMO 2003 described earlier. These AFLMA subobjectives supported the overall GLOMO objective of applying GM CONOPS base-opening capabilities in both anti-access and permissive environments.

Insights and Recommendations

The insights and recommendations were collected during and after GLOMO 2003 and represent the inputs from each of the three teams. A sample of the insights from the game are provided here as an example. While these are not all inclusive, they do represent the type of results wargames can provide. Insights from this particular event may, or may not, be applicable in all situations. The insights are separated according to the objective addressed.

Base-Opening Insights

Insight. The force modules should be flexible and modeled for each location, mission, customer, threat, and duration by a joint airfield coordination board. This entity would:

- Define the shape of the package,
- Determine the capabilities required to meet the mission, and
- Source the capabilities.

Insight. Force protection packages require joint coordination and are dependent on:

- The threat environment (air and ground) and
- Host-nation capabilities to alleviate the requirement for extensive force protection packages.

Recommendation. Wargames must continue to examine the cost and requirements for missile defense assets, as coalition and commanders alike continuously demand them. Air Force Deputy Chief of Staff for Air and Space Operations, Headquarters Air Force Installations and Logistics and the TRADOC Deployment Process Modernization Office continue close coordination to ensure proper play in the Title X wargames.

Insight. Additional capability requirements were identified for the force modules.

- Weapons safety capability should be added early in the force modules. Planning for storage requirements and transportation flow of explosives must be early in any contingency because of the space requirements and extreme hazards associated with explosives.
- May need more K-loaders to establish the base FM, particularly when using larger bases with a maximum on ground of more than two aircraft.

CRAF Insights

Insight. CRAF has the ability to move passengers and cargo at a rate that exceeds the requirements in this scenario; however, CRAF will not fly into high-threat areas. This results in a requirement for a transload location to deploy into the threat ring. There are several measures that can reduce the time and material cost of such transloads.

Recommendation. Explore measures to induce CRAF to fly into theater aerial ports of debarkation, including:

- Monetary incentives to industry;
- Risk-reduction incentives such as training, CW protection, or defensive systems;
- Limitation on ground time; and
- Early warning C2 ability for CRAF aircrew.

Recommendation. Explore alternatives to CRAF, including:

- Organic passenger aircraft in the Air Force inventory and
- Multimodal capabilities such as intratheater high-speed vessels

Insight. The transload issue is often less attributed to CRAF policy and more an issue of infrastructure and equipment.

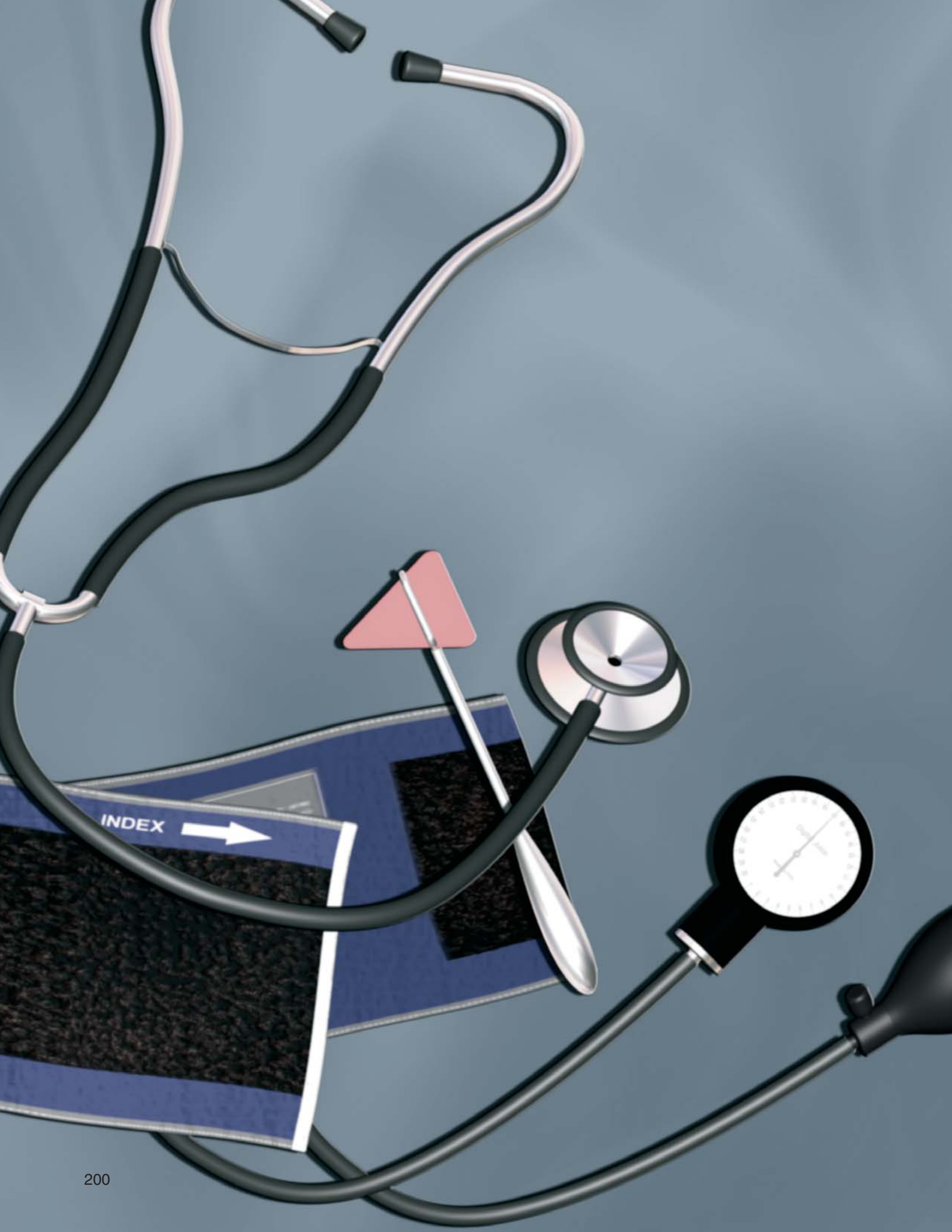
Tanker Insights

Insight. Lack of fidelity with regard to CRAF requirements limits tanker-planning capability.

Insight. Forward operation of tanker assets in an anti-access environment with a near-peer opponent requires defensive systems and real-time threat information in the cockpit.

Conclusion

GLOMO 2003 was considered by planners and participants to be a great success. Plans are already in progress to make GLOMO 04 even better. If you would like to learn more about GLOMO or other Title X wargames, please contact AFLMA via our Web site, https://www.aflma.hq.af.mil/lgr/lgrindex.html, or call DSN 596-3535.


INDEX

Evaluating Recent Deployments

Expeditionary Medical Assets

EMEDS and aeromedical evacuation can be consolidated to better facilitate deployment operations; Air Force Manpower Standard 5530, *Medical Logistics,* should be revised; the effects of consolidation would have a minimal impact on the current training methodology; and readiness reporting should be assigned to the organization with the physical custody of the materiel.

Captain Robert E. Overstreet

While the AFLMA mission is to enhance logistics efficiency and effectiveness, we have, to date, focused primarily on the line side of logistics. A refreshing change came in early April 2003, when the Air Force Surgeon General requested that AFLMA study the establishment of central war reserve materiel (WRM) storage and deployment centers. He stated that the lighter equipment packages that make up the expeditionary medical support (EMEDS) and aeromedical evacuation (AE) systems have created transportation challenges.[1]

The EMEDS system was built in 1999 to replace the large air-transportable hospital. This new system is a lightweight, rapidly deployable, modular medical capability that is flexible enough to respond to any scenario.[2] It follows a building-block approach to attain medical capability in theater. Much of the initial EMEDS capability is composed of care providers with backpacks, the Prevention and Aerospace Medicine Team, Mobile Field Surgical Team, and the Expeditionary Critical Care Team. The ten-man small, portable expeditionary aeromedical rapid response (SPEARR) capability is completed by the addition of the SPEARR trailer, which contains one tent with equipment and supplies. The EMEDS basic brings with it 15 more persons, two shelters, supplies, and equipment. EMEDS +10 contains 31 persons, three more shelters, and ten inpatient beds. EMEDS +25 contains 30 persons, three more shelters, and 15 inpatient beds. The EMEDS capability can continue to expand with additional ten-bed packages or specialty sets.

The EMEDS system unit type codes (UTC) are stored at and deployed from many different medical treatment facilities, both in the continental United States (CONUS) and overseas. Because of the large number of origins and different aerial ports of embarkation (APOE), the time phasing of the EMEDS and AE UTCs during Operation Enduring Freedom and Operation Iraqi Freedom was problematic.

The objectives of this study were to quantify the problems experienced in the deployment of EMEDS and AE UTCs, identify the root causes of those problems, evaluate possible solutions, and provide a recommended solution to the Air Force Surgeon General's Office.

We assumed that only the UTCs identified were candidates for consolidation, and we only were concerned with CONUS-based UTCs. This study made no attempt to validate or invalidate the EMEDS or AE concepts.

Limited time and conceptual complexity were significant constraints for this study. AFLMA was asked to provide initial recommendations within 4 months of the meeting with the Air Force Medical Logistics Office (AFMLO). The complexity of the EMEDS and AE consolidation issue easily could have justified multiple studies.

AFMLO scoped the project to an evaluation of 31 UTCs that deployed from the CONUS and identified two consolidation options. The first option was establishment of a central hub located at KellyUSA, and the second option was the establishment of a dual hub, with one located on the east coast and the other on the west coast. They also provided copies of the time-phased force deployment data (TPFDD) for Enduring Freedom and Iraqi Freedom.

Because of deleted requirements in the TPFDD and new required delivery dates established when a UTC missed a key transportation date, we determined that an evaluation of the transportation data received from Air Mobility Command would not provide reliable information.

Interviews with functional representatives from civil engineering, communications, and security forces suggested that they experienced similar transportation problems. We identified the root causes of these problems as constrained airlift, intransit visibility issues, and a high number of deployment points of contact. Of these, only the number of points of contact can be addressed directly by the medical community.

Possible solutions include keeping these UTCs at their current locations and increasing deployment training, creating consolidation plans that can be accomplished just prior to deployment, or physically consolidating the UTCs. Because the first two solutions do not limit the number of deployment points of contact, this study evaluates different consolidation options based on benefits, costs, mission impact, and risks.

Consolidation has many intrinsic benefits. It reduces the number of deployment points of contact, generates economies of scale and scope, creates greater deferred procurement opportunities, improves quality control, and aggregates UTCs, which is critical when operating with limited aircraft availability.[3]

We calculated the one-time cost to transport the UTCs, warehouse rental costs, contractor salary differential, and military construction costs. After much discussion about training, we found that the current training methodology can support the increase in the number of people who need training at one of the three training facilities.

The following are two mission impacts of consolidation: EMEDS and AE capability would be built, stored, maintained, reported, sourced, and deployed from one or just a few locations; and the fewer locations would ship that capability through fewer APOEs.

Consolidation creates large concentrations of CONUS EMEDS and AE UTCs that could represent a significant loss of medical capability if made unavailable (for example, natural disaster, fire, or terrorist attack). However, two full EMEDS +25 sets are stored separately to support homeland defense, and a large portion of the EMEDS capability is prepositioned overseas. There is a risk that consolidation alone will not provide the expected benefits if it becomes necessary to deploy small chunks of capability over an extended period. Deploying medical capability piecemeal potentially could necessitate the use of a large number of APOEs.

This study concludes that EMEDS and aeromedical evacuation can be consolidated to better facilitate deployment operations; Air Force Manpower Standard 5530, *Medical Logistics,* should be revised; the effects of consolidation would have a minimal impact on the current training methodology; and readiness reporting should be assigned to the organization with the physical custody of the materiel.

This study recommends that the Air Force Medical Service consolidate EMEDS and AE UTCs at KellyUSA, the Air Force Medical Service should request that Air Force Manpower Standard 5530 be recomputed for the management of medical WRM, and the Air Force Medical Service should task AFMLO to report readiness on EMEDS UTCs located at AFMLO/FOW.

Consolidating all 31 EMEDS and AE UTCs at a single site increases the possibility of getting dedicated airlift, which helps ensure that the medical capability is attained at the right place, at the right time. Even after deducting the cost of the warehouse, using the capacity that is already available at Kelly saves the AFMS $298K annually. While there may still be multiple APOEs, especially with smaller deployments, having one unit and one origin for all these UTCs makes the process of sourcing and tasking more straightforward. Another benefit is that reducing the number of points of contact enhances intransit visibility.

Consolidation of both EMEDS and AE increases quality control of the UTCs by having a small cadre of people whose primary job is to manage these UTCs on a day-to-day basis. Each option may lend itself to other savings such as deferred procurement of shelf-life items. The focused efforts of a small number of persons managing the buildup, storage, maintenance, readiness reporting, and deployment of this medical capability will lead to economies of scale and scope savings.

Ultimately, the question is whether this will solve the deployment problems experienced during Enduring Freedom and Iraqi Freedom. While consolidation goes a long way to improve the management, sourcing, and intransit visibility of AE and EMEDS UTCs, it is not a deployment panacea. The Air Force still faces an airlift shortfall and, ultimately, the prioritization of cargo and the availability of airlift drive cargo movement.

Notes

1. Lt Gen George Peach Taylor, Air Force Surgeon General, memorandum to Lt Gen Michael E. Zettler, Deputy Chief of Staff for Installations and Logistics, subject: Request for AFLMA Study of the Establishment of Central WRM Storage and Deployment Centers for Medical Assemblages, 4 Apr 03.
2. *Ibid.*
3. Chairman of the Joint Chiefs of Staff Manual 3122.02B, *Joint Operation Planning and Execution System (JOPES),* Vol III, 25 May 01, H-A-9.

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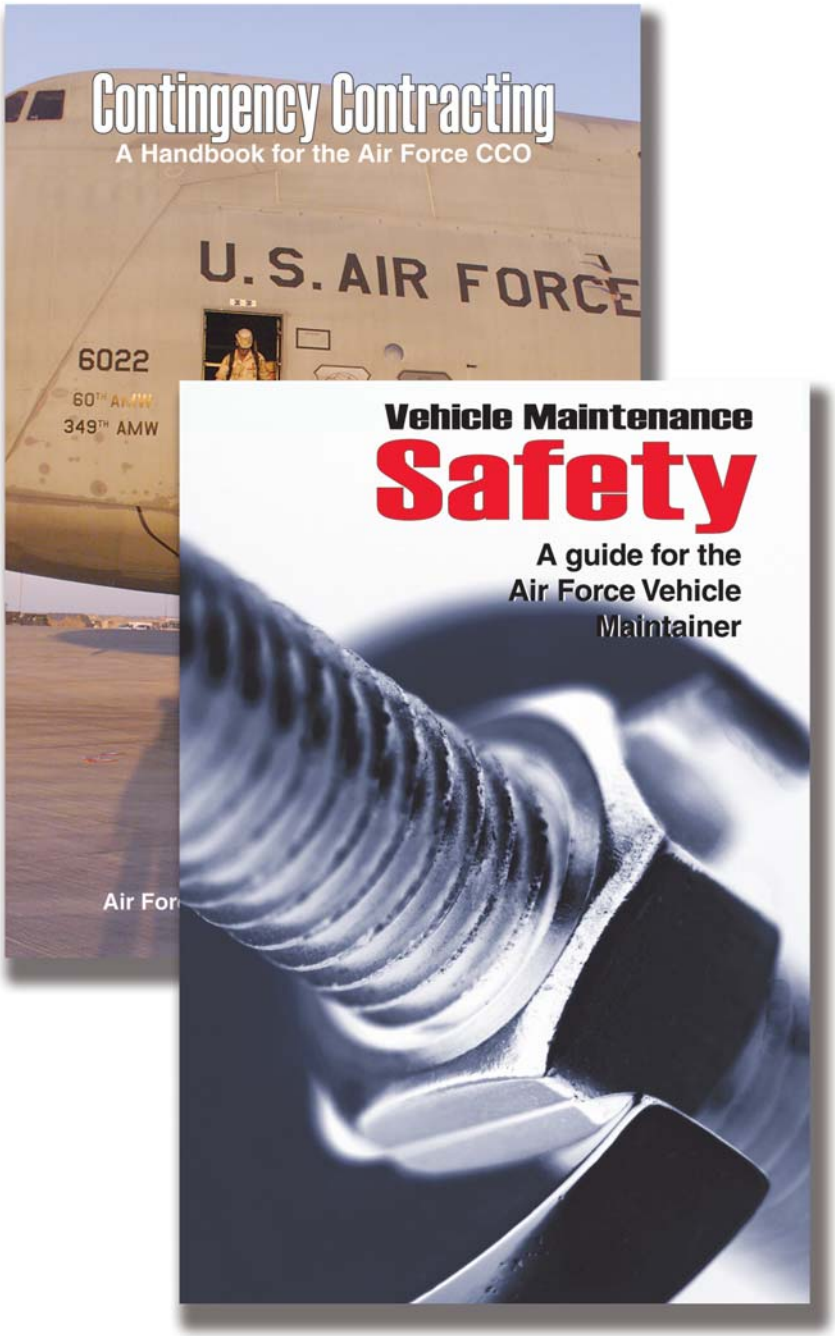

Critical ideas and information need to be presented in a crisp and clear format. If you look around at some of the things being produced today, that's not always the case. That's why AFLMA was asked to produce these works. *Vehicle Maintenance Safety* and *Contingency Contracting* are in high-impact format and meet defined Air Force needs. They're also publications that communicate and will be used where they're needed and when they're needed.

AFLMA

Generating Solutions Today, Shaping Tomorrow's Logistics

Captain Todd G. Groothuis

Readiness Reporting

War Reserve Materiel

According to Air Force Policy Directive 25-1, *War Reserve Materiel,* the Air Force war reserve materiel (WRM) program supports national strategy by acquiring, maintaining, and positioning WRM to meet objectives in Secretary of Defense planning guidance and approved implementing instructions.

Although Air Force Instruction 25-101, *War Reserve Materiel Program Guidance and Procedures,* provides extensive guidance on generating WRM requirements, maintaining WRM, managing WRM, and using WRM, it only contains one section on readiness reporting for WRM. Paragraph 2.7 describes procedures for bare-base readiness reporting using the Status of Resources and Training System (SORTS). WRM readiness reporting, therefore, differs from base to base and major command (MAJCOM) to MAJCOM; so in effect, there is no standardized method that provides high-level visibility for the Air Force.

The final conclusion the team reached is that LOGFAC or its next generation replacement could provide the best long-term solution, if funded, to eliminate usability issues and incorporate metrics.

In April 2001, Headquarters, Pacific Air Forces (PACAF) began readiness reporting on a basis similar to SORTS. PACAF subsequently took this initiative forward and briefed the Air Force WRM Executive Review Board (AFWERB) in August 2001. The AFWERB directed PACAF and the Air Force WRM Integrated Product Team to continue this reporting effort with a goal to leverage existing and emerging logistics information systems. The AFWERB acknowledged PACAF's reporting system as a *work in progress*.

PACAF then asked AFLMA for a study to improve the work accomplished to date. Ideally, the solution should be able to link WRM readiness quantitatively to sortie production and airlift savings.

During the pre-analysis portion of the study, the study team developed a problem statement that addressed the sponsor's dilemma: "There is no corporate standard for showing impact of WRM readiness to the warfighter." As the problem statement was prepared, the team further developed two objectives for the study. The first objective was to identify meaningful WRM metrics; the second objective was to develop an algorithm to tie WRM metrics to operational impact and cost (both cost to transport assets to theater and time-phased force deployment data closure impact).

The study evaluated a number of options for measuring the readiness of WRM stockpiles. These options were compared on the basis of system cost, usability, feasibility, and reliability in measuring the effectiveness of the WRM stockpile in meeting the using unit's Title X obligations. Following a preliminary screening phase, only five alternatives were identified as meriting further evaluation:

- **PACAF WRM Readiness Initiative.** This system has been in use since April 2001. In the PACAF system, there are three measurement areas: aircraft support, beddown, and airfield operations.
- **Logistics Feasibility Analysis Capability (LOGFAC) WRM Reports.** LOGFAC is a subsystem to the Contingency Operation and Mobility Planning and Execution System (COMPES). The LOGFAC subsystem of COMPES is designed and developed to support logistics and operational planning staffs at Headquarters Air Staff and at the MAJCOM and unit level.
- **Building WRM Unit Type Codes (UTC)**. A WRM UTC is simply a special case of equipment-only UTC. It is unique-only in that it consists of WRM assets rather than mobility assets. The management of WRM UTCs is no different from other UTCs and is governed by the same guidance. By developing WRM UTCs, readiness reporting in SORTS could be done in the same manner as most UTCs are reported today.
- **WRM Transportation and Inventory Tradeoff Optimizer (TITO).** WRM TITO is an AFLMA-developed WRM reporting system that assumes simple relationships between the PACAF WRM authorizations and the PACAF operations plan (OPLAN) sorties and then optimizes the tradeoff between prepositioned inventory and future airlift bills to meet various OPLAN sortie goals.
- **Prototype Support Equipment Requirements Generator (Proto-SERG).** Proto-SERG is a prototype discrete, event simulation developed by Air Force Materiel Command's Office of Aerospace Studies. Proto-SERG is designed to show the impact of WRM shortages on sortie generation rates at a given base.

After further evaluating these five alternatives, the team concluded that the current PACAF readiness reporting method is as good as SORTS but may not be quantitative enough to justify funding. Furthermore, the team determined that the best way to estimate monetary and transportation costs needed to fix WRM shortfalls continues to be case-by-case analysis using data available from the Standard Base Supply System and the type unit characteristics file, as demonstrated in WRM TITO.

As far as new systems are concerned, Proto-SERG is capable but limited in scope. To be useful as a WRM readiness-reporting tool, Proto-SERG needs to be augmented by WRM TITO or LOGFAC. Proto-SERG provides benefits beyond the study objectives. It has the ability to serve as a valid requirements generator, and its use could expand to other theaters. Locally, AFLMA plans to utilize Proto-SERG in the logistics analysis of Title X wargames and other analysis initiatives.

The final conclusion the team reached is that LOGFAC or its next generation replacement could provide the best long-term solution, if funded, to eliminate usability issues and incorporate metrics.

The onus of supply rests equally on the giver and the taker.

—General George S. Patton, Jr, USA

Logistics sets the campaign's operational limits.

—Joint Pub 1: Joint Warfare of the Armed Forces of the United States

I said to myself, I have things in my head that are not like what anyone has taught me—shapes and ideas so near to me—so natural to my way of being and thinking that it hasn't occurred to me to put them down. I decided to start anew, to strip away what I had been taught.

—Georgia O'Keeffe

The Situation:

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Need it figured out.

The Solution:

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Ms Stacey M. Almeter, ASC/ENMM

You Can't Get There without a TPFDD

Mobility Studies

The success of this effort goes far beyond the results of the study. For the first time ,a DPG scenario has a valid, feasible TPFDD with realistic deployments and basing. More important, a methodology and a mechanism have been put in place to develop future TPFDLs quickly as new scenarios are created.

AFLMA conducts studies for all aspects of logistics and Agile Combat Support. Normally, these studies come from within the five traditional functions of logistics: plans, transportation, supply, contracting, and maintenance, but occasionally, we receive a request to support an area that is a little different. This year, we were asked to support a multi-agency effort in the requirements definitions and feasibility arena. In conjunction with planners and analysts from Air Force Materiel Command (AFMC) and Air Mobility Command (AMC), we had the opportunity to *dig a little deeper* into determining the *true* requirements of an operational campaign.

The Air Force modeling, simulation, and analysis community is constantly studying how the airman can win the war, supporting decisionmakers on such things as force structure and future acquisitions. Analyses are performed using validated Defense Intelligence Agency, Defense Planning Guidance (DPG) scenarios. Scenarios often are built from a combat mindset, focusing on above-the-line elements (for example, aircraft, tanks, shooters, and so forth). This leads to study results that focus primarily on combat aircraft, missiles, and target kills. Recently, the focus has been turning more toward enablers and how they affect combat capability of the joint force. A key enabler for all fighting elements is logistics. The recent shift in thinking from a systems-focused (platforms) approach to an effects-based (capabilities) approach resulted in the establishment of the Capability Review and Risk Assessment (CRRA) and the formation of new concepts of operations (CONOPS). The first to be examined was the Global Strike CONOPS, defined as the "capabilities necessary to neutralize postulated anti-access capabilities of potential adversaries

and selected high-value targets."[1] This CONOPS focuses on the initial stage of a conflict, attacking key targets anywhere in the world on short notice.

As the Air Force set out to define and develop the Global Strike CONOPS, a number of issues needed to be addressed by the warfighter and the analytical community. One of these issues dealt with mobility support. The Aeronautical Systems Center (ASC), Aeronautical Enterprise Program Office (AAP) was directed in 2002 to conduct a task force capability study. The focus of this study was to analyze warfighting effects and capabilities needed to achieve them as the major factor of system acquisition and technology investment. A subset of this effort was a mobility assessment study. The study's objective was to assess the airlift and aerial refueling capabilities required to support the Global Strike CONOPS. Any deficiencies highlighted would be used to identify future acquisition strategies and critical technologies.[2] The Mobility Assessment Team was composed of AAP, the ASC Mobility Systems Program Office, the Modeling Simulation and Analysis Division, the Air Vehicles Directorate of the Air Force Research Laboratory, the Air Mobility Command (AMC) Plans and Programs Division, and the Air Force Studies and Analysis Agency.

The mobility assessment was to focus on two DPG scenarios. DPG scenario development is based on a validated multiservice force deployment developed by the National Air and Space Intelligence Center to identify forces and basing for both blue (allied) and red (enemy) in a particular scenario. Blue force flows are provided by Air Combat Command. As the nonmobility analysts quickly learned, a combat force flow is not a time-phased force deployment list (TPFDL). Force-flow descriptions do not contain the detailed information needed to support logistical underpinning; only combat elements are identified. No supporting elements or time-phased generation and deployment of these elements are contained, as are no withholds for other activities or sustainment of combat forces.

Performing a credible mobility analysis requires a high level of logistical fidelity. More detailed time-phased force deployment data (TPFDD) were needed to support the study, and this data generation is an extensive and complicated task. Currently, force deployment data are generated only to support operation plans and major wargames. Historically, it has not been generated to support DPG scenarios. Because of the lack of a valid TPFDD for the two current DPG scenarios modeled by the ASC Modeling, Simulation, and Analysis Division, the team decided to change the scenario selection for the analysis. A recently completed Title X joint wargame, Global Engagement VI (GE VI), included a validated, transportationally feasible TPFDL. The mobility assessment team decided to use GE VI as the first scenario. For the second scenario, the team agreed to use the GE VI deployment data as a template and use the RT-2 (DPG scenario) force flow as a guide to develop a TPFDL for the RT-2 scenario.

The Mobility Assessment Team contacted the AFLMA Logistics Plans Division to lead the RT-2 TPFDL development process. Working closely with AMC and ASC, AFLMA built a transportationally feasible TPFDD, in B-8 Joint Operation Planning and Execution System format, which fulfilled the requirements covering the expected duration of the global strike effort. This TPFDD served as the key analytical underpinning to support the mobility assessment performed by AMC. A secondary benefit of the TPFDD development was the insight provided by AFLMA on proposed beddown locations and staging base laydowns for the RT-2 scenario. Parameters such as ramp space, maximum aircraft on the ground, and fuel capabilities, as well as future forward airbase investment strategies were incorporated into the analysis. The lessons learned and analytical results were significantly more credible because of the use of a complete TPFDD. Finally, the study showed the impact of mobility capabilities and limitations on the force flow in subsequent operations.

The success of this effort goes far beyond the results of the study. For the first time, a DPG scenario has a valid, feasible TPFDD with realistic deployments and basing. More important, a methodology and a mechanism have been put in place to develop future TPFDLs quickly as new scenarios are created. While further effort is needed to improve the analytical tool set to make it more integrated, more accurate, and more inclusive of domains, the process used in this study establishes a starting point for future research. The team also found that process improvements to expedite TPFDD and air tasking order development should be examined. Finally, we need to pursue opportunities to leverage joint analyses and scenarios.

Notes

1. *Global Strike CONOPs*, ACC/XPS, 29 Sept 03 (Draft).
2. *Aeronautical Systems Center Task Force Capability Study Mobility Assessment Terms of Reference*, ASC/AAP, 17 Dec 02.

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Generating Solutions Today, Shaping Tomorrow's Logistics

Captain Jason L. Masciulli

The AMC System

Analyzing TP1/999 Shipments

During contingency operations, high-priority cargo, which often moves quickly during peacetime operations, piles up in warehouses and on ramp space waiting for movement. The challenge is to determine what stuff to move first.

In the movement of high-priority cargo during wartime, one organization is called upon to make it happen—the Air Mobility Command (AMC). The men and women of AMC often make the impossible happen by moving units and equipment halfway across the world in a matter of hours. However, during contingency operations, AMC customers often will send cargo to its aerial ports with a high priority (999) for movement. The problem is that many other customers often do the same thing, overloading the system with high-priority cargo. This results in backlogs of cargo at the ports, and aerial port personnel

CARGO

do their best to overcome the challenge. Because of this backlog, high-priority cargo, which often moves quickly during peacetime operations, piles up in warehouses and on ramp space waiting for movement. So the challenge is to determine what stuff to move out first. We are examining this challenge at the AFLMA in an ongoing study to look at the problem of Air Combat Command's (ACC) mission-capable (MICAP) items moving through the AMC system during wartime. This problem surfaced in Operations Desert Shield and Desert Storm and, more recently, during Operations Enduring Freedom and Iraqi Freedom.

A Government Accounting Office (GAO) report from 1993 highlighted this same problem during Desert Shield and Desert Storm. The data for 999 shipments during Desert Shield and Desert Storm were very similar to the situation that occurred during Enduring Freedom and Operation Iraqi Freedom. This report highlighted other problems and the fixes during that time period and recommended solutions for future contingency operations.

The numbers shown in Table 1 are very similar to what occurred during more recent operations. This leads to a great challenge as to determining what stuff should be moved first. The prevailing perception is that since most cargo is high-priority none of the cargo is a priority.

So we were tasked to look at the problem, specifically to see what could be done to ensure the right stuff moved first. ACC initially sanctioned this study to look at another way to prioritize its highest priority MICAPs ahead of other high-priority cargo in the AMC system.

After presenting the initial approach to this analysis, it was decided to look at all shipments moving through the AMC system that were labeled the highest priority. This cargo has a transportation priority (TP) of 1 and a required delivery date (RDD) of 999, which signifies delivery as soon as possible. Any piece of cargo with these designations is the highest priority that can be given to a shipment. With this, we decided to have cosponsorship of this study with the Headquarters Air Force Installations and Logistics, Directorate of Logistics Readiness.

We decided to first examine Air Force and Department of Defense (DoD) publications covering the prioritization of cargo in the Defense Transportation System (DTS). The primary one examined was the Defense Transportation Regulation. Others we looked at and compared are AMC Instruction 24-101, Volumes 9 and 11, and Air Force Instruction 24-201. We looked to see how cargo is prioritized within the DTS and whether or not there are inconsistencies between the publications with regard to assigning priorities to cargo. We also wanted to find out what procedures were in place for moving cargo once it is prioritized.

Month and Year	Dover AFB	Tinker AB
July 1990 (Pre-Desert Shield)	15	14
September 1990	50	44
November 1990	44	48
January 1991	64	53
February 1991	62	68

Table 1. Percentage of Cargo Coded 999 (GAO, 21)

After examining the policy and noting what is supposed to occur, we decided to see what really occurs. We traveled to Dover AFB, Delaware, and visited the 436th Aerial Port Squadron and the 436th Logistics Readiness Squadron. We talked to them about their procedures for receiving and prioritizing cargo. We also spoke to them about special handling of 999 cargo, along with how cargo is processed for airlift via the AMC channel system. We also spoke with the airlift clearance authorities for the Army and Air Force, colocated at Dover, to see how cargo can be expedited and prioritized via what is known as the *green sheet* process.

Once we finished at Dover, we sat down and looked at what metrics we wanted to use in determining solutions to the problems regarding 999 shipments in the AMC system. Once we finished that, we requested data from the Global Air Transportation and Execution System.

We received more than 3 million shipment records for cargo moving through the AMC system during two time periods: June to December 2001 and October 2002 to May 2003. These two time periods were chosen because they span the time from before deployment of forces to when combat began for Enduring Freedom and Iraqi Freedom. In these data, we wanted to see how much of the cargo was designated TP 1 with an RDD of 999. We also looked at how much of that cargo could have gone via the alternative means of Worldwide Express (WWX)—a small parcel contract the DoD has with air express carriers for international shipments. Another metric we wanted to examine is how long 999 shipments were held at aerial ports of embarkation (APOE). Finally, we wanted to compare how ACC 1A MICAPs moved compared to other 999 shipments in the AMC system.

With this analysis, we want to show how high-priority cargo moved before and during contingencies. We also want to show how WWX may help to alleviate the backlog at APOEs. We want to give decisionmakers and those who make policy information needed to implement new business rules to help move high-priority cargo faster. We plan to give ideas on new business rules in this study, to hopefully facilitate discussion and rewriting of policy. Overall, we hope this analysis will bring about the required changes to improve warfighter support by providing them with their highest priority cargo first.

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Captain Robert E. Overstreet

Logistics Officer Handbook

Roadmap Your Career

In September 1999, the Air Force Chief of Staff directed a top-to-bottom review of base-level logistics processes. As a result of that review, the logistics plans, transportation, and supply officer career fields were merged into the logistics readiness officer (LRO) career field. This new LRO concept necessitated an update to the *Logistics Officer Handbook* by the AFLMA Logistics Readiness Division.

The purpose of the handbook is to provide officers and officer candidates with information about education, training, and career opportunities available throughout a career in logistics readiness. This document touches on alternatives available for an individual wanting to become a career logistician.

The source material for this handbook is primarily Air Force instructions, manuals, pamphlets, and catalogs; career-field education and training plans; and Program Action Directive 02-05, *Implementation of the Chief of Staff of the Air Force Direction to Establish a New Combat Wing Organization Structure.* An entire section of this handbook is dedicated to listing and describing publications. We found that most of the references are available through World Wide Web sites. The final section in the handbook is dedicated to identifying those sites. The handbook is available only as an electronic document from the Headquarters Air Force Planning, Doctrine, and Wargames Division Website: https://www.il.hq.af.mil/download_file.cfm?file=8279992003ilgx.pdf

The purpose of the handbook is to provide officers and officer candidates with information about education, training, and career opportunities available throughout a career in logistics readiness.

The handbook is *not* intended to specify a career path that leads to *guaranteed* success. In fact, there is no one way to achieve personal and professional goals you have set for yourself. If you want to get promoted, you must do the best job you can in the position you currently are filling. Promotions are based on your duty performance and ability to perform in the next higher grade. However, we hope the handbook will provide guidance to help you roadmap your career as an Air Force logistics readiness officer.

Captain Frank W. Watson, Jr

Space-A Travel

System Capability Analysis

Space-available travel, or simply *Space A*, is one of the many perks of military service. What began as an attempt to use extra space on military vessels has evolved into what many perceive as a privilege or an entitlement. As such, there is often discussion about who may take advantage of this opportunity and why. Unfortunately, there is limited data available on the capacity of the Space-A system. This prevents intelligent decisionmaking and valid responses to congressional inquiries regarding the program.

Department of Defense (DoD) Directive 4515.13R, Chapter 6, defines Space-A travel. It allows authorized passengers to occupy surplus DoD aircraft seats after all space-required passengers are accommodated. It dictates that there be no mission interference, additional aircraft, funds, or flying hours used to accommodate Space-A passengers. In January 2002, the Headquarters Air Force Personal Property and Passenger Management Division submitted a request for a Space-A baseline capacity study because it did not have valid information to respond to congressional inquiries about expanding the system. In February 2003, DoD announced a Space-A expansion test: dependents could fly with their sponsor within the continental United States.

The contracted Patriot Express missions are fairly accurate as the contracts are written to provide a certain capacity per month. Unfortunately, these numbers are far more difficult to capture for the organic military flights that have no obligation to provide a certain number of seats on any given mission. Therefore, the ACLs are highly variable and possibly suspect.

With these factors in mind, the Air Staff tasked AFLMA to conduct a study to determine the actual number of seats that have been available annually to Space-A passengers; plot the number of passengers by Air Mobility Command (AMC) terminal and by month based on the historical data; identify instances where certain destinations prohibit Space-A travel even when capacity exists; research current population figures for disabled veterans, military widows, family members (of active and retired), retirees, and DoD civilians; and determine growth trends for all these categories to determine potential demand.

Clouding the issue is the possibility that Patriot Express, a program that contracts flights specifically for the

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Government and is a major source of Space-A seats, will be reduced in the next couple of years. The study will also look at how such a reduction will impact capacity of the system.

Unfortunately, the project will not be as simple as collecting and analyzing data. We plan to gather data from the Global Air Transportation Execution System through AMC. Specifically, we plan to look at the allowable cabin load (ACL) and numbers of space required and Space-A passengers. The ACL is the number of passengers that could be put onto an airplane. Space required passengers have orders for the flight and must be given a seat on the airplane. Space-A passengers, on the other hand, do not have orders and have seating priority based on DoDD 4515.13R. However, there are several issues regarding the way the Air Force collects data that will affect the outcome of the study. For instance, ACL for the contracted Patriot Express missions are fairly accurate as the contracts are written to provide a certain capacity per month. Unfortunately, these numbers are far more difficult to capture for the organic military flights that have no obligation to provide a certain number of seats on any given mission. Therefore, the ACLs are highly variable and possibly suspect.

The study will attempt to make sense of these numbers and provide decisionmakers with current information for recommendations on legislative proposals and congressional inquiries concerning the Space-A system.

This information will be beneficial for AMC, US Transportation Command, Air Staff, and Office of the Secretary of Defense-level policy makers as they make decisions about the future of Space-A travel.

The combination of slower modernization rates and a rapidly changing threat environment makes long-range planning more difficult and more important.

—General John Shalikashvili, USA

War is an ugly thing, but not the ugliest of things. The decayed and degraded state of moral and patriotic feeling which thinks that nothing is worth war is much worse. The person who has nothing for which he is willing to fight, nothing which is more important than his own personal safety, is a miserable creature and has no chance of being free unless made and kept so by the exertions of better men than himself.

—John Stuart Mill

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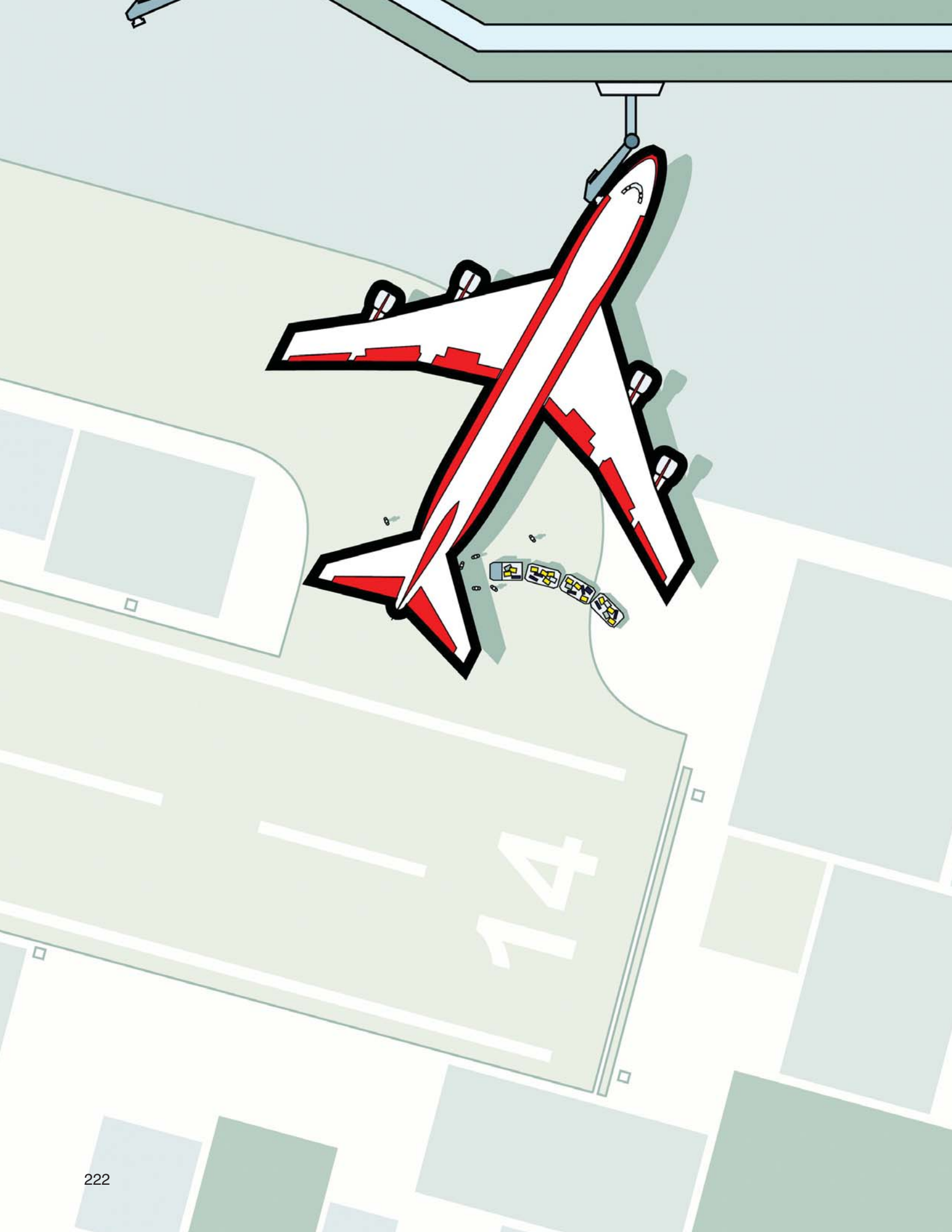
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An Analysis of Options

Ramstein Superhub

Efforts to improve the superhub concept would lead to better system integration among the aerial port, TDC, and shipping activities. The synergy of improving cargo processing and information sharing inevitably will increase cargo and information velocity.

Master Sergeant Daniel J. Bender

What do you do when you have an overseas theater with one major aerial port supporting multiservices of more than 90 shipping activities throughout one region made up of several commands? Trying to visualize that concept and determining who falls under whom in the chain of command is bad enough. The fact that different services use different systems to move cargo without a seamless interface contributes to the chaos of cargo movement in the European theater.

Don't get me wrong, the cargo is being moved in a timely manner within its required timeframe. However, the process of moving cargo is belabored because there are process owners that work for different commands using their unique systems and following different procedures. There is a lack of ability to control synergy among theater transportation, movement control, and traffic management agencies, resulting in suboptimal theater mobility capabilities. A strategic distribution capability at Ramstein AB, Germany, lends itself to tremendous potential velocity improvements if communications and operations can be streamlined. This concept would integrate command and control, surface distribution, and air distribution to facilitate cargo movement. An aerial port, Ramstein superhub can be conceptualized to make this happen.

By identifying process improvement opportunities at Ramstein, efficiencies can be maximized to facilitate cargo movement. Efficiencies could be gained through improvements among systems and organizations and possible realignment of the current structure.

A surface superhub at the theater distribution center (TDC) in Kaiserslautern has been in operation for years. The TDC is a hub and spoke system much like Federal

Express (FedEx) or United Parcel Service (UPS). Operating 24 hours a day, 7 days a week, its claim to fame is the last truck pulls in by 2200 and all cargo is sorted and delivered to any of its 93 spokes by 0900 the next day. However, unlike FedEx or UPS, the TDC only operates the surface portion of distribution. With the Ramstein aerial port only 20 minutes away, it is obvious that synergies can be made between both the surface hub and the aerial hub. After all, that is what makes FedEx and UPS successful.

An added bonus, besides the increased velocity of cargo, is that resources can be maximized. Currently, the aerial port and the Air Terminal Movement Control Team work together to distribute cargo to its destination wherever possible by direct modes or through the TDC for smaller loads. In cases where the cargo is delivered to the TDC, it is rehandled and distributed through the TDC hub and spoke system. In cases where cargo is delivered directly to its destination, the TDC probably had a truck going to that destination already. In addition, Air Force installations in Germany currently have dedicated trucks that are spotted at the aerial port and base and have daily runs between the two. The common thread is that all these destinations are part of the spoke system at the TDC. Moreover, in most cases, the trucks that support all these requirements come from the same Army transportation company.

It is hard not to realize that, if the two hubs worked together through dedicated transportation that moved cargo between them, only one location would have to distribute cargo to cover all spokes. This results in minimizing trucking requirements while maximizing distribution. The handling and processing of cargo and paperwork would be contained centrally between the two hubs, reducing manpower considerably.

Efforts made to improve the superhub concept would lead to better system integration among the aerial port, TDC, and shipping activities. The synergy of improving cargo processing and information sharing inevitably will increase cargo and information velocity. After all, no matter whom you work for, what uniform you wear, or what system you use, the most efficient process of moving cargo to its destination is the bottom line.

We need to continue the transition from a threat-based Cold War garrison force, focused on containment, to a capabilities-based expeditionary force focused on responsiveness.

—General Michael Ryan, USAF

Teamwork allows us to be an effective fighting force—a rapid expeditionary force capable of deploying anywhere in the world in a minimum of time and in austere conditions—not operating from where we are stationed, but from where we are needed, not when we can, but when we must.

—General Michael Ryan, USAF

Leaders win through logistics. Vision, sure. Strategy, yes. But when you go to war, you need to have both toilet paper and bullets at the right place at the right time. In other words, you must win through superior logistics.

—Tom Peters

Computer science is no more about computers than astronomy is about telescopes.

—E. W. Dijkstra

Surprise is good when the other guy can't deal with it. Let us try never to be that other guy.

—Deputy Secretary of Defense Paul Wolfowitz

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Ingenuity and creativity go hand in hand. They help us support a diverse—flight line to headquarters—customer base and take on and solve the toughest logistics problems facing the Air Force. They also help us develop the high-quality, tailored solutions our customers, partners, and competitors have come to know.

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AFLOAT prepositioning

Phase II

Captain Todd G. Groothuis

Introduction

In last year's *Year in Review*, we introduced a study that was underway called "Afloat Prepositioning." Building on a previous study by Captain Paul E. Boley, which provided a cost-benefit analysis for afloat prepositioning of nonmunitions war reserve materiel (WRM), this study narrows the focus and examines the impact to US Air Forces, US Central Command (CENTAF) from placing a portion of its assets on a ship. As Phase II of the project evolved, the requirement for two bare bases afloat became evident through discussion with the CENTAF staff. With this as a starting point, the effort turned to operational plans (OPLAN) analysis.

Analysis

Since the movement of bare-base assets is tied to OPLAN time-phased force deployment data, the study team conducted a head-to-head comparison of materiel movement—afloat versus land. In the land movement phase, assets were airlifted from their land-based point of origin to eight classified locations in the US Central Command

area of operations. For the afloat analysis, ships were moved to a deep-water port where they spent 5 days offloading and processing for further movement. Then all the equipment was loaded onto an organic surface movement capability, consisting of 12 tractor-trailers, and moved to the same eight final destinations.

Results

The results were spectacular. Even with a restricted line-haul capability, the assets moved in the afloat option delivered 100 percent of the assets to their destination by the required delivery date to six of the eight locations with a mere 7 days of strategic warning. When the artificial line-haul constraint was lifted, the other two bases could be fully equipped prior to the required delivery date by using existing theater rail.

Conclusion

Putting a portion of CENTAF's nonmunitions WRM afloat carries some degree of risk, but the benefits outweigh the risk. When ambiguous warning is introduced, afloat closure times are accelerated much quicker than airlift times. An inherent advantage of sealift is that the ship can loiter offshore for weeks awaiting the operations order execution. Cost aside, afloat prepositioning seems to be the best strategy for ensuring a rapid deployment and buildup of bare-base capability; however, as cost becomes more of a factor, theater sealift emerges as an economical alternative that adds roughly 5 days to closure.

In modern time it is a poorly qualified strategist or naval commander who is not equipped by training and experience to evaluate logistic factors or to superintend logistic operations.

—Duncan S. Ballantine

Technology is a way of organizing the universe so that man doesn't have to experience it.

—Max Frisch

Logistic considerations belong not only in the highest echelons of military planning during the process of preparation for war and for specific wartime operations, but may well become the controlling element with relation to timing and successful operation.

—Vice Admiral Oscar C. Badger, USN

Statistics: The only science that enables different experts using the same figures to draw different conclusions.

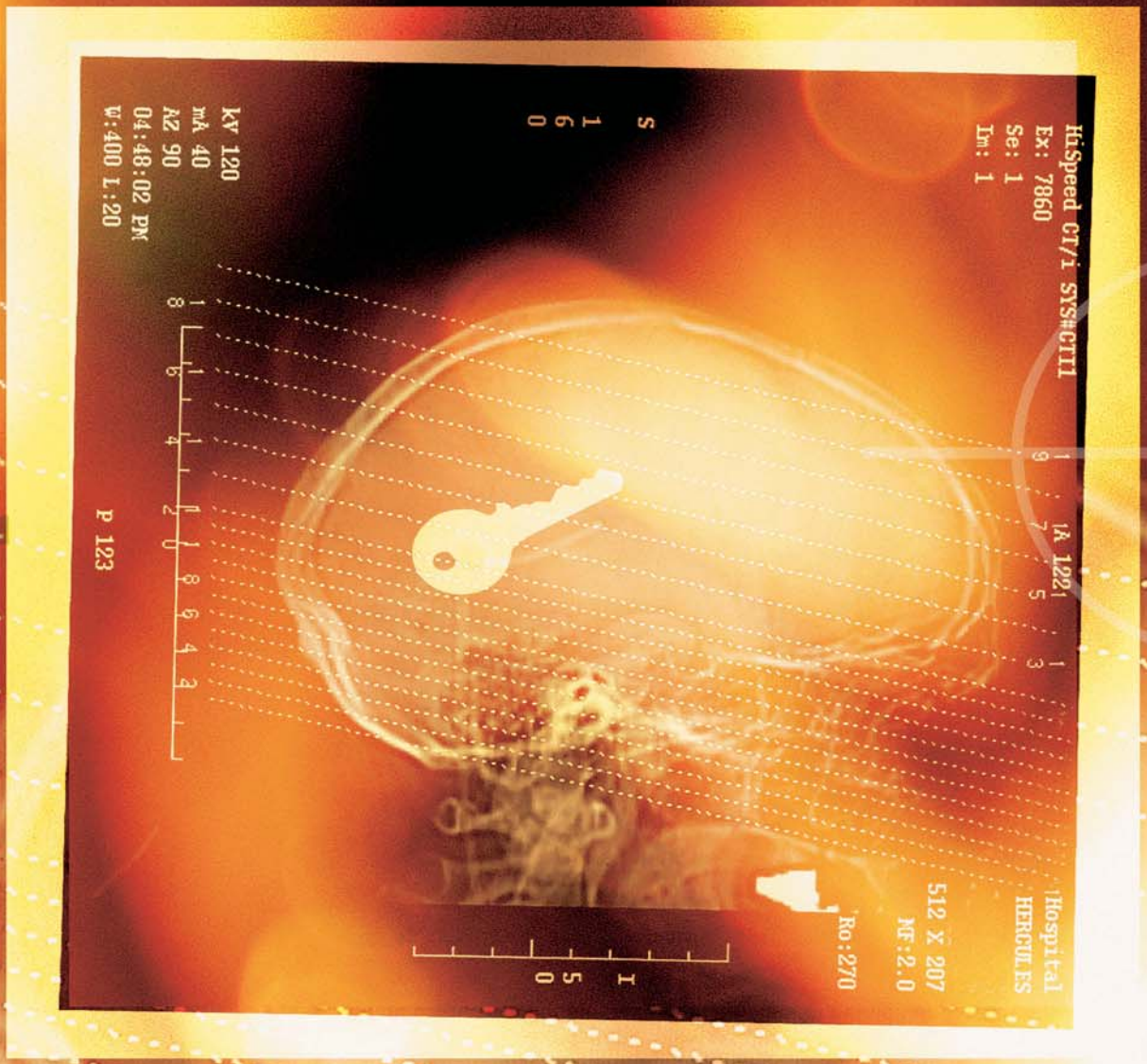
—Evan Essar

That must have a single, ultimate objective in which all particular aims are recorded.

—Clausewitz

You think out every possible development and decide on the way to deal with the situation created. One of these developments occurs; you put your plan in operation, and everyone says, "What genius…" whereas the credit is really due to the labor of preparation.

—Marshal of France Ferdinand Foch



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Senior Master Sergeant Alan L. Lindsay

Determining Requirements

Air Force Vehicles

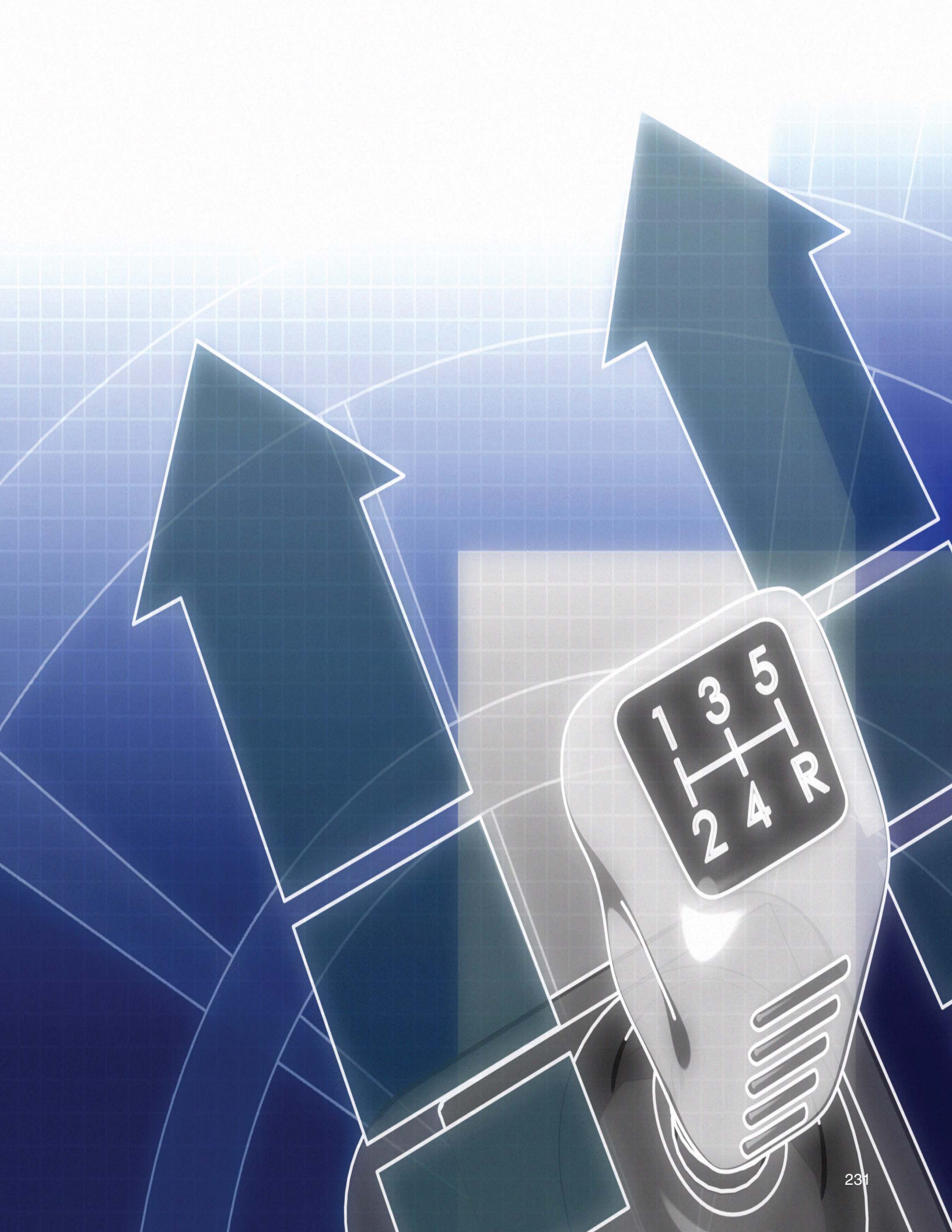
We limited our analysis of vehicles to the requirements process and whether it is in need of updating or changing. However, to validate the perception that the process needs to be fixed, we also had to address the reported number of assigned vehicles, comparing it to the reported number of vehicle authorizations. In doing so, we noted potential problems with data for both authorized and assigned vehicles in the data systems involved.

Background

Despite a proclaimed shortage of assigned vehicles, the Air Force mission seems to be accomplished, implying assets on hand are sufficient. If so, are vehicle requirements overstated, or are there flaws in the requirements determination process? Air Force senior leadership has questioned the accuracy and adequacy of the vehicle determination process. Vehicle procurement requirements are increasing; yet, we cannot articulate the *pain* associated with not procuring the vehicles. Funding remains at only 5-7 percent of requirements, but vehicle in-commission rates remain constant at 90-95 percent. Our objectives were to determine if problems exist in the vehicle requirements determination process and, if necessary, propose alternatives.

The vehicle requirements determination process is used to determine how many vehicles are required to perform a typical or specific mission, at a typical or specific location, based on selected parameters of the mission and site. This process generates a list or table of the number of vehicles authorized for a given mission. Approved vehicle requirements become vehicle authorizations, identified on a vehicle authorization listing (VAL). The VAL is a supporting document for the procurement process for the registered vehicle fleet. Each major command (MAJCOM) VAL lists the approved authorizations for its bases. Base fleet managers must reflect accurately vehicles authorized and assigned in the Registered Equipment Management System (REMS), the *accountable* data system for Air Force registered equipment. Data in REMS are then reflected in the Air Force Equipment Management System (AFEMS). Warner Robins Air Logistics Center (WR-ALC) pulls the AFEMS vehicle data to determine overall vehicle buy requirements.

Allowance Standard (AS) 019 identifies core vehicle allowances common to all Air Force commands. AS 020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through 034 are core allowances unique to specific MAJCOMs. These allowance standards are guides to how many vehicles may be authorized in a specific situation but are not authorizations for the vehicle types and quantities listed.

Scope

We limited our analysis of vehicles to the requirements process and whether it is in need of updating or changing. However, to validate the perception that the process needs to be fixed, we also had to address the reported number of assigned vehicles, comparing it to the reported number of vehicle authorizations. In doing so, we noted potential problems with data for both authorized and assigned vehicles in the data systems involved. While we limited our analysis to the authorization and requirements process, our conclusions and recommendations addressed the apparent need to review the process for entering and maintaining data on assigned vehicles.

Assumptions

The views of experienced MAJCOM fleet managers provided, from a user's perspective, valuable and accurate information on the overall process and how it might be improved.

Existing regulations and publications provided an accurate, initial picture of how the process should operate today; MAJCOM representatives reviewed our summary of the process for accuracy in how it was actually being conducted.

Summary of Analysis

The study began by looking at the perception of a vehicle shortage. The Air Force accountable system for vehicles is REMS, and REMS data are reflected in AFEMS. Data collected in September 2002 from AFEMS indicated the Air Force was 13,073 vehicles short against authorizations. Further analysis of other data systems showed the shortage might not be nearly as great as indicated. MAJCOM VALs are the source document for base fleet managers who populate REMS authorized vehicle data, and they are updated in AFEMS. The following data collected in September 2002 show other data systems did not reflect MAJCOM VAL totals, which caused vehicle shortage data to be overstated (Table 1).

Assigned vehicle data were questionable as well; AFEMS indicated 84,599 vehicles are assigned. From the WR-ALC Command Air Force Vehicle Information Management System (CAFVIMS) quarterly and annual lease vehicle reports, we showed 89,312 vehicles assigned. Using MAJCOM VAL data and assigned vehicle data from WR-ALC, we determined the vehicle shortage to be 5,015.

Data Source	Authorized Quantity
MAJCOM VAL (source data)	94,327
REMS SBSS databank	100,217
REMS (as seen in AFEMS)	97,672
AFEMS RVAL	88,027

Table 1. Vehicle Shortage Data Overstated

AFEMS also provides edit checks for the data it receives and makes discrepancies available to the originating MAJCOM and base fleet managers for correction. Failed edit records are identified as either rejects or variances. It is critical that fleet managers correct the discrepancies, which help ensure requirement totals correctly match the VAL.

There are questionable data in the systems, although Air Force Instruction (AFI) 24-301, paragraph 6.1, directs the data be reported accurately: "Air Force motor vehicles are selectively managed by HQ USAF and must be reported accurately in the Registered Equipment Management System reportable assets." MAJCOM VALs show total authorized and all other systems should reflect the same number, since the MAJCOM is the final approval for authorizations, except in rare circumstances. Differences between MAJCOM VALs and the requirements vehicle authorization listing are a result of MAJCOM fleet managers not loading the VAL to AFEMS or not always correcting the rejects and variances. Differences between MAJCOM VALs and REMS are a result of base fleet managers not accurately loading requirements. The data discrepancy between REMS (SBSS databank) and AFEMS are 2,545 authorizations (REMS 100,217 less AFEMS 97,672). Because of time constraints, a comparison of the records was not accomplished, and we were not able to determine if the difference was isolated or spread out among the commands.

Every requirement listed on MAJCOM VALs must cite an allowance standard. Allowance standards have evolved to give better visibility of the functional areas supported by the basis of issue (BOI). The allowance identifier, if used as outlined in the preface of AS 019, can identify the requirement to a functional area. Core allowances do not define a recommended BOI for every mission application code or national stock number, but where BOIs do exist, they were cited 63 percent of the time. The MAJCOMs overwhelmingly agreed that core allowance standards help support the requested requirement, as well as eliminate the extra step of creating MAJCOM-unique BOIs. Because Air Force core allowances have not been reviewed or validated in several years, they may be outdated and inaccurate. Few MAJCOMs have created core allowances, but when they did, they were in common Air Force functional areas (for example, security forces and communications) among their bases.

Analysis of allowance identifiers showed the preface guidance in AS 019 was not always followed. The Air National Guard provided a methodology for using allowance identifiers, in particular mission exception codes, to tie requirements to end items. This could be useful in ongoing Air Force efforts to better identify and justify

mission critical vehicle requirements. Mission application codes need to be updated to reflect the Air Force's new organizational structure.

Our benchmarking efforts did not provide any potential new or improved methods for determining vehicle requirements. However, our visit with the Air Force Civil Engineer Support Agency did provide useful information on usage of the allowance standards, including some potential problems users might have.

Conclusions

- The perception of vehicle shortages is clouded because requirements and assets on hand were not reported accurately.
  - MAJCOM vehicle authorization listings were not reflected correctly in AFEMS.
  - Base fleet managers were not inputting requirements accurately in REMS (Air Force accountable system).
  - Registration numbers of vehicles on hand and vehicle totals did not match between REMS and CAFVIMS.
  - Annual vehicle lease report totals did not match data being reported in REMS.
- The process for establishing or changing vehicle authorizations is adequate, and the MAJCOM VAL reflects approved authorizations.
- The bases of issue in AS 019 was cited, when available, to establish requirements, but:
  - MAJCOMs believed more core allowance standards (common to all) should be established to help reduce the number of MAJCOM-unique allowances.
  - They may be outdated and inaccurate since they have not been reviewed in several years.
- Allowance standard-mission application and mission-exception codes were not always developed and used in accordance with the guidance in the AS 019 preface.
- There are no guidelines for MAJCOM vehicle validation reviews, even though they are key to ensuring the base fleets are rightsized for their missions.
- There is a lack of understanding of AFEMS procedures and the oversight AFEMS can provide.
  - The manual for the Online Vehicle Management System (OLVIMS) MAJCOM module provides no guidance for the AFEMS and MAJCOM VAL interface.
  - Vehicle rejects and variances were not always cleared at MAJCOM and base levels.
  - MAJCOM personnel were not aware of the AFEMS oversight capability for base-level reporting.
  - Vehicle allowance standards are partially automated, but navigating through the bases of issue can be difficult in AFEMS and Allowance Standard Retrieval System CD-ROM for first-time or occasional users.
- AFI 24-301:
  - Directs accuracy of reporting and emphasizes correcting AFEMS rejects and variances.
  - Requires minor updates to reflect AFEMS terminology.
  - Does not address the AFEMS weekly Utility Report.
- Modernized OLVIMS, fielded as a single database, will eliminate the need to update and reconcile the different OLVIMS modules currently being used.
- Limited benchmarking efforts revealed no significant ways to improve the Air Force process.

Recommendations

- Require MAJCOM fleet managers to conduct an annual accountability review of base-level vehicle authorizations reported in REMS (AFEMS ACAL screen provides a view of base-level reporting).
- Request an audit to identify problem areas in asset reporting.
- Retain the current process for requesting new vehicle authorizations, with minor improvements in guidance on conducting the process, and a review of the currency and accuracy of the allowance standards, as noted in subsequent recommendations.
- Develop an objective process for reviewing existing and developing new allowance standards.
- Update allowance standards to reflect the new Air Force organizational structure and incorporate more Air Force core allowances to replace existing MAJCOM-created allowances.
- Accomplish a periodic (3-4 years) review of allowance standards.
- Review use and definition of the mission-application and mission-exception codes to provide accurate identification of the requirement and optimum usefulness of the information.
- Establish standardized guidance for conducting vehicle validation visits to provide a basic objective review for the requirements.
- The how-to and whys of AFEMS interfaces with OLVIMS MAJCOM and fleet management modules should be established; add to either policy (AFI 24-301) or OLVIMS system manuals.
- Composition of the allowance identifier and how to search for them in BOI tables needs to be explained in either policy (AFI 24-301) or OLVIMS system manuals.
- AFI 24-301 needs to emphasize that the following be accomplished with 100-percent accuracy:
  - Reporting of MAJCOM VAL to AFEMS
  - Base-level reporting in REMS
  - Clearing rejects and variances, including those identified in the weekly AFEMS utility report
- Once modernized OLVIMS is operational:
  - Establish an automated feed of the MAJCOM VAL to AFEMS.
  - Have MAJCOM and base-level rejects and variances feed into modernized OLVIMS database for easier access by vehicle managers.

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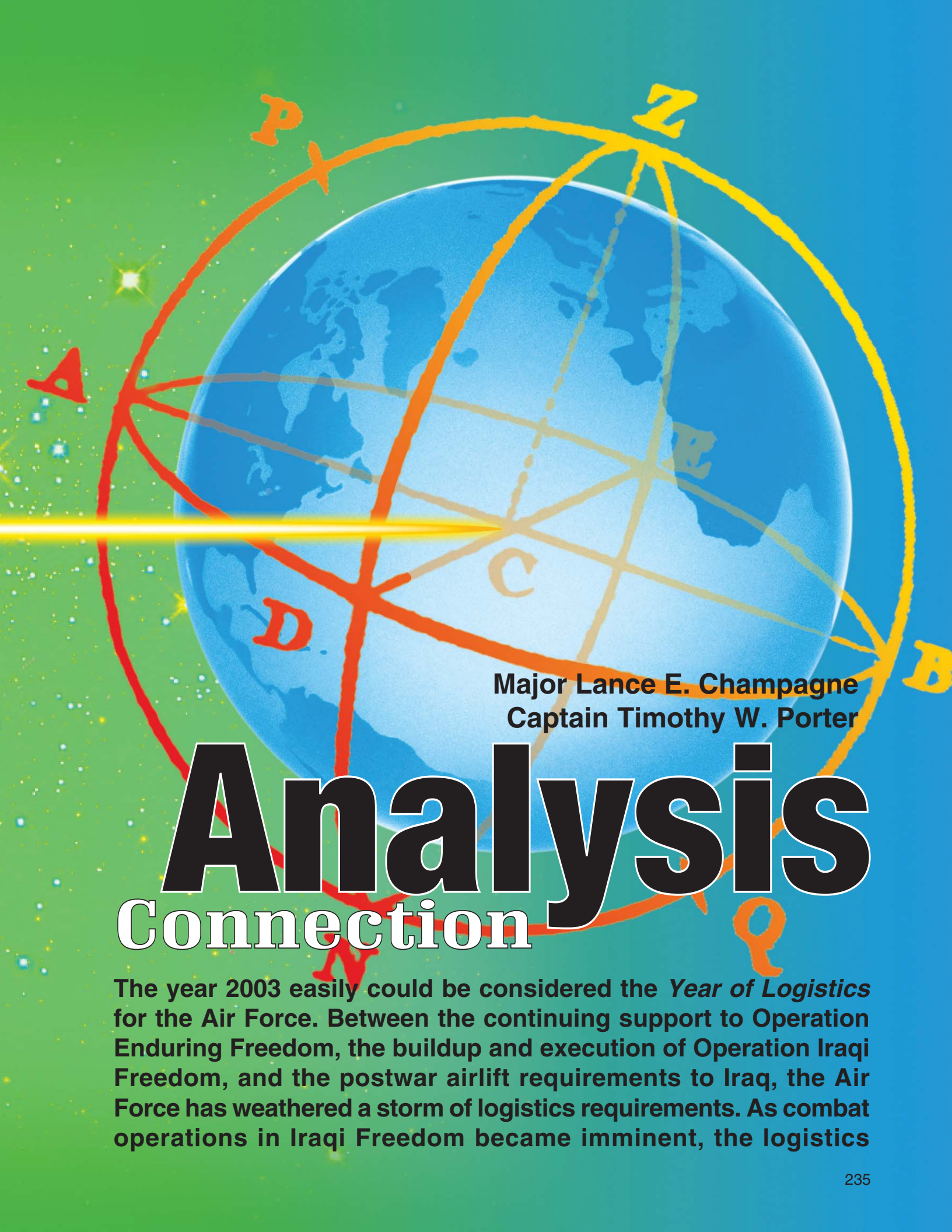

Major Lance E. Champagne
Captain Timothy W. Porter

Analysis Connection

The year 2003 easily could be considered the *Year of Logistics* for the Air Force. Between the continuing support to Operation Enduring Freedom, the buildup and execution of Operation Iraqi Freedom, and the postwar airlift requirements to Iraq, the Air Force has weathered a storm of logistics requirements. As combat operations in Iraqi Freedom became imminent, the logistics

portion of the war was already well underway. Whether through studies conducted after the beginning of Enduring Freedom or analysis in the final days and weeks before the kickoff of combat operations, AFLMA, supported by the Analysis Division, helped ensure *the pointy end of the spear* had the shaft it needed.

AFLMA's mission today is to increase Air Force readiness and combat capability by enhancing logistics efficiency and effectiveness. The primary way we meet this mission is by conducting high-quality studies and analyses requested by senior logistics leaders throughout the Air Force. Our mission in the Logistics Analysis and Support Division is to support our functional divisions—Supply, Maintenance, Contracting, and Logistics Readiness—with any and all analysis, network, and computer support needed.

The Logistics Analysis and Support Division is organized into two branches, Operations Research (OR) and Systems Engineering. The OR Branch is manned with professional analysts who have advanced academic degrees in mathematics or operations research and are trained to conduct high-quality technical studies. Those who have not yet received their advanced academic degrees have had their training augmented through formal short courses such as the Air Force Operations Research Familiarization Course sponsored by the Air Force Studies and Analysis Agency.

Our ability to meet the needs of the functional divisions also is enhanced through a continuing program of in-house training; a new formalized, comprehensive, and rigorous review process; and the aptly named *LGY Lecture Series*. This series of presentations is given to the program managers by the analysts to keep them up to date on the analytical tools the division can provide. As we educate the program managers on what we have to offer, we strengthen the tie between analyst and project manager. They work as a more cohesive team. As a result, the OR Branch is able to meet the demands of all AFLMA's functional experts, as well as provide outside support.

OR Branch

Supply

Just as 2003 could be the *Year of Logistics* for the Air Force, it also can be the *Year of RBL* for the analytical support to the Supply Division. RBL (readiness-based leveling) is a computer program that sets levels for reparable parts at bases worldwide. A base may be authorized—that is, have a level—to stock five widgets but actually have only four widgets on hand. The objective of RBL is to minimize worldwide expected back orders (do I get the part when I ask for it?). It is not possible to have everything we need everywhere we need it, so RBL attempts to minimize the total impact of shortages across the entire Air Force. This is akin to ensuring that your body is feeling dozens of tiny pinpricks rather than one large incapacitating pain in your right leg—you can still walk, run, and fight, even if you are a bit annoyed.

The Air Force uses RBL on a quarterly basis to update reparable levels at the bases. This quarterly run of the program (referred to as a *push* or *comp*) is run at Wright-Patterson AFB, Ohio. AFLMA analysts download the resulting data for analysis and validation. While this may seem like a fairly automated system, it is not. RBL is a dynamic program that is updated constantly for changes in Air Force policy and improvements in the program itself. These changes must be verified and validated by the division analysts.

The RBL program is used for far more than just the quarterly *push* of levels. While normal peacetime levels are generally sufficient for Air Force needs, it often is necessary to position additional assets to support contingencies and the buildup for operations. In these cases, the major commands will make a contingency high-priority mission support kit (CHPMSK) request. In 2003, the analysts reviewed 25 (CHPMSK) requests impacting nearly $150M of reparable parts. More than half these were in preparation for and support of Iraqi Freedom.

RBL also is used to assist in the analysis of some of the projects conducted by AFLMA. In 2003, analysts assisted the Supply Division in reconciling the adjusted stock levels in two separate databases. This effort, conducted twice in the year, investigated more than 108,000 records in the two databases and discovered only 58,500 perfectly matched records. This represents nearly a 50-percent error rate in the data. Within the RBL program, it is possible some bases that have a demand for an item are not authorized any levels for that item. In these cases, any new need for the part must be filled from the depot. RBL was used to analyze the effect of allowing every user in the Air Force with positive demand for an item at least at one level. The resulting impact to the Air Force would have increased the worldwide expected back orders substantially. That is, bases, as a whole, generally would have to wait longer to get a needed part. More important than this is that the Air Force would have to invest $62.7M in new assets just to make this possible.

Maintenance

While the analysts in the OR Branch bring a wide and varied array of tools and techniques to a problem, their greatest contribution is often their ability to provide an analytical structure to a problem. This has been the case when supporting the Maintenance Division this year. As weapon systems and technology change, so must Air Force maintenance requirements.

Low-observable material is becoming a larger part of the workload when dealing with airframe maintenance. Unfortunately, it is still a small part of the training. AFLMA's maintainers were asked to look into the best way to structure the airframe maintenance career field to better handle the growing need for low-observable maintenance. Our analysts helped structure this as a decision analysis problem. They were able to identify specific data needs and pull from subject-matter experts the important issues involved in managing a career field. This structure helped identify and choose the best alternative.

Similarly, the success of the Predator during Enduring Freedom has ensured that the unmanned aerial vehicle (UAV) will be an ever-growing part of the Air Force fleet. There is, however, no single designated and dedicated UAV maintenance Air Force specialty code (AFSC). The operational instructions dictate that space and missile maintainers should service UAVs, but the work is actually being done by F-16 and A-10 maintainers. The question was simple, "Who should maintain our UAVs?" The answer is not simple. The analysts have been able to structure the project as a large assignment problem using the specific tasks that each potential AFSC can perform. These tasks will be matched against the tasks needed for UAV maintenance. The most appropriate or best fitting AFSC or combination of AFSCs can be identified from this problem. These possible alternatives then will be evaluated using a multi-objective decision analysis approach.

Contracting

Maintenance was not the only area of logistics that benefited from our analysts' abilities to structure problems. In a consulting project undertaken in conjunction with Headquarters Air Force Materiel Command, the AFLMA Contracting Division assessed the level of pricing expertise currently demonstrated by the Air Force contracting community. The project team, including the analysts, developed an assessment tool that combined a general test of pricing knowledge, an extensive set of demographic questions, and a survey of pricing-related training and issues. Throughout the construction of this tool, the analysts ensured that it was logically consistent and the resulting data would be sufficient to provide insight into the fundamental questions being asked. Once the tool had been fielded and the data gathered, the analysts used a number of statistical techniques to identify trends and provide insight into the pricing abilities of the workforce and the working environment.

Finding trends in data was also one of the goals of the Spend Analysis of Operational Contracting project. The data from operational contracts awarded were analyzed to identify Air Force spending patterns. The contracts were analyzed by contractor, location, type of good, or service purchased, as well as other relevant factors. This analysis allows the Air Force to target possible goods or services to be consolidated at specific locations and take advantage of the benefits of buying in bulk. A program based on the methodology for analyzing the data was developed and subsequently used in determining the best location for several of these consolidated purchase centers.

Logistics Readiness

Logistics Readiness was asked to look at the superhub concept for Ramstein AB, Germany, and the Kaiserslautern military community. Ramstein is a large transshipment node for cargo coming into or leaving the area by air. Currently, the physical flow of cargo is believed to be inefficient and not completely linked to the data flow. Analysts are working with Ramstein to flowchart both these processes to identify unnecessary redundancies and capability gaps in the system.

Unfortunately, the transition from one section of logistics to another is not always seamless. This is the case when looking at the priority of cargo as it transfers hands from supply to transportation. The Air Force supply system has a very detailed priority system that gives those items that keep aircraft grounded (mission capability [MICAP]) the highest possible priority. The transportation system, however, has a much simpler priority system with rules that make it possible for nonessential cargo, such as gym equipment, to receive an equally high priority. This disconnect in systems can result in a MICAP part having the same priority (in the transportation system) as a more routine shipment. Air Combat Command (ACC) asked AFLMA to assess whether its MICAPs are traveling slower than other high-priority shipments. The analysts were able to use shipping data and nonparametric statistics to show that ACC's concerns are well-founded, and its MICAPs are, in fact, traveling slower than far less essential material.

The Logistics Readiness Division also encompasses AFLMA's participation in wargames and exercises. We provide support to Title X and supporting wargames throughout the year. As a part of the pregame process to the Title X wargames, the Global Mobility Wargame focuses on the logistics issues involved. Our analysis support for all these games falls into several areas. From a purely logistics standpoint, we look at beddown analysis of assets and movement of assets into a theater of operations. We support the analysis for mobility and sustainment for the games. AFLMA also supports the planning phases with time-phased force deployment data reviews and general campaign planning, as well as providing subject-matter experts. Once the game begins, our analysts continue to support the efforts by assisting with the mechanics of the event. Some of the largest contributions come from the postgame analysis and investigation into the impact on logistics from the decisions made during the wargames.

Systems Engineering Branch

The five members of the Information Technology Branch are responsible for acquiring and maintaining the AFLMA information system network hardware and software resources and for building and maintaining databases used by the entire Air Force logistics community.

The AFLMA information system is a networked system providing office automation tools to the administrative, investigative, analytical, and technical support personnel in carrying out their mission-related functions. Administrative support is facilitated through the use of commercial off-the-shelf applications such as Microsoft Office Professional Suite. These applications provide access to databases and other information resources located on AFLMA information system network servers. The AFLMA information system network embodies an open architecture designed to accommodate the rapid introduction of advanced information processing resources. Complete

interconnectivity of the local area network comprises the single domain of the AFLMA information system network operating environment. Users access the system through individual Pentium desktop workstations installed throughout AFLMA.

In 2003, AFLMA was physically relocated to Maxwell AFB proper. This relocation presented significant challenges for our information technology personnel. Our servers are now located in a different building, so remote management activities have increased dramatically. We were able to configure our domain so that all steps required to access data are transparent to our users. Because of the technical expertise of our personnel, the entire information technology effort for the relocation was a turnkey operation.

After extensive research and comparative analyses, we invested in the latest technology refresh of data backup systems. This new system increased our storage capacity by 700 percent, allowing us to retain copies of 100 percent of our critical data.

After approximately 10 months of effort, we finished a complete inventory of all software used and maintained by AFLMA, and we destroyed many outdated software programs. At the same time, we performed an entire inventory of all software installed on more than 100 computer systems. We created a software inventory baseline and generated many reports to provide significant improvements in software configuration management. Additionally, we created means by which to deploy software and updates from a centralized location. This eliminated the need to manually install software on each machine.

Keeping the Saw Sharp

The Analysis Division constantly strives to enhance all work done at ALFMA. The development and implementation of a new and more rigorous review process of all AFLMA products has gained the appreciation and overwhelming support from the project managers. The analysts conduct regular training meetings to update each other on new techniques and experience gained from projects. The OR Branch often introduces problems and examples designed to stretch analytical *muscles* in directions that have not been worked in a while. The Analysis Division enhances functional projects through the careful and complex process of selecting and pursuing not just a technique that will work but the ones that will provide our customers the greatest insight and best recommendations. The division also strives to enhance analytical awareness of the project managers. The division provides a monthly presentation on OR tools to keep the program managers abreast of what is available to them. Effective and efficient utilization of analysts' resources often is possible only if the person leading a project is aware of the tools available. Our greatest strength is our robust application of analytic knowledge, coupled with experience and the analytical diversity we bring to any project.

This experience and diversity often are enhanced by our participation in major national and international conferences and workshops. AFLMA analysts have presented at the Military Operations Research Society symposiums, Air Force Operations Research Symposium, and Institute for Operations Research, and the Management Sciences Symposium. While this participation nets great gains for our analysts, it also serves to highlight the great work done by AFLMA to a larger and more varied audience and allows us to share our experiences with the broader military analytical community.

AFLMA Analysis Model Suite

JFAST - Joint Flow and Analysis System for Transportation. Used to determine transportation feasibility of time-phased force deployment data (TPFDD). It also can be used to build and resequence TPFDDs rapidly.

RBL - Readiness-Based Leveling. Used to develop and establish supply system, recoverable parts levels.

SIM-FORCE - Scalable Integration Model for Objective Resource Capability Evaluations. Used to measure the capability of a base to generate sorties using available resources (for example, equipment and personnel).

SIMUL8. General-purpose model that allows an analyst to construct tailored, process-simulation models.

GAMS - Generalized Algebraic Modeling System. A model that employs a general-purpose, mathematical programming language. It allows an analyst to construct tailored mathematical, process-optimization models.

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AFLMA Facts

Articles Published

"Managing Air Force Depot Consumables: The Big Picture," Kevin Gaudette, Douglas Blazer, and H. Kenneth Alcorn, *Air Force Journal of Logistics,* Vol XXVI, No 4.

"Reparability Forecast Model," H. Kenneth Alcorn, Kevin Gaudette, and Matthew Mangan, *Air Force Journal of Logistics,* Vol XXVI, No 4.

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at a Glance

Quick summary of AFLMA activities and results

AFLMA Results *Improvement, Requirements Team, and Consulting*

2003 Completed Projects

65 total projects

- 33 Improvement Studies
- 29 Consulting Studies
- 2 Requirements Team Studies
- 1 Canceled Study

Contracting

- 4 Improvement Studies
- 3 Consulting Studies
- 1 Canceled Study

Maintenance

- 6 Improvement Studies
- 5 Consulting Studies

Supply

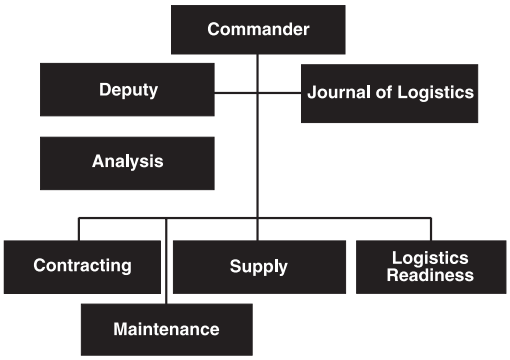
- 16 Improvement Studies
- 9 Consulting Studies
- 2 Requirements Team Studies

Logistics Readiness

- 7 Improvement Studies
- 12 Consulting Studies

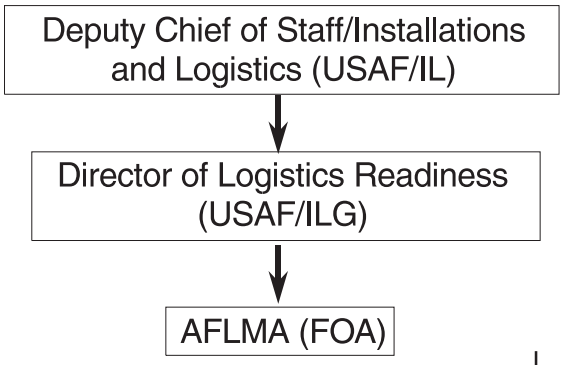
Organizational Structure

Organizationally, the Agency has four product divisions (Contracting, Maintenance, Supply, and Logistics Readiness) and two support divisions (Analysis and the Office of the Air Force Journal of Logistics). While the Agency is functionally organized, a multidiscipinary approach is used for all research, analysis, and project activity.



Command Relationships

The Air Force Logistics Management Agency is a field operating activity reporting to the Director of Logistics Readiness, Headquarters, United States Air Force.



2003 Completed Efforts

Books and Monographs

Logistics and Warfighting: Thinking About Agile Combat Support

Logistics Dimensions 2003

Combat Support: Shaping Air Force Logistics for the 21st Century

Reference

Contingency Contracting: A Handbook for the Air Force CCO

Vehicle Maintenance Safety: A Guide for the Air Force Vehicle Maintainer

Cumulative Index: Air Force Journal of Logistics

A Manual for Style: Air Force Journal of Logistics

Magazine

Air Force Journal of Logistics

Other

AFLMA: 2002 in Review

Agency folder and cut sheets

Wargames support material

Conferences/Major Meetings Attended

General

- Society of Logistics Engineers 37th Annual International Symposium
- 2003 Air Force Operations Research Society Conference
- Logistics Officers Association Conference
- Air Force Logistics Management Agency Program Review
- National Defense Industrial Association Convention
- Air Force Information Technology Conference

Logistics Readiness

- Annual Worldwide Transportation Conference
- Mini-Worldwide Deployment Conference, Workshop, and Functional Requirements Board
- PACAF Transportation Commander's Conference
- AMC Air and Ground Transportation Commander's Conference
- Vehicle Improvement Working Group and Vehicle Management Advisory Group
- Air Force Logistics Readiness Conference
- National Defense Transportation Association Forum
- USBank (PowerTrack) Symposium
- Information Systems and Technology Workshop
- Air Deployment and ITV Conference
- Worldwide Deployment Conference
- Federal Budgeting seminar
- Focused Logistics Wargame joint meetings
- Air Force War Reserve Materiel IPT
- Air Force War Reserve Executive Review Board
- Logistics Readiness Conference
- Global Engagement VI Planning Conference
- Air Expeditionary Wing Analysis System meetings
- Logistics Executive Crosstalk meetings
- Mini-Worldwide Deployment Conference
- Global Mobility Planning Conference
- Focused Logistics Wargame scenario deployment meetings
- Air Force Logistics Plans Crosstalk Conference
- Focused Logistics Wargame Modeling and Simulation Conference

Maintenance

- Air Force Maintenance and Munitions Advisory Group Conference
- Maintenance Information Systems Conference
- Worldwide F-16 Avionics Conference
- Air Force Maintenance Chiefs Advisory Group Conference
- Air Force Maintenance Reengineering Conference
- USAFE Munitions Conference
- ACC Munitions Conference
- Global Asset Positioning Conference
- Air Force Munitions Allocation Conference
- Air Force Munitions Working Group

Supply

- Air Force Materiel Management Board
- Spares Requirements Review Board
- Fuels Management Steering Group Conference
- Defense Energy Support Center Conference
- Air Force Fuels Strategic Planning Conference
- Air Force Stockage Policy Working Group meetings
- Air Force Supply Wartime Policy Working Group meetings
- Air Force Communications and Electronics Supply Work Group meetings
- Air Force Equipment Management Working Group meetings

Contracting

- 2003 Worldwide Contracting Conference
- HQ AFMC/PK Pricing Conference
- NAVSEA Contractor Performance Assessment Reporting System Conference
- SAF/AQC Pricing Symposium

Analysis

- Military Operations Research Symposium
- Air Force Analysis Community Steering Group
- Data and Model Management Steering Group
- Air Force Operations Research Symposium
- Air Force Modeling and Simulation Resource Repository Conference

Conferences and Meetings Hosted

General

- Air Force Logistics Management Agency Program Review
- Mission Support Group Commanders training
- Maintenance Group Commanders training
- Numerous senior logistics leaders visits

Supply

- Air Force Spares Campaign meetings

Logistics Readiness

- Global Strike Task Force Mobility meetings
- Beddown Feasibility meetings

Analysis

- Logistics Models and Simulation meetings

Manpower and Personnel

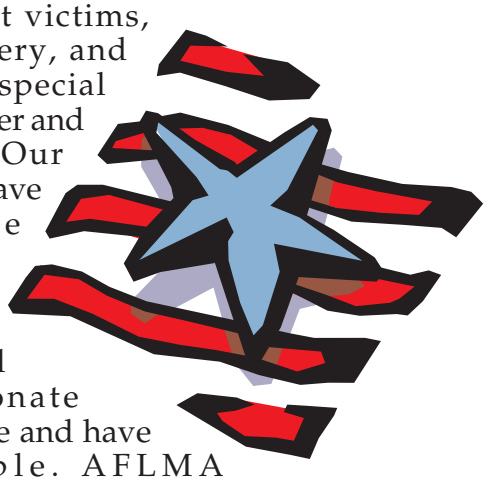
Manpower for the Agency will begin to decline this year as Air Staff-mandated cuts become effective. A total of nine authorizations will be lost over the next 5 years. These cuts are in addition to the nearly 50 authorizations lost during the three previously mandated reduction cycles.

Current authorizations are shown in the table that follows.

Authorized Manpower	
Support/Special	9
Analysis/Scientific/Computer	16
Contracting	5
Maintenance	9
Supply	12
Transportation	5
Logistics Plans	5
Total	61

Answering the Call:
Supporting the American Red Cross

AFLMA has, for many years, supported the efforts of the Red Cross in collecting blood for use in saving the lives of troops wounded in combat, accident victims, patients in surgery, and those receiving special treatment for cancer and other diseases. Our commanders all have recognized the importance of this effort and have strongly encouraged members to donate whenever possible and have led by example. AFLMA participation in base drives has reached as high as 20 percent, while nationwide, only about 5 percent of the eligible population donates.



AFLMA has a designated point of contact for base blood drives, who works directly with the Red Cross and the base coordinator, to ensure our people, as well as those in nearby units, are aware of the need for donors and the times and locations of upcoming drives. There are usually four to five Gunter community drives per year, and this involves distributing posters around the base and within the building, contacting potential donors to encourage them to give blood, and helping with coordinating and setting up the drive itself when the Red Cross visits our building.

Currently, both our local area—Montgomery, Alabama—and the entire country, are facing a severe shortage of blood for use in life-saving situations. This is due to many factors, including increased restrictions on who can donate (because of concerns like Mad Cow disease), the inconvenience of taking time to donate, a fear of needles, and simple apathy. In such times, the spirit of giving, that is always evident in the people of AFLMA, shines brightly as we extend our arms to help meet this special need.

Habitat for Humanity

The Agency has long been recognized for its logistical expertise and significant contributions to the Air Force logistics community. This year, we were blessed with an opportunity to apply our *expertise* to a different community, the local community. Members of AFLMA volunteered with the Autauga County Habitat for Humanity (HFH) to build a home for one less fortunate resident and her three children.

During this build, *LMAers* did everything from heavy construction (sheathing and roof decking) to finish work, such as painting and caulking. We hung storm doors, installed bathroom vanities, fit baseboards, and laid tile. If it had to be done and we knew how to do it, we did it. We also learned valuable lessons like *measure twice, cut once*, *read the directions…they're printed for a reason*, and *turn your clothes inside out when you paint so you don't ruin your favorite sweats*.

Although we learned a lot and had fun doing it, nothing will beat the feeling of watching the homeowner unlock the door and step across the threshold of a brand-new house. We can all take pride in knowing that we made a small difference in a neighbor's life.

News Notes

Current information about the Agency, its people, and its mission

AFLMA Support *Combined Federal Campaign*

Open Your

"The CFC guy's coming…quick act like you're busy!"

AFLMA experienced another successful year in raising money for the 2003 Heart of Alabama Combined Federal Campaign (CFC). During a 6-week campaign, lasting from 22 September to 7 November 2003, the generosity of AFLMA members resulted in an *Early Bird* award and total contributions amounting to 139 percent of the assigned goal. AFLMA's success contributed to an exceptional year for the Heart of Alabama campaign, in which a record $880,535 was collected on behalf of organizations from across the nation.

The Early Bird award is given to organizations that reach or exceed their goal within the first 15 workdays of the campaign (that is by 10 October). AFLMA, through the cooperation and enthusiasm of contributors, eclipsed its goal by the 10th day of the campaign. The end of the campaign resulted in an impressive 77-percent contribution rate from AFLMA personnel.

Meals on Wheels

The Montgomery Area Council on Aging is a nonprofit organization that works through the Meals on Wheels Association of America (MOWAA) to provide warm meals to elderly people in need. However, MOWAA thrives only through its network of hard-working volunteers. More than half the people at the AFLMA take time out during the week to help deliver these warm meals to elderly folks in need. Volunteers provide a friendly smile; a chance to communicate with community members; and most important, a nutritious meal to get them through the day. The AFLMA volunteers work hard but find the program rewarding. Delivering meals gives volunteers a chance to get away from their desks and reach out to a community in need.

2003 Annual Awards

The AFLMA annual awards recognize outstanding job performance, community involvement, and civic service. The criteria for selection are demanding, and the evaluation process rigorous. The AFLMA norm is excellence, and to be selected signifies the individual was a *cut above* his or her contemporaries.

Civilian of the Year GS12-15

Mr John K. Dietz, Analysis Division

Civilian of the Year GS7-11

Ms Anne H. Gluth, Executive Support

Company Grade Officer of the Year

Capt Daniel P. Johnstone, Supply Division

Senior NCO of the Year

SMSgt Robert A. McGonagle , Supply Division

NCO of the Year

TSgt Ricky D. Benton, Supply Division

People's Quality Award

Quarter 1

No Photo Available

MSgt James Roloff

Quarter 2

Capt Robert E. Overstreet

Quarter 3

1Lt Kristopher A. Pruitt

Quarter 3

1Lt Rachel L. Oats

The People's Quality Award is given on a quarterly basis to the individual who has made a major contribution to supporting or improving AFLMA efforts, projects, or the people of the Agency. Anyone within the Agency can submit a nomination for this award. A randomly selected committee evaluates the nominations and chooses the recipient. No winner was selected for the fourth quarter.

2003 Quarterly Awards

To be selected as an AFLMA quarterly award winner is a particularly significant accomplishment. The recipient must have demonstrated outstanding job performance and meaningful community involvement or service. As with the annual award, the criteria are demanding and the selection process rigorous.

First Quarter

Ms Gale J. Bowman
Analysis Division
Civilian GS12-15

Capt Timothy A. Smith
Maintenance Division
Company Grade Officer

SMSgt Woodrow A. Parrish
Supply Division
Senior NCO

Second Quarter

Mr James C. Rainey
Journal of Logistics
Civilian GS12-15

Mr Bernard N. Smith
Analysis Division
Civilian GS7-11

Capt Robert E. Overstreet
Logistics Readiness Division
Company Grade Officer

SMSgt Robert A. McGonagle
Supply Division
Senior NCO

Third Quarter

Ms Mary H. Donald
Analysis Division
Civilian GS12-15

Ms Celestine Jones
Executive Support Staff
Civilian GS7-11

Capt Jason L. Masciulli
Logistics Readiness Division
Company Grade Officer

MSgt Daniel J. Bender
Logistics Readiness Division
Senior NCO

Fourth Quarter

Mr Sherman S. Cockrell
Analysis Division
GS12-15

Mr Bernard N. Smith
Analysis Division
Civilian GS7-11

Capt Stephen D. Wier
Supply Division
Company Grade Officer

MSgt James C. Jones II
Executive Support
Senior NCO

TSgt Ricky D. Benton
Supply Division
NCO

Journal Quick Reference

Facts at a Glance

- **Printed quarterly—14,000 copies**
- **Distributed worldwide**
- **Logistics research focus—premier Air Force logistics research publication**
- **Refereed publication**
- **Known and respected Editorial Advisory Board—22 members**

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Submit a Manuscript

Manuscripts from any source—civilian or military—are always welcome. Articles or essays should be from 1,500 to 5,500 words. We also welcome manuscripts for books, monographs, or similar publications.

All manuscripts should be sent to us via e-mail to the following address:

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Manuscripts also can be submitted in hard copy if e-mail is not available. They should be sent to the following address:

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All manuscripts must be in Microsoft Word or WordPerfect format, and all supporting tables, figures, graphs, or graphics must be provided in separate files (preferably created in Microsoft Office products). They should not be embedded in the manuscript.

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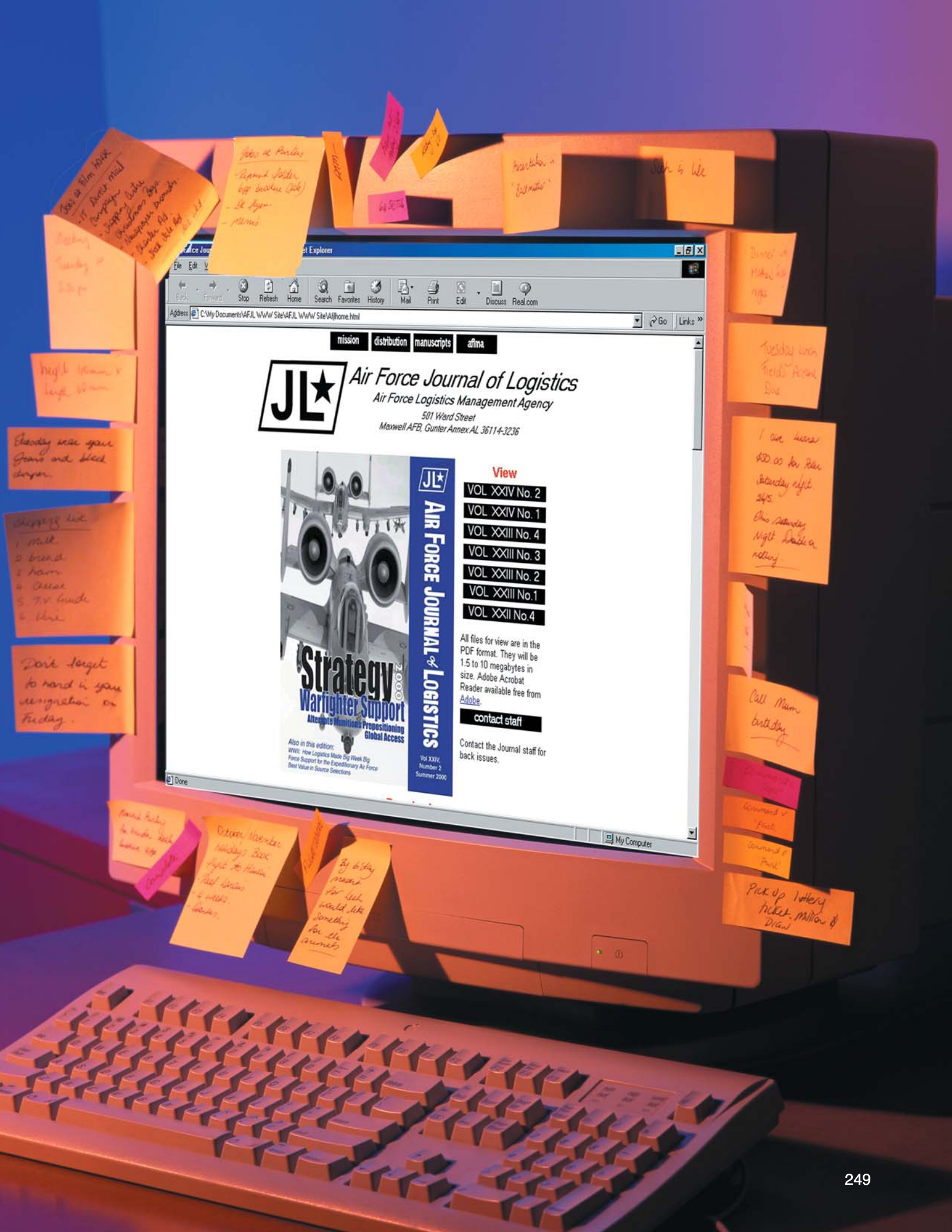
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Enough about us. Let's talk about you.

In today's slimmed-down military, we all do more with less…and the military landscape keeps changing around you…many times faster than, perhaps, you'd like.

You need a partner to help solve your problems and deal with that changing landscape. That's where we come in.

Our mission is to increase Air Force readiness and combat capability by enhancing logistics efficiency and effectiveness.

Let us put our team of experts to work for you.

Since its inception, the Air Force Logistics Management Agency has grown to be recognized for its excellence—excellence in providing answers to the toughest logistics problems. And that's our focus today—tackling and solving the toughest logistics problems and questions facing the Air Force. It's also our focus for the future.

Our key strength is our people. They're all handpicked professionals from logistics functions, operational analysis sections, and computer-programming shops. They have the kind of experience that lets us blend innovation and new technology with real-world common sense and moxie. It's also the kind of training and experience you won't find with our competitors. Our special blend of problem-solving capabilities is available to every logistician in the Air Force.

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