Audit Report

OFFICE OF THE INSPECTOR GENERAL

ACQUISITION-TYPE LESSONS-LEARNED PROGRAMS WITHIN THE MILITARY DEPARTMENTS

Report No. 93-173 September 27, 1993

Department of Defense

Acronyms

AFLC	Air Force Logistics Command
AFSC	Air Force Systems Command
AMRAAM	Advanced Medium Range Air-to-Air Missile
CAC	Combined Arms Center
CIWS	Close-In Weapon System (Phalanx)
DLSIE	Defense Logistics Studies Information Exchange
ILS	Integrated Logistics Support
JLC	Joint Logistics Commanders
MCS	Maneuver Control System
MILDEPS	Military Departments
MOA	Memorandum of Agreement
MRSA	Materiel Readiness Support Activity
NALL	Naval Aviation Lessons Learned
NAVAIR	Naval Air Systems Command
PEO	Program Executive Officer
SRB	Specification Review Board

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
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September 27, 1993

MEMORANDUM FOR ASSISTANT SECRETARY OF THE NAVY (FINANCIAL MANAGEMENT)
ASSISTANT SECRETARY OF THE AIR FORCE (FINANCIAL MANAGEMENT AND COMPTROLLER)
INSPECTOR GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Audit Report on Acquisition-Type Lessons-Learned Programs Within the Military Departments (Report No. 93-173)

We are providing this report for your information and use. The report discusses the use of lessons-learned information during the development and modification of major weapon systems. The report also discusses the attempt to establish an integrated lessons-learned exchange program within the Military Departments. Comments on the draft of this report were required by August 24, 1993; however, comments were not received from the Joint Logistics Commanders. DoD Directive 7650.3 requires that all audit recommendations be resolved promptly. Therefore, we request that the Joint Logistics Commanders provide comments on the findings and recommendations by November 29, 1993. Also, Army and Navy comments are not fully responsive to the recommendations. We request, therefore, that the Assistant Secretary of the Army (Research, Development and Acquisition) and the Assistant Secretary of the Navy (Research, Development and Acquisition) provide comments on the unresolved portions of the recommendations by November 29, 1993.

Recommendations are subject to resolution in accordance with DoD Directive 7650.3 in the event of nonconcurence or failure to comment. We ask that your comments also indicate concurrence or nonconcurrence with the internal control weaknesses highlighted in Part I. The report identifies no quantifiable monetary benefits; Appendix B summarizes potential benefits of the audit.

We appreciate the courtesies extended to our audit staff. If you have questions on this audit, please contact Mr. James Koloshey, Program Director, at (703) 614-6225 (DSN 224-6225) or Mr. Eddie Ward, Project Manager, at (703) 614-6222 (DSN) 224-6222). Appendix D lists the distribution of this report.

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Audit Report 93-173
(Project No. 2AG-5007)

September 27, 1993

ACQUISITION-TYPE LESSONS-LEARNED PROGRAMS WITHIN THE MILITARY DEPARTMENTS

EXECUTIVE SUMMARY

Introduction. Lessons-learned data are recorded experiences of value to the conduct of current and future acquisition programs. They are conclusions drawn from analysis of feedback on deployed systems or systems currently under development and modification. The use of lessons-learned data should assist program offices in the acquisition process by avoiding the repetition of mistakes or profiting from examples of positive results.

Objectives. The audit objectives were to determine whether weapon system supportability problems were accurately reported by operational commands and whether lessons-learned data were adequately considered by acquisition officials during weapon system development and modification. To accomplish both objectives, we evaluated policies and procedures used by program offices for identifying and using lessons-learned data.

Audit Results. This report contains two findings related to the Military Departments' use of lessons-learned data during the acquisition process.

- The Military Departments did not fully use or exchange formalized lessons-learned data during the development or upgrade of major weapon systems (Finding A).

- An attempt to establish a lessons-learned exchange program among the Military Departments has not progressed much since program inception in 1989 (Finding B).

Consequently, acquisition officials have not realized the benefits of these historical data to avoid mistakes or profit from positive results.

Internal Controls. The audit identified internal control weaknesses as defined by Public Law 97-255, Office of Management and Budget Circular A-123, and DoD Directive 5010.38. They are highlighted in Part I. Policies and procedures were not adequate to ensure that acquisition officials used the Military Departments' formalized lessons-learned data. (Finding A).

Potential Benefits of Audit. The primary benefits that will be realized from implementing the audit recommendations are unquantifiable cost avoidance through better system design and reduced system life-cycle costs. These potential benefits are summarized in Appendix B. We are not able to quantify the savings related to cost avoidance since future use of weapon systems could not be projected.

Summary of Recommendations. We recommended that the Assistant Secretary of the Army (Research, Development and Acquisition) and the Assistant Secretary of the Navy (Research, Development and Acquisition) strengthen existing lessons-learned policies to ensure program offices use these data during their decisionmaking. We

recommended that the Army Deputy Chief of Staff for Logistics establish a computerized data base that includes acquisition and logistics lessons-learned data. Also, we recommended that the Commander, Air Force Materiel Command, enforce existing policies to require the use and dissemination of lessons-learned data by acquisition offices. Finally, we recommended that the Joint Logistics Commanders designate an executive agency that will be responsible for program oversight and for establishment of more specific program guidelines.

Management Comments. The Army agreed with the recommendations addressed to them, but did not explicitly address actions to require program offices to use formalized lessons-learned data during development. The Navy partially concurred, stating that policy requiring the use of lessons-learned data should be set by DoD. Navy will advise program managers of the availability of data from existing reporting systems, but these are not lessons-learned data bases. The Air Force concurred with the recommendation addressed to them. Joint Logistics Commanders' comments were not received within the specified time, but the Army, which is the lead Military Department in this instance, will coordinate a response to the final report. We request the responses by November 29, 1993.

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The Acquisition Management Directorate, Office of the Assistant Inspector General for Auditing, DoD, prepared this report. Copies of the report can be obtained from the Secondary Reports Distribution Unit, Audit Planning and Technical Support Directorate, (703) 614-6303 (DSN 224-6303).

Part I - Introduction

Background

Program officials responsible for major weapon system development or upgrade should deploy systems that are supportable and sustainable. The identification and utilization of lessons-learned data during the acquisition process can contribute to reduced weapon system life-cycle costs while also achieving readiness requirements.

DoD Instruction 5000.2, "Defense Acquisition Management Policies and Procedures," February 23, 1991, does not specifically require the use of lessons-learned data by acquisition officials. However, Part 6, Section C of the Instruction does emphasize that reliable and maintainable systems can be achieved through a disciplined engineering approach that employs the best design and manufacturing practices. Emphasis should be on preventing design deficiencies, precluding the selection of unsuitable parts and materials, and minimizing the effects of variability in the manufacturing processes. Acquisition officials can achieve such goals by using lessons-learned data in their decisionmaking to avoid repeating mistakes and profit from positive experiences.

Objectives

Our audit objectives were to determine whether weapon system supportability problems are accurately identified and reported by operational commands and whether lessons-learned data were adequately considered by acquisition officials during weapon system development or modification. We also reviewed the applicable internal controls related to this process.

Scope

This performance audit was conducted from July 1992 through March 1993 in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD, and accordingly included such tests of internal controls as were deemed necessary. We evaluated the Military Departments' (MILDEPS) policies and procedures for reporting weapon system supportability problems. We also assessed the use of lessons-learned data by acquisition officials. We assessed seven major weapon system acquisition programs that were either in the developmental or modification phase of the acquisition cycle to determine whether program officials considered and used lessons-learned data during program

decisionmaking. The audit included a review of documents and reports dated from May 1981 through March 1993. The activities visited or contacted during the audit are listed in Appendix C.

Internal Controls

In evaluating internal controls, we reviewed policies and procedures used by the Military Departments for using and disseminating lessons-learned data. The audit disclosed internal control weaknesses as defined by Public Law 97-255, Office of Management and Budget Circular A-123, and DoD Directive 5010.38. The Military Departments lessons-learned data bases were not sufficiently reliable to allow acquisition officials to use these data during weapon system development and modification. Implementation of Recommendations A.1., A.3., and A.4. will correct the weaknesses and provide assurance that lessons-learned data will be utilized and result in lower weapon system life-cycle costs. We were not able to quantify the savings related to cost avoidance since future use of weapon systems could not be projected. Senior officials responsible for internal controls in the areas identified will be provided a copy this report.

Prior Audits and Other Reviews

The Department of Defense, Office of the Inspector General; Service Audit Agencies; and the General Accounting Office have not specifically assessed the reporting or utilization of supportability-related lessons-learned data within the last 5 years.

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Part II - Findings and Recommendations

Finding A. Using Lessons-Learned Data

Program offices responsible for acquiring major weapon systems were not adequately evaluating and disseminating lessons-learned data during weapon systems development and modification. The Army and Navy had not implemented adequate policies for identifying, analyzing, and disseminating lessons-learned data. The Air Force had adequate policies in place; however, program offices were not adhering to these policies. On a DoD-wide basis, there was insufficient awareness in the acquisition community of the benefits of using lessons-learned data. Consequently, acquisition officials usually did not benefit by avoiding past mistakes or profiting from positive results derived from data collected from the extensive reporting systems of the Military Departments.

Background

Lessons-learned data are recorded experiences of value to the conduct of current and future acquisition programs. They are conclusions drawn from analysis of feedback on deployed systems or systems currently under development or modification. Lessons learned may be positive or negative. Positive lessons show successes or innovative techniques, while negative lessons show deficiencies or problems to be avoided. There are two categories of acquisition lessons learned: technical and management.

Technical. These lessons are related to systems, equipment, and components, including hardware, software, support equipment, or design factors that influence the performance of weapon systems. Most lessons learned are technical in nature. An example of a technical lesson learned is a documented incident that involved a missile component that malfunctioned and caused the missile's rocket motor to ignite. The lesson-learned data showed that when certain internal components of a missile system were subjected to intense vibration, the components became loose and caused missile malfunctions. A detailed discussion of this lesson learned is in Appendix A.

Management. These lessons address program decisions and actions in areas such as budgeting, contracting, acquisition planning, and data management. An example of a management lesson learned is related to a joint Air Force and Navy acquisition program that involved termination of an internal specification review board (SRB). The board had been responsible for reviewing system specification documents. Subsequently, inconsistencies among the specification documents developed for which the Government could not hold the contractor responsible. The lesson learned from this incident was that using SRBs for a joint acquisition program will minimize inconsistencies in contractor specification documents. A detailed discussion of this lesson learned is in Appendix A.

Assessing Lessons-Learned Programs - Army

We evaluated acquisition programs for three major weapon systems and found that lessons-learned data bases were not systematically used in program decisionmaking. The three acquisition programs assessed were M2/M3 Bradley Fighting Vehicle, M1 Abrams Tank, and Advanced Anti-Tank Weapon System - Medium (Javelin).

Bradley and Abrams Programs. Acquisition officials relied on contractors' analyses and the corporate knowledge of their program office staff, such as engineers and logisticians, for lessons-learned data. Both offices also required their respective contractors to acquire, document, and store lessons-learned in data bases that were maintained by the contractors; however, these data were not available for sharing with other Army programs or the other Military Departments. Furthermore, these data are not transferable to the Army's centralized lessons-learned data base.

Javelin Program. The program office did not use lessons-learned data from or provide input to the Army's lessons-learned data base except for two lesson-learned reports submitted by the program office in 1990 and 1992. These officials relied on their prime contractors and the corporate knowledge of program office staff for lessons-learned information.

Policies. The Army Chief of Staff in 1985 directed the establishment of a formal system for capturing, analyzing, and disseminating lessons-learned information. Several regulations resulted from this decision; however, these regulations did not provide adequate guidance for all aspects of acquisition lessons-learned programs. The one policy that did apply to acquisition lessons-learned data had been rescinded.

o Army Regulation 11-33, "Army Lessons Learned Program: System Development and Application," October 10, 1989, established the Army's comprehensive lessons-learned system. However, this regulation focused primarily on tactical-type lessons learned.

o Army Regulation 700-127, "Integrated Logistics Support," July 17, 1990, requires acquisition officials to provide input on initial support problems, support innovations, and other issues to the Army's Integrated Logistics Support (ILS) lessons-learned information file. This regulation focuses primarily on logistics-type lessons-learned data. It does not fully address acquisition-type lessons-learned such as latent design defects.

o Army Materiel Command Regulation 11-44, "Army Materiel Command Lessons Learned Program," December 15, 1989, (Rescinded) established guidance for acquisition officials to collect operational, technical, and managerial experiences that would be helpful to decisionmakers and disseminate these lessons learned to other Army activities. This regulation provided adequate guidance for acquisition officials to use lessons-learned data during their decisionmaking process; however, it was rescinded in October 1992.

Lessons-Learned Data Base. Responsibilities for maintaining the Army's lessons-learned data base were delegated to the Army's Materiel Readiness Support Activity (MRSA). Data were collected by MRSA on major training exercises, combat operations, and integrated logistics support issues. Data related to tactical-type issues were computerized; however, data related to acquisition and logistics issues were maintained only in hard copy. Consequently, these data were not readily accessable to program officials.

Assessing Lessons-Learned Programs - Navy

Two acquisition programs were assessed: F/A-18 Hornet Aircraft, managed by the Program Executive Officer (PEO) for Tactical Aircraft Programs, and the Close-In Weapon System (Phalanx) (CIWS), managed by the Program Executive Officer for Ship Defense.

F/A-18. Although the Naval Air Systems Command has had a centralized lessons-learned data base since 1983, there was no evidence that F/A-18 program officials used the data base in their decisionmaking process. These officials used internal sources they believed were more reliable and timely than the centralized data base. Specifically, they relied on the program office staff's corporate knowledge of specific weapon system problems and deficiencies and analyses compiled by prime contractors.

Close-In Weapon System (Phalanx). Neither the Naval Sea Systems Command nor the program office had a requirement for acquisition officials to use lessons-learned data in their decisionmaking process. The program office relied on the contractor's knowledge and program office's analyses of fleet reporting on equipment failures and deficiencies.

Policies. There was no Navy-wide policy requiring acquisition officials to use lessons-learned data in their decisionmaking. Furthermore, there were no requirements within either the PEO or program management organization to use lessons-learned data. However, the Naval Air Systems Command (NAVAIR) was drafting an instruction titled "Naval Aviation Lessons Learned (NALL) Program," which establishes policies and procedures and assigns responsibilities for operating the NAVAIR lessons-learned program. The proposed instruction would require all NAVAIR entities to use and participate in the NALL program.

Lessons-Learned Data Base. The NALL program was established in 1983 to support the Joint Services Advanced Vertical Lift Aircraft acquisition program as a formalized process for obtaining lessons-learned data from sources such as engineering investigations, inspection survey reports, test reports, engineering

change proposals, and maintenance and fleet reporting. However, the use of this data base by acquisition officials was optional since no overall Navy, NAVAIR, or PEO policies required its use.

Assessing Lessons-Learned Programs - Air Force

Two acquisition programs were assessed: F-16 Falcon Aircraft, managed by the Program Executive Officer for Tactical and Airlift Programs and the Advanced Medium Range Air-to-Air Missile (AMRAAM), managed by the Program Executive Officer for Conventional Strikes. The F-16 is a fielded system undergoing program modifications. The AMRAAM is a developmental program in acquisition phase III with a Pre-planned Product Improvement Program in process. Acquisition officials for the two programs did not use the Air Force's formalized lessons-learned data base in their decisionmaking process. Program officials relied on corporate knowledge gained from their contractors and program office staff for lessons-learned data.

Policies. The Air Force had formalized policies in place requiring acquisition officials to use lessons-learned data in their decisionmaking process. Specifically, Air Force Logistics Command (AFLC) and Air Force Systems Command (AFSC) (now combined under Air Force Materiel Command) Regulation 800-37, "Joint AFLC/AFSC Lessons Learned Program," April 15, 1988, requires program offices responsible for planning and acquiring weapon systems to identify, assess, document, and disseminate lessons-learned data throughout a system's life cycle. The guidance also requires program offices to make maximum use of lessons learned from other sources to avoid repeating mistakes. However, the Air Force's lessons-learned policy was not adhered to by the two program offices.

Lessons-Learned Data Base. The Air Force's lessons-learned data base was implemented in 1977 and was fully automated in 1978. The data base basically contains management and technical-type lessons-learned information. The data base also serves the other two MILDEPS. Although formalized procedures exist for using the data base, use of the data base by acquisition officials was almost nonexistent because of limited feedback from the acquisition community. As a result, participation in the Air Force's lessons-learned program by the two acquisition programs reviewed was limited.

Consequences and Benefits

The failure of acquisition officials to develop effective procedures or adhere to established policies for using lessons-learned data during the acquisition process resulted in missed opportunities for acquisition programs to avoid repeating mistakes or gain by incorporating successful results. We found several examples that show the consequences of program offices not participating in an exchange of lessons-learned information. We also show an example of benefits gained from lessons-learned information.

Consequences. To prevent a slippage in the AMRAAM's initial fielding schedule, acquisition officials decided to begin low-rate initial production with only a preliminary missile design. At that time, the missile design was not fully capable against more sophisticated enemy electronic countermeasures. Realizing this limitation, acquisition officials pursued and obtained approval to proceed with low-rate initial production. These officials ignored experience that shows moving an acquisition program prematurely into the production phase with a limited system design can result in significant problems.

Currently, the AMRAAM program, which is a joint Air Force and Navy developmental effort, is confronted with a possible slip in the Navy's initial operating capability date by as much as a year to allow the Navy to implement and complete an engineering change program for resolving interface deficiencies between the aircraft and the missile.

Lessons Exchanged. This example involved the Army Maneuver Control System (MCS). Lessons-learned data that had been analyzed and compiled by the Army's Combined Arms Center (CAC) were not shared with potential users. Although these data, which had been compiled from the Operations Desert Shield and Desert Storm, represented valuable information to acquisition officials, CAC did not disseminate this report to the MCS program office. Therefore, specific deficiencies in training and use of the MCS system were not available to the program office.

Benefits Realized. When properly used, lessons-learned data can provide valuable opportunities for acquisition officials to avoid repeating costly mistakes. For example, lessons-learned data obtained from the Army's Javelin program have allowed other DoD acquisition programs to benefit from research efforts related to the Javelin's state-of-the-art development on seeker research.

In October 1992, the Under Secretary of Defense for Acquisition designated the Javelin as the lead acquisition program in the development of second generation imaging device, which is a component of the system's guidance section. The Javelin had encountered significant problems that resulted in major program cost increases and schedule slippage. Problems associated with the development of second generation imaging technology were related to the capability to produce enough quality devices. Since this device was to be common among other DoD programs, lessons-learned data from the Javelin research efforts were shared with the other Military Departments and should preclude them from encountering the same developmental problems with their imaging devices.

Lessons-Learned Committee. The Navy Antiair Warfare Weapon System Lessons-Learned Committee represented one of the most formalized processes used by Navy acquisition officials for capturing and using lessons-learned data. The committee was established in 1984 to identify problems and define solutions for certain classes of guided missile cruisers and destroyers as they entered the fleet. The committee used fleet reporting via the Navy's Maintenance and Material Management System, which documents equipment maintenance-related problems. This reporting is captured and analyzed by contractors for potential lessons learned. The results are provided to the Antiair Warfare Weapon System Lessons-Learned Committee for action.

Reporting Systems

The Military Departments used various methods, such as maintenance and material reporting systems, quality deficiency reporting, and engineering investigations to report supportability problems relative to equipment failures and deficiencies. Our review showed these reporting systems were collecting extensive information on various types of incidents. Although available to acquisition program offices to evaluate, the lessons-learned data were seldom used by anyone outside the logistics community. We believe the significant resources expended by the Military Departments to manage these reporting systems can be further enhanced if used by acquisition program offices. Other than the Antiair Warfare Weapon System Lessons-Learned Committee, as discussed above, we did not find program offices using these systems as a lessons-learned source.

Conclusion

Utilization of lessons-learned data in the decisionmaking process during the development or modification of weapon systems can result in reduced life-cycle costs and improved readiness. Examples show when lessons-learned data are shared among the Military Departments and used by acquisition officials, mistakes are not repeated. The Military Departments had some aspects of lessons-learned policies in place. However, except in the Air Force, the policies were generally inadequate and not sufficiently comprehensive to be effective.

Recommendations, Management Comments, and Audit Response

1. We recommend that the Assistant Secretary of the Army (Research, Development and Acquisition):

a. Modify existing policies to require the inclusion of acquisition-type lessons-learned data in the Army data base maintained by the Materiel Readiness Support Activity.

Army Response. The Office of the Assistant Secretary of the Army (Research, Development and Acquisition) agreed with the recommendation and stated that the Army would provide an acquisition lessons-learned data base to be maintained by the Materiel Readiness Support Activity. Guidance would be published in the fourth quarter of FY 1994. The full text of Army's comments is in Part IV of this report.

Audit Response. We consider the Army's comments to be responsive and no further comments are required for Recommendation 1.a.

b. Require program offices to use the Army's formalized lessons-learned data during the development or modification of major weapon systems.

Army Response. Management agreed with the recommendation and stated that the Army is broadening the scope of data collection. Technical data will be maintained by the Army Materiel Command but will be processed through and shared by the Center for Army Lessons-Learned.

Audit Response. Although management's response is positive, it does not specifically address the issue of requiring program offices to use lessons-learned data. When gathered, analyzed, and applied, lessons learned can reduce program risk. We request the Army provide a firmer commitment to use lessons learned once the data base has been established.

2. We recommend that the Army Deputy Chief of Staff for Logistics automate the Army's lessons-learned data into an easy-to-retrieve data base.

Army Response. The Army is automating Integrated Logistics Support Lessons Learned into a simplified system so retrieval will be easier. The vehicle for this automation is the Logistics Planning and Requirements Simplification System. ILS Lessons Learned will be incorporated into the system's electronic bulletin board, and further automation will take place as priority or resources permit. The full text of Army's comments is in Part IV of this report.

Audit Response. We consider the Army's comments to be responsive and no further comments are required for Recommendation 2.

3. We recommend that the Assistant Secretary of the Navy (Research, Development and Acquisition) revise existing policies to require program offices to access lessons-learned data bases during weapon system development and modifications.

Navy Response. The Assistant Secretary of the Navy (Research, Development and Acquisition) partially concurred. The Navy stated that DoD Instruction 5000.2 specifically requires review of lessons-learned data for many functional areas, as discussed in Parts 6, 7, and 10. Management stated that DoD Directive 5000.1 can not be supplemented without approval by DoD or by statute and therefore recommended that "other 'lessons learned' areas" be considered by the Under Secretary of Defense (Acquisition) for later revisions to DoD Instruction 5000.2. Notwithstanding, Navy will advise program managers of the availability of operational data from Navy reporting systems such as the Maintenance and Material Management System. The full text of Navy comments is in Part IV.

Audit Response. The audit report discusses DoD Instruction 5000.2 with specific reference to lessons learned (see Background section). Management-cited references to the Instruction do not discuss lessons learned. Also, we are aware of the policy regarding supplementation to the Instruction. A memorandum advising program managers of the availability of operational data through Navy reporting systems such as the Maintenance and Material Management System will not meet the intent of the recommendation. However, operational lessons learned are not the subject of this audit; moreover, Chief of Naval Operation Instruction 3500.37, "Navy Lessons Learned System (NLLS)," March 17, 1992, already provides for the submission, validation, and distribution of maritime-specific lessons of an operational nature, which would provide more refined information than reporting systems such as Maintenance and Material Management. We believe that the Navy should issue policy specifically addressing acquisition lessons learned.

4. We recommend that the Commander, Air Force Materiel Command, require program offices to use and disseminate lessons-learned data during the development and modification of major weapon systems.

Air Force Response. The Assistant Secretary of the Air Force (Acquisition), and Deputy Assistant Secretary (Management Policy and Program Integration) concurred. Management stated that the Air Force was instituting specific processes for each major system acquisition area. According to the approved Air Force supplement to DoD Instruction 5000.2, all Air Force functional activities will provide appropriate lessons for the data base. Each program office will periodically review the appropriate lessons learned and apply the applicable best practices. The full text of the comments is in Part IV of this report.

Audit Response. We consider the Air Force comments to be responsive to the recommendation; no further comments are required.

Finding B. Joint-Service Lessons-Learned Program

The Joint Logistics Commanders' (JLC) attempt to establish an integrated lessons-learned exchange program among the Military Departments has languished since the program's inception in 1989. The JLC's Memorandum of Agreement (MOA), which authorized the program, was vague and limited primarily to logistics-type data, thus excluding acquisition-related lessons-learned data. In addition, the agreement assigned program implementation responsibilities to organizational entities that lacked authority to initiate significant program actions. As a result, the benefits that could be derived from such a program have not been realized.

Background

Memorandum of Agreement. On March 16, 1989, the JLC signed an MOA to establish a system for exchanging lessons-learned data among the Military Departments. The agreement between the Army Materiel Command, the Office of the Chief of Naval Operations, and the Air Force Logistics Command and the Air Force Systems Command (combined as the Air Force Materiel Command in July 1992), outlined the objectives regarding the exchange of logistics lessons-learned data. The MOA stipulated four specific objectives:

o Exchange lessons-learned and supporting data freely among all Military Departments.

o Provide for timely exchange of lessons-learned data while minimizing administration and coordination required to effect the exchange.

o Use a minimum standard format for documenting individual lessons-learned within and among the Military Departments.

o Retain independence of each Military Department's lessons-learned data base since each Military Department's lessons-learned data are essentially hardware-specific.

Ad Hoc Working Group. To fulfill the MOA objectives, an Ad Hoc working group was formed consisting of representatives from each Military Department. The MOA called for the Ad Hoc group to meet at least annually to manage the JLC program. The group has met annually since 1989 to discuss problems and other issues associated with the Military Departments' attempt to accomplish the MOA objectives. The group also considered alternative strategies.

Program Progress

Our analysis of program minutes and discussions with members of the Ad Hoc group disclosed that the program has made only minimal progress since its inception. Our review of the group's minutes disclosed that after almost 4 years of planning, the group is not close to fulfilling the MOA's objectives. Specifically, the minutes disclosed a lack of significant progress in establishing a mechanism for exchanging aviation lessons-learned data among the Military Departments. Although the Navy and Air Force have made some progress in formulating plans for exchanging aviation lessons-learned data, the Army has not demonstrated much progress or shown much interest in participating in the effort. The group had recognized earlier that the Army's lessons-learned data base, which was in hard copy only, was not compatible with the Navy and Air Force's computerized systems.

At the Ad Hoc group's annual meeting in 1990, the Army considered the possibility of using lessons-learned data stored at the Defense Logistics Studies Information Exchange (DLSIE) to establish compatibility with the Navy and Air Force. However, the issue was dropped after an Army internal reorganization resulted in DLSIE being transferred from the Army Materiel Command. There is no evidence that the Army considered any other alternative.

Agreement Language

Concerns have been raised within the Ad Hoc group over the MOA's language. For example, a briefing paper on the feasibility of integrating data bases stated that the language of the MOA was too general to effectively standardize the Military Departments' lessons-learned process. The paper concluded that each Military Department has a distinct set of procedures for the retrieval, validation, and maintenance of its respective data base, leading to a lack of standardization in procedures among the Military Departments.

Currently, the group is attempting to address the standardization issue. Also, one Military Department representative proposed that an executive agency be designated to establish direction and define specific milestones for completing group taskings.

Ad Hoc Group Representation

Since its inception, the Ad Hoc group has been comprised solely of logisticians from organizations within the Military Departments who did not have authority to implement significant program actions. In addition, there was no

representation from acquisition organizations. Furthermore, the minutes of the annual meetings did not reflect coordination by the logisticians with acquisition officials.

As shown in Finding A of this report, acquisition managers responsible for major weapon system development do not normally query their Military Departments' formal lessons-learned data bases before major program decisions. We believe that without active participation by the Military Departments' acquisition organizations in the JLC planning process, it is highly unlikely that acquisition officials will effectively use the exchange program in their decisionmaking.

Conclusion

Although nearly 4 years of planning have transpired since the JLC signed the MOA for establishing an integrated lessons-learned program, the Ad Hoc group has made little progress in developing an effective plan for its implementation. These 4 years have been marked by a lack of measurable progress and a lack of defined milestones for completing taskings.

Recommendations for Corrective Action and Management Response

We recommend that the Joint Logistics Commanders:

1. Designate an executive agency to be responsible for program oversight and require the inclusion of the acquisition community representation in the Ad Hoc group.

2. Require the executive agency to establish more specific guidelines for defining program taskings and milestone dates.

Joint Logistics Commanders Response. The JLC did not provide comments within the specified time. The official who is serving as the focal point for coordination of the JLC response indicated, however, that he would initiate action so we will receive a response to the final report.

Part III - Additional Information

Appendix A. Lessons-Learned Examples

Synopsized below are lessons-learned examples from the Military Departments' lesson-learned data bases, as discussed in Finding A of this report.

Technical Lesson-Learned Example

Problem: The metal end plug of an AMRAAM rocket motor igniter tube disengaged and became lodged in the fuel tank. The igniter produced localized heating during vibration testing that caused the rocket motor to ignite.

Discussion: During developmental vibration testing, the threaded end plug of the AMRAAM rocket motor igniter disengaged and fell into a radial slot in the fuel tank. Since the designs of the AMRAAM motor igniter and the fuel tank are representative of tactical missile rocket motor designs, this problem could be encountered during the design of future tactical rocket motors.

Lesson-Learned Data: Components internal to solid propellant rocket motors that are subject to intense vibration may become loose and fall out. This situation could cause the missile's rocket motor to ignite.

Management Lesson-Learned Example

Problem: The Joint Air Force and Navy acquisition program, AMRAAM, used an internal SRB for many years. Use of the SRB resulted in consistency in system specification documents that were produced by contractors. However, after SRBs were discontinued, inconsistencies in specification documents began to develop.

Discussion: The Military Departments have varying requirements for content, format, and procedures used in the preparation of system specification documents. The lack of effective control over the development of these documents in joint programs results in inconsistencies in their preparation. Without SRBs to monitor document preparation, contractors are in control of interpreting and pricing specification requirements, generally to the Government's disadvantage.

Lesson-Learned Data: Inconsistencies in Government-prepared specification documents create interpretation problems for the contractor. The use of SRBs in joint acquisition programs can alleviate this problem.

Appendix B. Summary of Potential Benefits Resulting From Audit

Recommendation Reference	Description of Benefit	Amount and/or Type of Benefit
A.1.a.	Economy and Efficiency and Internal Control. Will ensure adequate data for future program decisions.	Undeterminable Monetary Benefits. Unable to project future use.
A.1.b.	Economy and Efficiency and Internal Control. Will ensure adequate data for future program decisions.	Undeterminable Monetary Benefits. Unable to project future use.
A.2.	Economy and Efficiency. Will allow for more effective use of lessons-learned data base.	Undeterminable Monetary Benefits. Based on future use of system.
A.3.	Economy and Efficiency and Internal Controls. Will allow for more effective use of lessons-learned data base.	Undeterminable Monetary Benefits. Unable to project future use.
A.4.	Economy and Efficiency and Internal Controls. Will ensure adequate data for future program decisions.	Undeterminable Monetary Benefits. Based on future use of program.
B.1.	Program Results. Will result in more effective use of Ad Hoc group's resources.	Nonmonetary.
B.2.	Program Results. Will ensure JLC's goals are achieved.	Nonmonetary.

Appendix C. Activities Visited or Contacted

Office of the Secretary of Defense

Office of the Assistant Secretary of Defense (Production and Logistics), Washington, DC

Department of the Army

Deputy Chief of Staff for Logistics, Washington, DC
Deputy Chief of Staff for Operations, Washington, DC
U.S. Army Materiel Command, Alexandria, VA
  U.S. Army Materiel and Readiness Support Activity, Lexington, KY
  U.S. Army Materiel Systems Analysis Activity, Aberdeen Proving Grounds, MD
U.S. Army Missile Command, Redstone Arsenal, AL
U.S. Army Tank-Automotive Command, Warren, MI
Forces Command, Ft. McPherson, GA
  1st Cavalry Division, Ft. Hood, TX
  Headquarters, U.S. Army Pacific Command, Ft. Shafter, HI
  H Company, 25th Aviation Regiment, Schofield Barracks, HI
Combat Development Center, Ft. Benning, GA
Combined Arms Center, Ft. Leavenworth, KS
National Training Center, Ft. Irwin, CA
U.S. Army Night Vision and Electro Optics Laboratory, Ft. Belvoir, VA

Department of the Navy

Office of the Assistant Secretary of the Navy for Research, Development and Acquisition, Washington, DC
Naval Air Systems Command, Washington, DC
  Naval Air Warfare Center, Patuxent River, MD
Naval Sea Systems Command, Washington, DC
  Ship Parts Control Center and Naval Sea Logistics Center, Mechanicsburg, PA
Naval Supply Systems Command, Washington, DC
Commander in Chief Atlantic, Norfolk, VA
Commander in Chief Pacific, Honolulu, HI
Fleet Marine Force Pacific, Honolulu, HI
Marine Corps Combat Development Center, Quantico, VA

Department of the Air Force

Deputy Chief of Staff for Logistics, Washington, DC
Headquarters, Air Force Materiel Command, Wright-Patterson Air Force Base, OH

Air Logistics Center, McClellan Air Force Base, CA
Air Logistics Center, Robins Air Force Base, GA
9th Air Base Wing, Logistics Group, Beale Air Force Base, CA
Aeronautical Systems Command, Eglin Air Force Base, FL
Headquarters, Air Combat Command, Langley Air Force Base, VA
Headquarters, Pacific Command Air Force, Hickam Air Force Base, HI
Headquarters, Air Force Operational Test and Evaluation Center, Kirtland Air Force Base, NM
Air Force Operational Test and Evaluation Activity, Eglin Air Force Base, FL

Non-Government Activities

General Dynamics Land Systems Division, Warren, MI

Appendix D. Report Distribution

Office of the Secretary of Defense

Under Secretary of Defense (Acquisition)
Director, Joint Staff

Department of the Army

Assistant Secretary of the Army (Research, Development and Acquisition)
Inspector General, Department of the Army
U.S. Army Deputy Chief of Staff (Logistics)
Commanding General, U.S. Army Materiel Command

Department of the Navy

Assistant Secretary of the Navy (Financial Management)
Assistant Secretary of the Navy (Research, Development and Acquisition)
Deputy Chief of Naval Operations (Logistics)
Commander, U.S. Marine Corps Research, Development and Acquisition Command
U.S. Marine Corps Deputy Chief of Staff (Installations and Logistics)

Department of the Air Force

Assistant Secretary of the Air Force (Acquisition)
Assistant Secretary of the Air Force (Financial Management and Comptroller)
U.S. Air Force Deputy Chief of Staff (Logistics)
Commander, Air Force Materiel Command

Defense Agencies

Director, Defense Logistics Agency

Non-DoD Organizations

Office of Management and Budget
U.S. General Accounting Office, National Security and International Affairs Division, Technical Information Center

Chairman and Ranking Minority Member of the following Congressional Committees and Subcommittees:

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
House Committee on Armed Services
House Committee on Government Operations
House Subcommittee on Legislation and National Security, Committee on Government Operations

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Part IV - Management Comments

Department of the Army Comments

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
RESEARCH DEVELOPMENT AND ACQUISITION
103 ARMY PENTAGON
WASHINGTON DC 20310-0103

REPLY TO
ATTENTION OF

01 SEP 1993

SARD-RP

MEMORANDUM FOR OFFICE OF THE INSPECTOR GENERAL
(AUDITING) DEPARTMENT OF DEFENSE

SUBJECT: Draft Report on Lessons Learned Programs Within the Military Departments (Project No. 2AG-50007)

In response to your memorandum subject above, dated June 24, 1993 the Army submits the following response:

Recommendation 1a. Modify existing policies to require the inclusion of acquisition-type lessons-learned data in the Army data base maintained by the Materiel Readiness Support Activity.

We agree with the recommendation contained in the report. We are developing a DA Pamphlet that covers the acquisition process. This new pamphlet will include provisions for an acquisition lessons-learned data base maintained by the Materiel Readiness Support Activity. We should publish the pamphlet in the 4th quarter of FY 1994.

Recommendation 1b. Require program offices to use the Army's formalized lessons-learned data during the development or modification of major weapon systems.

We also agree with this recommendation. The Army's Training and Doctrine Command is the Army's executive agent for lessons-learned and directs the Center for the Army Lessons-Learned Program. Although there is no requirement in the lessons-learned program for acquisition managers, the Army is broadening the Center's collection teams. Technical data will be maintained by the Army Materiel Command but will be processed through and shared by the Center for Army Lessons-Learned.

Recommendation 2. We recommend that the Army Deputy Chief of Staff for Logistics automate the Army's lessons-learned data into an easy-to-retrieve data base.

-2-

Integrated Logistics Support (ILS) Lessons-Learned provides the knowledge base for the Logistics Planning and Requirements Simplification System (LOGPARS). This is an ILS expert system based on artificial intelligence. ILS Lessons-Learned will be incorporated into the LOGPARS electronic bulletin board providing access to Lessons-Learned. Other automation Lessons-Learned will occur as priority or resources permit.

POC for this action is Mr. R. Finnigan, DSN 225-0506.

GEORGE J. SAVITSKE
Colonel, GS
Director, Acquisition
and Industrial Base Policy

Department of the Navy Comments

DEPARTMENT OF THE NAVY
OFFICE OF THE ASSISTANT SECRETARY
(Research, Development and Acquisition)
WASHINGTON, D C 20350-1000

23 AUG 1993

MEMORANDUM FOR THE DEPARTMENT OF DEFENSE INSPECTOR GENERAL

Subj: DRAFT REPORT ON LESSONS-LEARNED PROGRAMS WITHIN THE MILITARY DEPARTMENTS (PROJECT NO. 2AG-5007)

Ref: (a) DODIG Memo of 24 June 1993

Encl: (1) DON Response to Draft Audit Report

I am responding to the draft audit report forwarded by reference (a) concerning a lessons-learned program within the Department of the Navy.

The Department of Navy response is provided at enclosure (1). We generally agree with the draft report finding but believe that, if DODIG desires that the subject "lessons learned" specifically be addressed as a matter of "policy" to program managers, that it be incorporated into the DOD 5000 series instruction and manual. Notwithstanding, we will initiate a memo to program managers advising them of the availability of a variety of operational "lessons learned" data bases to assist them in the acquisition process and encourage their use.

Edward C. Whitman

Edward C. Whitman

Copy to:
NAVINSGEN
NAVCOMPT (NCB-53)

Department of the Navy Response

to

DODIG Draft Report of June 24, 1993

on

Lessons-Learned Programs Within the Military Departments
Project No. 2AG-5007

Finding A:

Program offices responsible for acquiring major weapons systems were not adequately evaluating and disseminating lessons-learned data during weapon systems development and modification. The Army and Navy had not implemented adequate policies for identifying, analyzing, and disseminating lessons-learned data. The Air Force had adequate policies in place; however, program offices were not adhering to these policies. Consequently, acquisition officials did not benefit by avoiding past mistakes or profiting from positive results derived from data collected from extensive reporting systems of the Services.

Recommendation A-3:

We recommend that the Assistant Secretary of the Navy (Research, Development, and Acquisition) revise existing policies to require program offices to access lessons-learned data bases during weapon system development and modifications.

DON Position:

Partially concur. DOD Instruction 5000.2 already requires the use of lessons learned data. Specifically, it requires review of lessons learned, prior deficiencies and problem areas, and hazards in many functional areas, such as:

- Maintainability analyses (Part 6 pages 6-C-4)
- Software error data collection (6-D-1-2)
- Human factors (6-H-3),
- System safety, health hazard, and environmental effects (6-I-6)
- Government-Industry Data Exchange (GIDEP) (6-N-2)
- Risk templates-major risk areas common to defense programs (6-O-3)
- Contractor quality data (6-P-2)
- Quality deficiency reporting (6-P-3)
- Support cost drivers (Part 7 pages 7-A-2-2)
- Manpower impact compared to predecessor system(s), safety and health hazards, and current human system cost drivers (7-B-3)

- Offeror's recent and past history relative to such indicators as quality, timeliness, cost, schedule, operational effectiveness and suitability (Part 10 page 10-B-6)

The DOD Directive 5000.1 specifically directs that the requirements therein shall not be supplemented except as prescribed by statute or with prior approval of DOD (Cover memo of DODD 5000.1 dated 23 Feb 91, para. G). Thus, if other "lessons learned" areas need to be reviewed by the program offices as a matter of policy, recommend these requirements be identified by USD(A&T) for incorporation in subsequent revisions to DODI 5000.2.

In the meantime, Navy will initiate a memo to the program managers advising them of the availability of operational "lessons learned" data bases, such as, 3M, quality deficiency reporting, engineering investigations, etc., to assist them in the acquisition process and encourage their use. This memo will be issued by 30 September 1993.

Department of the Air Force Comments

DEPARTMENT OF THE AIR FORCE
WASHINGTON DC

26 AUG 1993

OFFICE OF THE ASSISTANT SECRETARY

MEMORANDUM FOR DOD IG

SUBJECT: Air Force Comments to DOD Draft Audit Report On Lessons-Learned Programs Within the Military Departments (Project No. 2 AG -5007) --INFORMATON MEMORANDUM

The attached memorandum is the Air Force Response to the subject report.

The SAF/FMPF point of contact is Mr. Harvey R Morford, extension 7-6051.

VAUGHN SCHLUNZ
Director for Audit
Liaison and Followup
(Financial Management)

Atch
Air Force response

Department of the Air Force Comments

DEPARTMENT OF THE AIR FORCE
WASHINGTON DC

23 AUG 1993

OFFICE OF THE ASSISTANT SECRETARY

MEMORANDUM FOR SAF/FMP

SUBJECT: Air Force Response to DoD IG Draft Report on Lessons-Learned Programs Within the Military Departments, (Project No. 2 AG-5007) - ACTION MEMORANDUM

We agree an active lessons-learned program would have numerous potential benefits to the acquisition process. The Air Force has the appropriate systems and policies in place. It is an effective program. In addition to the existing Air Force Lessons-Learned database, HQ AFMC has developed the Air Force Acquisition Model (AFAM), a PC-based application that provides information for Air Force weapon systems acquisition tasks across all functional disciplines. AFAM has been distributed throughout the Air Force and is readily available for use. Air Force policy has been enhanced through the inclusion of lessons learned requirements in the approved AF Supplement 1/DoD 5000.2, Defense Acquisition Management Policies and Procedures (Atch 1). At attachment 2 are our specific comments

We feel that the Air Force has an adequate lessons-learned system in place and is taking steps to educate its program managers to the benefits of these programs. As with all efforts of this type, time and training will be our most important ally.

JAMES S. CHILDRESS, Brig Gen, USAF
Dep Asst Sec (Mgt Policy & Program Integration)
Assistant Secretary of the Air Force (Acquisition)

Attachments
1. Copy AF Supplement 1/DoDI 5000.2
2. Comments on Draft DoD IG Report

AF Sup. 1/DoDI 5000.2
Part 11E
February 93

PART 11

SECTION E (Added) (AF)

AIR FORCE LESSONS LEARNED

References: (a) AF Sup 1, DoD 5000.2-M (Added) (AF)

1. (Added) (AF) PURPOSE. Establish procedures to identify, document, and publish acquisition and operational lessons learned.

2.d. (Added) (AF) POLICY. An effective program to share both positive and negative lessons learned is of significant benefit to the Air Force. All Air Force functional activities will provide appropriate lessons, in the proper format, at the time the lessons occur, for inclusion in the lessons learned data bank. Each program office will periodically review the appropriate lessons learned data bank and apply the applicable best practices.

3.c. (Added) (AF) Submission Procedures. All persons involved with acquisition and operational programs are responsible for submitting lessons learned. Submit all lessons in the format described in AF Sup 1, DoD 5000.2-M to ASC/CYM, Wright-Patterson AFB, OH 45433-5000.

1

3.d. (Added) (AF) Retrieval Procedures. To retrieve lessons from the data bank or request on-line access, forward a letter to ASC/CYM.

4.b. (Added) (AF) RESPONSIBILITIES. ~~CSTI/AM~~ ASC/CYM, the system program director for the Air Force Lessons Learned Program, will:

(1) Conduct an annual revalidation of lessons contained in the data bank.

(2) Publish an index of lessons learned.

AF Sup. 1/DoDI 5000.2
Part 12B
February 93

PART 12

SECTION B

JOINT/MULTISERVICE PROGRAMS

References: (c) AFSC/AFLC/AMC/NMC Memorandum of Agreement,
(Added) (AF) 20 July 1973, on the Management of
Multi-Service Systems/Programs/Projects

1. (AF) This section implements the Joint Logistics Commanders" Memorandum of Agreement on the Management of Multi-Service Systems/Programs/Projects, reference (c).

3.c.(5) (Added) (AF) For programs for which the Air Force is designated the lead DoD component, the Air Force will:

(a) Assign the SPD/PM.

(b) Establish an official manning document for the system program office that will incorporate the positions to be occupied by representatives of the participating Services. The manning document shall designate a key position for occupancy by the senior representative from each of the participating Services. This key position will report directly to, or have direct access to, the SPD/PM. This key position could include assignment as Deputy System Program Director/Program Manager. The Deputy SPD/PM will function as the participating Service's representative, with responsibilities and authorities as outlined

1

COMMENTS
ON
CHANGES TO DoDI 5000.2

Reference Page 10, Part II, **Consequences and Benefits**, Second Paragraph under Consequences: The slip in the Navy's AMRAAM initial operating capability (IOC) date is not a result of any development problems with the missile, but rather with F/A-18 software problems. The Navy only recently fielded an operational flight program for their F/A-18 that could support AMRAAM. Therefore, the slip of the Navy IOC date is not valid consequence of a failure to use a lesson-learned program.

Reference Page 13, Recommendation 4: Concur. Air Force is working to institute a set of specific processes for each of our major systems acquisition areas. Our single manager concept will alleviate many of these problems. The implementing document for DoDI 5000.2 will assist in enforcing this policy. In the test arena, the Single Face to the Customer offices will also standardize a methodology for test program design and execution. As a result, lessons-learned will naturally accumulate and improve the test processes-the processes will then disseminate the lessons to other test programs

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INTERNET DOCUMENT INFORMATION FORM

A . Report Title: Acquisition-Type Lessons-Learned Programs Within the Military Departments

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C. Report's Point of Contact: (Name, Organization, Address, Office Symbol, & Ph #): **OAIG-AUD (ATTN: AFTS Audit Suggestions)**
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D. Currently Applicable Classification Level: Unclassified

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