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# ACQUISITION STREAMLINING: PROGRESS AND CHALLENGES

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Fred L. Adler

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6400 Goldsboro Road
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## Executive Summary

# ACQUISITION STREAMLINING: PROGRESS AND CHALLENGES

Acquisition streamlining began as a DoD-wide effort to eliminate unnecessary specifications and standards for major weapon systems and to make others more specific to the application. It has also given industry more opportunity to be innovative by conveying performance instead of process requirements. That initial success has led to the expansion of acquisition streamlining's scope to include procurement procedures and the requirements definition process.

The Military Departments are pursuing acquisition streamlining in their own ways. The Army has aggressively embraced the initiative by completely revising its entire acquisition system; the Navy has integrated acquisition streamlining into a Navy-wide productivity improvement program; and the Air Force has emphasized faster and more efficient acquisition through changes in its organizational structure and acquisition procedures.

In the Military Department experience, several streamlining approaches stand out as effective.

- Avoiding premature use of specifications and standards
- Tailoring specifications to meet application-unique requirements
- Conducting tradeoff analyses of cost and performance in establishing and updating performance requirements
- Using nondevelopmental items rather than undertaking new development.

To refine and enhance those acquisition streamlining strategies further, we recommend that the Military Departments take the following actions:

- Prior to full-scale development, use specifications and standards only as guidance.
- Limit the application of specifications and standards in full-scale development to those that are cited or directly referenced in the contract; exclude those that are indirectly referenced only.

- To facilitate the tailoring of specifications, use aids such as the Air Force's MIL-PRIME where application-unique values must be added.
- Promote the development of automated systems for tailoring specifications. An example of such a system is the Navy's Automated Specifications and Standards Information System.
- Update performance requirements on the basis of cost-performance tradeoff analysis. Both the Air Force's new operational requirements procedures and the Army's requirements initiatives are promising steps in this direction.
- Increase the emphasis and awareness of best-value contracting – contracting that offers the Government the best combination of *performance and price – and encourage contracting officers to pursue* contract awards that offer the best value.
- Evaluate use of nondevelopmental items and existing commercial products in source selections based upon factors other than price alone.

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# CHAPTER 1

# INTRODUCTION

## EVOLUTION OF ACQUISITION STREAMLINING

Acquisition streamlining was originally conceived as a means to improve the use of specifications and standards. In the mid-1970s, the Defense Science Board (DSB) examined the effect of specifications and standards on the cost of materiel acquisition and concluded that while their contents created no problems, the extent to which they were applied and enforced in requests for proposals (RFPs) and contracts did affect cost [1-1]. Thus, in 1977 the Deputy Secretary of Defense promulgated a DoD Directive (DoDD 4120.21) to govern the application of specifications, standards, and related documents in the acquisition process. That DoDD was revised in 1980.

In 1981, the Defense Acquisition Improvement Program (the 32 acquisition initiatives of Deputy Secretary of Defense Carlucci) was instituted. It called for improving all contract requirements[1], not merely the specifications and standards, and it addressed the problem that requirements are too frequently imposed in blanket fashion early in a program in a way that prematurely constrains the design or contractor procedures. In early 1986, DoDD 5000.43 instituted an acquisition streamlining initiative directed toward remedying this problem. It is based on the concept that the application of pertinent contract requirements and early industry involvement in recommending the most cost-effective solutions can reduce the cost and/or time of system acquisition and the life-cycle cost without degrading system effectiveness.

In 1986, the President's Blue Ribbon Commission on Defense Management (the Packard Commission) made nine major recommendations on DoD acquisition procedures and organization, and OSD and the Services are now implementing them

[1] According to the 1986 acquisition streamlining directive (DoDD 5000.43), contract requirements are those requirements, in addition to specified performance requirements, defined in the statement of work (SOW); specifications, standards, and related documents; the contract data requirements list (CDRL); management systems; and contract terms and conditions.

in various ways [1-2]. The DoD acquisition streamlining initiative offers a useful approach to carrying out those Commission recommendations that involve streamlining of the acquisition process: the development of acquisition organizations with short, unambiguous lines of authority to streamline the acquisition process and cut through red tape; the establishment of procedures for ensuring better decisions on weapons requirements and for selecting programs for development based on early tradeoffs between cost and performance; and the increased use of commercial-style competition, commercial practices, and commercial products.

A key Packard Commission recommendation on balancing cost and performance is based largely on the results of the DSB recommendations on formulating practical, functional performance requirements [1-3]. As both the DSB and Packard Commission noted, prior to the full-scale development (FSD) phase of acquisition, milestones reviews have been adequate to determine whether proposed specifications will meet stated user requirements; they have *not*, however, been a viable mechanism for challenging those requirements. What both recommend is an informed tradeoff between user requirements on one hand and schedule and cost on the other. That tradeoff has been a major thrust of the DoD acquisition streamlining initiative.

## ACQUISITION STREAMLINING TODAY

### DoD Policy

According to DoDD 5000.43, the first priority of acquisition streamlining is to streamline solicitations and contract requirements by specifying performance requirements in terms of results desired rather than in terms of how to provide them; precluding premature application of design solutions, specifications, and standards; tailoring contract requirements to unique program circumstances; and limiting the contractual applicability of referenced documents.

The directive promotes the development of innovative and cost-effective requirements and acquisition strategies that result in efficient utilization of resources to produce quality weapon systems and products. OSD is currently preparing a handbook[2] to provide detailed guidance for application of the policy; it is

[2] DoD HDBK 248B, *Acquisition Streamlining*, Final Draft, 15 Oct 1987.

now in the final coordination stage prior to official issuance. Proposed changes to the Federal Acquisition Regulation (FAR) are being finalized. Three major DoD-wide conferences have been held to note progress in implementing the acquisition streamlining initiative.

## Implementation

All three Military Departments are implementing acquisition streamlining by tailoring streamlining implementation to their own institutional styles and approaches. The Army has aggressively embraced the initiative in the Army Streamlined Acquisition Process (ASAP), a complete revision to its entire acquisition system. Key features of ASAP are the use of streamlined requirements, mature technology, and preplanned product improvement and the placement of emphasis on operational evaluations and smooth transition from development to production.

The Navy has integrated acquisition streamlining into a Navy-wide productivity program called Action '88. That program combines streamlining with value engineering, use of nondevelopmental items (NDI), better use and content of specifications and standards, and productivity improvement supported by recognition and training programs.

The Air Force has streamlined its acquisition structure and process while applying streamlining techniques to individual programs and contracts. It has begun implementing a requirements validation process that maintains requirements flexibility while systematically performing cost/performance tradeoffs during the acquisition cycle.

Acquisition streamlining is also integral to OSD's approach to industrial productivity and quality and is a key element of production support. The streamlining concept involves defining the minimum essential set of requirements for system design, development, and production by industry and ensuring that those requirements are satisfied in a way that minimizes the burden on industry and gives it the maximum freedom to propose design solutions. To define the minimum essential requirements, streamlining reaches across all functional areas to integrate the essential requirements of each.

## ACQUISITION STREAMLINING ACCOMPLISHMENTS

### Recent Results

The initial group of four acquisition programs to be streamlined – the Navy's T-45 Training System, the Army Experimental Light Helicopter (LHX), the Air Force C-17 transport aircraft, and the Joint-Service V-22 tilt-wing aircraft – has grown. In 1985, OSD decided to track progress in streamlining by surveying those programs that the Services had designated as pioneer streamlining programs. The programs in the survey are listed in Table 1-1.

The OSD survey revealed those streamlining techniques that are most used. They are shown in Figure 1-1 along with the number of the 30 programs in which they were used. Involving industry in the requirements generation process, using performance requirements in work descriptions, and tailoring specifications to specific acquisition were the most frequently used streamlining procedures. The use of NDI – off-the-shelf parts or those developed for other programs – was the next most popular. Although only the 15 most prevalent techniques are shown in the figure, some 40 different ones were reported.[3]

### Award-Winning Examples

Not only acquisition programs that have been streamlined but acquisition procedures and approaches as well have received awards. At the 1986 acquisition streamlining conference, the Deputy Secretary of Defense presented awards to the Navy T-45 program, the Army LHX program, the Air Force Ballistic Missile Office, and the Marine Corps V-22 program. At the 1987 acquisition streamlining conference, eight awards were presented for Army, Navy, Air Force, and Marine Corps streamlining accomplishments. Table 1-2 lists the awards and accomplishments.

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[3]Details of the survey results are available in Logistics Management Institute (LMI) Report AL609TR1, *A Survey of Acquisition Streamlining in Weapon Systems Programs*, Jan 1987. Further details are contained in a separately bound supplement to the report, *Acquisition Streamlining Survey and Survey Responses*, Jan 1987.

TABLE 1-1

RESPONDING STREAMLINED PROGRAMS

| Military department | Program |
|---|---|
| Army | Experimental Light Helicopter (LHX)<br>Advanced Antitank Weapon System-Medium (AAWS-M)<br>Family of Medium Tactical Vehicles (FMTV)<br>Army Tactical Missile System (ATACMS)<br>120 mm Mortar System<br>Mobile Subscriber Equipment (MSE) |
| Navy | Undergraduate Jet Flight System (T-45TS)<br>Joint Services Advanced Vertical Lift Aircraft (V-22)<br>Replacement Inner Zone Air ASW Vehicle (CV IZ HELO)<br>Amphibious Assault Ship (Multipurpose) (LHD)<br>Patrol Combatant Multi-Mission Ship (PXM)<br>Afloat Correlation System (ACS)<br>Extremely High-Frequency (EHF) Satellite Communications Terminals<br>Relocatable Over-the-Horizon Radar (ROTHR)<br>Ship Launched Electronic Decoy (SLED)<br>Presidential Aircraft (VH-60)<br>Fast Attack Submarine (SSN-21) |
| Air Force | Advanced Tactical Fighter (ATF)<br>Advanced Tactical Fighter Engine (ATFE)<br>Integrated Electronic Warfare System (INEWS)<br>Worldwide Information System (WIS) Modernization<br>Advanced Medium Range Air-to-Air Missile (AMRAAM)<br>Peacekeeper Intercontinental Ballistic Missile (ICBM)<br>Small ICBM (SICBM)<br>MILSTAR<br>Local On-Line Networking System (LONS)<br>Joint Surveillance Target Attack Radar System (JSTARS)<br>Anti-Radiation Missile (ARM) Decoy<br>Titan T34D7 Space Booster/Complementary Expendable Launch Vehicle (CELV)<br>Direct Airfield Attack Combined Munition (DAACM) |

## THE ROLE OF ACQUISITION STREAMLINING IN THE DoD ACQUISITION PROGRAM

Acquisition streamlining is certainly important to the DoD acquisition program. However, it is not an end in itself; the end is improved – i.e., more cost-effective – acquisition programs and processes. Implementing acquisition streamlining requires, as the Air Force has noted in its approach, both leverage and balance

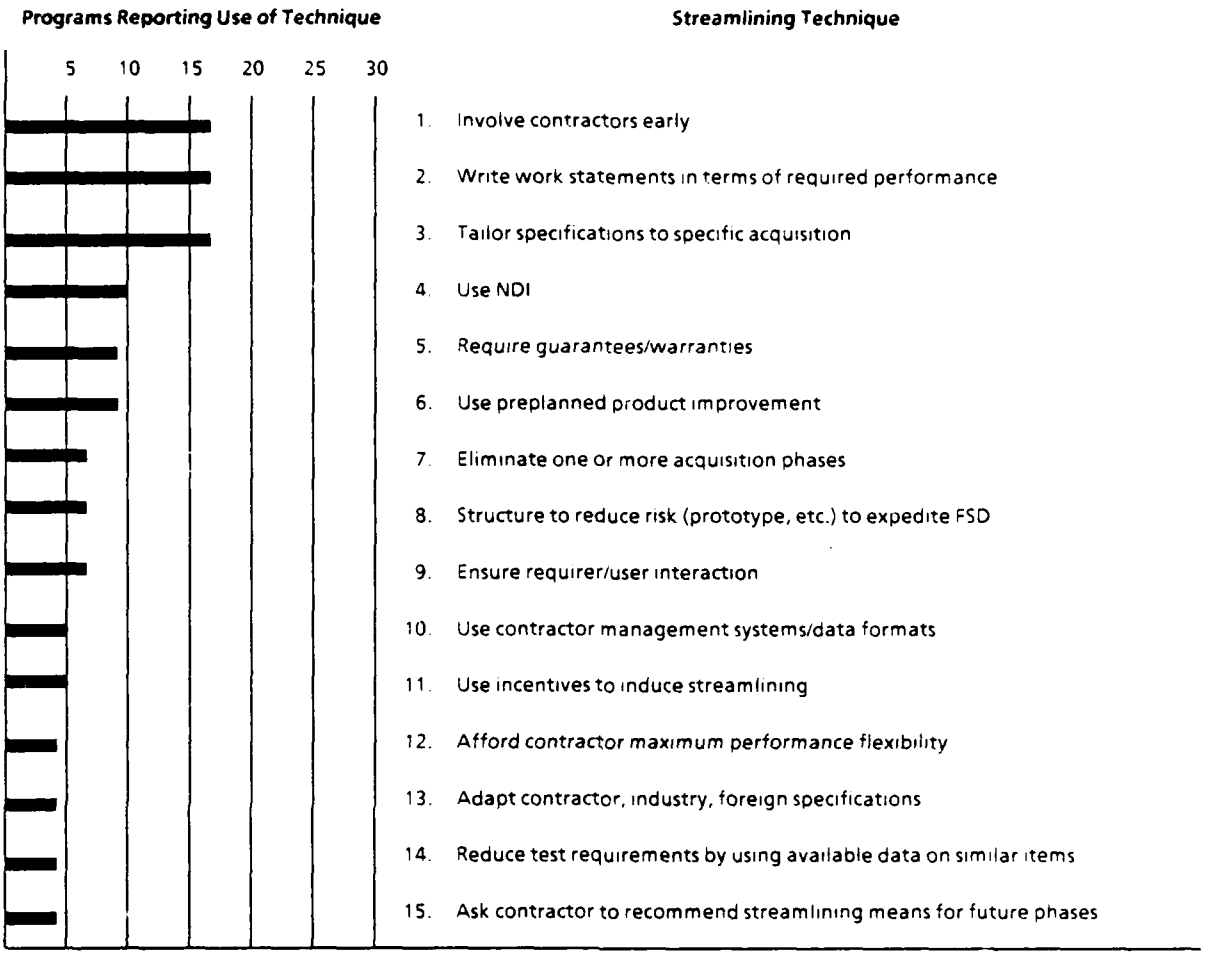


**FIG. 1-1. STREAMLINING TECHNIQUES REPORTED IN THE SURVEY**

to change the entrenched culture. The leverage comes from targeting those areas that have greatest potential for long-term payoff while balancing implementation across the full spectrum of acquisition activities ranging from overall structure and process improvements to specific applications on individual programs and contracts. Following that approach, as the overall DoD acquisition organization evolves, streamlining can identify and disseminate those tools with the highest payoff in specific areas and work to reach across all functional areas.

Streamlining is also important as a means for satisfying major DoD acquisition and logistics objectives: identifying legislative and policy constraints encountered in implementing acquisition programs and ways to overcome them; fostering practices that enhance development of the industrial base by using less-restrictive

## TABLE 1-2

## ACQUISITION STREAMLINING AWARDS

| Service | Program | Year of award | Streamlining activity |
|---|---|---|---|
| **Army** | Experimental Light Helicopter (LHX) | 1986 | Developed LHX engine solicitation with performance-oriented specifications allowing contractor guarantees of prices and quality. |
| | Army Streamlined Acquisition Process (ASAP) | 1987 | Formulated ASAP concept institutionalizing a streamlined regulatory structure. |
| | Army Tactical Missile System (ATACMS) | 1987 | Reduced number of specifications, standards, and other contract requirements; used draft RFPs; maximized use of available technology; and planned a 4-year FSD phase. |
| **Navy** | T-45 Training System | 1986 | Used a product-improved engine and reduced the number of specifications and data requirements. |
| | Consolidated Automated Support System (CASS) | 1987 | Reduced the number of specifications and data requirements, eliminating "how-to" aspects; reduced engineering development model and test requirements; eliminated the need for an interim contractor; and provided incentives for contractor-proposed computer-aided logistics support initiatives. |
| | Sea Lance Weapon Program | 1987 | Tailored system-level specifications to meet operational requirements; allowed contractors to tailor system specification for their proposed concept; modified temperature operating condition based on environmental studies; and continued tailored application of specifications and standards through FSD. |
| **Air Force** | Ballistic Missile Office | 1986 | Reduced the time spent in source selection by 40 percent to about 100 days. |
| | Advanced Tactical Fighter (ATF) | 1987 | Adopted a combined baselining/streamlining/quality assurance thrust; encouraged early contractor involvement in tailoring specifications and RFP; developed SOW as a MIL-PRIME specification; and streamlined source selection. |
| | Functional Contracting for Repair Items | 1987 | Improved customer support and reduced leadtime by developing "add-on" clauses that allow for modification of additional repair items at prenegotiated rates subsequent to contract award |
| **Marine Corps** | V-22 Advanced Vertical Lift Aircraft | 1986 | Reduced program cost through specification tailoring under a fixed-price contract; reduced SOW requirements; and decreased contract deliverables. |
| | Improved Direct Air Support Central | 1987 | Used NDI and required contractor demonstration of equipment during proposal evaluation; tailored data requirements; and shortened acquisition time to 25 months. |
| | Albany Logistics Base | 1987 | Adopted spares acquisition with support concept, adapted NDI; and developed simplified reprocurement technical data and purchase descriptions |

specifications and encourage broader-based competition; improving quality by requiring the definition of essential requirements and using a less-intrusive method of ensuring that those requirements are met; encouraging professional judgment and discretion in the acquisition work force; and working closely with industry in addressing acquisition problems of all types.

## PURPOSE OF THIS REPORT

This report provides a baseline and frame of reference for viewing future acquisition streamlining progress and notes the key challenges that remain. It identifies those streamlining techniques that have proved effective and suitable for wide application. In doing so, we address certain issues key to the success of acquisition streamlining.

Progress has been made throughout DoD in improving the use of and the quality of specifications and standards; that progress must be solidified and extended. Even though tailoring and application guidelines are available, they are not being consistently applied. Furthermore, those specifications and standards that have been identified as burdensome or counterproductive must be updated, otherwise modified, or canceled.

Contracting officers must become more confident in developing and ensuring the implementation of streamlined contracts, and streamlining must be recognized and encouraged within the contracting community. The contracting officer and engineering community must become willing to specify requirements in terms of satisfying performance rather than seeking compliance with detailed specifications.

The concept of basing acquisition decisions (including source selection) on best value must become a natural acquisition concept. Program managers and users must both understand the best-value concept in terms of possible tradeoffs in performance and cost. The contracting officer must understand that the best-value concept reflects a range of requirements in solicitations involving NDI and that understanding must be reflected in contracting officer decisions during source selection.

Finally, streamlining must become institutionalized without becoming burdensome. Leadership is required at the highest level in DoD acquisition to carry the streamlining approach forward and to reflect streamlining in the foundation of

DoD acquisition policy. Relationships must be developed among streamlining and other objectives (e.g., quality, manufacturing, requirements) to integrate objectives. Training is required to reorient the acquisition culture and to reflect acquisition streamlining principles, examples, successes, and new initiatives. Program oversight must provide DoD leadership the means to track programs, better measure progress, and achieve success through the cooperative efforts of advocates of streamlining throughout DoD.

# CHAPTER 2

# USING SPECIFICATIONS AND STANDARDS PROPERLY

Specifications are used to support the acquisition of items of varying degrees of complexity. They establish the levels of performance needed to satisfy the item's mission. In some applications, complete design detail may be specified. Standards, which are often called for in specifications, establish the need for standard engineering and technical processes, procedures, practices, and methods. When specifications and standards are applied, they should be tailored on the basis of unique program circumstances. Currently, the DoD Index of Specifications and Standards (DoDISS) consists of more than 45,000 entries (including military specifications and standards, other Federal specifications and standards, and non-Government standards that have been adopted for DoD use).

## PROBLEMS IN USING SPECIFICATIONS AND STANDARDS

In recent years, a number of studies have concluded that, by and large, military specifications and standards are well written and generally adequate to meet DoD needs. Those studies point out that problems arise when specifications and standards are misapplied. Underapplication, overapplication, lack of tailoring, and excessive chain referencing are all examples of such misapplication.

The results of the DSB Task Force on Specifications and Standards continues to be the primary foundation for improving specifications and standards [1-1]. The task force's recommendations call for developing an improved climate of application (which is now provided by acquisition streamlining) and following that with a longer range program to revise and consolidate the existing body of specifications and standards, emphasizing increased flexibility and reduced cost of application. The recent DSB Task Force on Use of Commercial Components in Military Equipment points out that many specifications include details that inhibit the consideration of commercial alternatives and limit the program manager's ability to make smart tradeoff decisions [2-1].

Certain specifications and standards remain as "problem" documents that continue to cause difficulty in application and are counterproductive. They may

specify how to manage, call for premature application of development or production technical requirements, be unrealistic or nonessential, or be obsolete. In contrast, a tailored specification would provide notification of when certain requirements are optional and under what circumstances they apply.

The obvious solution to these problems is to take advantage of the climate for proper application provided by acquisition streamlining, use the available tools and techniques that allow proper application of specifications and standards, and fix those specifications and standards that are counterproductive.

## PROBLEM SPECIFICATIONS AND STANDARDS

The effort to fix problem specifications should be enhanced. Currently, separate but coordinated efforts are under way to identify and resolve counter-productive requirements. The Army and the Air Force have ongoing efforts, and industry, through the Council of Defense and Space Industries (CODSIA), also has an effort under way. In addition, DoD has established supporting policy.

### Army and Air Force Efforts

The Army Materiel Command (AMC) challenged industry to identify problem specifications and standards [2-2] and received 95 responses to that challenge. From the 41 issues identified, the 12 most troublesome specifications were identified (see Table 2-1). Five of the 12 specifications involve electronic components – an area of rapidly changing technology. Examples of issues, specific problem areas, and proposed actions are shown in Table 2-2 for engineering drawing practices, environmental test practices, microcircuits, and soldering. For example, the Army concluded that MIL-S-45743 specification on soldering contains detailed implementation instructions (how-to's) and conflicting assembly requirements that limit flexibility. That specification needs to be updated to eliminate unnecessary testing. It does not provide definitive guidance on soldering environments or on specific soldering applications. A new soldering standard in preparation, DoD-STD-2000, will eliminate unnecessary redundancy and testing, reduce requirements for noncritical defect rework, and clarify ambiguous criteria.

The Air Force is taking a different approach than that of the Army. It has asked that each of its six product divisions in Air Force Systems Command (AFSC) and nine logistics support centers in Air Force Logistics Command (AFLC) to

TABLE 2-1

TOP 12 PROBLEM SPECIFICATIONS AND STANDARDS

| Specification/ standard | Application | Frequency of identification |
|---|---|---|
| **MIL-M-38510** | Microcircuits | 15 |
| **MIL-Q-9858** | Quality program requirement | 14 |
| **DoD-STD-100** | Engineering drawing practices | 13 |
| **MIL-STD-490** | Specification practices | 11 |
| **MIL-S-45743** | Soldering | 9 |
| **MIL-STD-810** | Environmental test practices | 9 |
| **MIL-STD-1520** | Nonconforming materials | 8 |
| **MIL-STD-454** | Requirements for electronic equipment | 7 |
| **DoD-STD-2167** | Software development | 7 |
| **MIL-P-28809** | Printed wiring assemblies | 6 |
| **MIL-P-55110** | Printed wiring boards | 6 |
| **DoD-STD-480** | Configuration control | 6 |

***Note:*** Per AMC specifications and standards review. Based on 95 industry responses.

indicate which specifications and standards are useful to their engineers and acquisition managers. Preliminary data from three of six AFSC divisions and three of nine AFLC centers show that perhaps as many as half of the specifications and standards now assigned to a division or center for maintenance are no longer needed by program managers in those organizations.

## Council of Defense and Space Industries Efforts

Under CODSIA Case 83-23, industry is also identifying technical documents that are counterproductive [2-3]. Table 2-3 lists the documents that CODSIA members believe have problems and the sources of the problems. Most of the documents are in three areas: management systems, electronics components, and software. Eight of the 25 documents specify detailed management system requirements for establishing specific contractor management procedures. Industry feels that they either specify how-to-manage, direct premature application of management systems, or establish unnecessary or unrealistic management requirements. Six documents involve electronic components that industry feels have outdated parts

## TABLE 2-2

## EXAMPLES OF SPECIFIC PROBLEM AREAS

| Standard or specification | Issue | Specific problem area | Actions |
|---|---|---|---|
| **DoD-STD-100 (Standard)** | DoD-STD-100 is not up to date and is often improperly applied or tailored to actual applications. | DoD-STD-100, "Engineering Drawing Practices," is not being properly tailored by data managers. It contains deficient drawing practices and should not be applied against hybrid microelectronic assemblies. | • Application instructions will be updated to remind data managers of tailoring techniques and requirements.<br>• Drafting practices will be revised to include computer-aided drawing practices and eliminate duplicate drawings. A handbook published in April 1987 will resolve drafting standard differences among commands.<br>• Standard military drawing instructions will be published in Notice No. 5 to DoD-STD-100.<br>• A study is currently in process to address the application of DoD-STD-100 against hybrid microelectronic assemblies. |
| **MIL-STD-810 (Standard)** | MIL-STD-810 is excessively stringent, inconsistent with other standards, and often inappropriately applied to the component level. | MIL-STD-810, "Environmental Test Methods and Engineering Guidelines," places overstringent requirements on a system. It results in overdesign with associated high cost. It does not give appropriate *environmental data and causes in inappropriate testing.* It should only be applied to the subsystem level and not to the component level. | • Requirements indicated to be overstringent are being evaluated by test elements of the preparing activity.<br>• Army Missile Command's specification and data requirements review board will consider testing guidance changes for incorporation in the next revision.<br>• Change Notice No. 1, fielded November 1986, impacts several of the test method recommendations. |
| **MIL-M-38510 (Specification)** | MIL-M-38510 is in conflict with other documents, *unrealistic, and overly restrictive. There are also* misperceptions on the part of industry. | MIL-M-38510, "Microcircuits, General Specification for *Stated Electrical Parameters," conflicts with other* documents and with realistic producibility considerations, calls for unrealistic sampling for small lot sizes, and has overly stringent/unrealistic burn-in requirements. | • Revision will add new microcircuits.<br>• Appendix C to MIL-M-38510 will be modified to reflect solder or mounting plane requirements for microcircuits.<br>• Conflicts among MIL-M-38510, MIL-STD-883, and DoD-STD-1686 over classification requirements will be resolved with Notice No. 5 to MIL-STD-883 and a revision to DoD-STD-1686.<br>• EIA/JC-11 committee on package standards has been requested to review recommended printed circuit board design changes.<br>• Technical misperceptions with participating contractors will be clarified. |
| **MIL-S-45743 (Specification)** | MIL-S-45743 is not reflective of modern technology, contains too many "how-to" and conflicting assembly requirements, and often results in excessive costs being applied. | MIL-S-45743, "Soldering Manual Type, High Reliability, Electrical and Electronic Equipment," contains too many "how-to" details. It limits assembly flexibility, requires updating to eliminate redundancy and testing, and lacks definitive guidance in the areas of soldering environment and specific soldering applications. | • MIL-S-45743 is being superseded by DoD-STD-2000 series. This will reduce specification redundancy, testing, noncritical defect rework, and ambiguous requirements/criteria.<br>• "How-to" requirements are included to assure a minimum quality level and corrective action if products are not contractually delivered. |

## TABLE 2-3

## COUNCIL OF DEFENSE AND SPACE INDUSTRIES ASSESSMENT OF SELECTED SPECIFICATIONS AND STANDARDS

| Specifications and standards that should be revised, converted, or canceled | Counterproductive DoD requirements | | | | | | Tailoring policy included (yes or no) |
|---|---|---|---|---|---|---|---|
| | Contains how-to-manage requirements | Calls for premature application | Establishes unrealistic requirements | Establishes nonessential requirements | Has outdated parts | Has other problems | |
| DoD-STD-100C Engineering Drawing Practices | | | X | X | X | X | No |
| DoD-STD-347 Product Assurance Program Requirements, Electrical and Fiber Optic Components (Proposed Revision A) | | | | X | | X | No |
| MIL-STD-454 General Requirements for Electronics Equipment | X | X | X | X | X | X | No |
| MIL-STD-785B Reliability Program Requirements | | | | X | | | No |
| MIL-STD-965A Parts Control Program | | | X | X | | X | Yes |
| DoD-D-1000B Drawings, Engineering and Associated lists | | | X | X | | X | Yes |
| MIL-STD-1520C Corrective Action and Disposition System for Nonconforming Material | X | | X | | | X | No |
| MIL-STD-1523 Age Control of Age-Sensitive Elastomeric Material (for Aerospace Applications) | X | | | X | | X | No |
| MIL-STD-1528A Manufacturing Management Program | | | | | | X | Yes |
| MIL-STD-1535 Supplier Quality Assurance | X | | X | | | | Yes |
| MIL-STD-1567A Work Measurement | X | X | X | | | X | Yes |
| DoD-STD-2000-1B Soldering Technology, High Quality/High Reliability | X | X | X | | | X | Yes (limited) |
| DoD-STD-2000-2 Part and Component Mounting for High Quality/High Reliability Soldered Electrical and Electronic Assemblies | X | X | X | | | X | Yes (limited) |
| DoD-STD-2000-3 Criteria for High Quality/High Reliability Soldering Technology | | | X | | | X | Yes (limited) |
| DoD-STD-2167 Defense Systems Software Development | X | | X | | | X | Yes |
| MIL-E-5400 Electronic Equipment, Airborne, General Specification for | X | X | | X | X | | Yes |
| MIL-Q-9858A Quality Program Requirements | | X | | | | | No |
| MIL-P-22809A Printed Wiring Assemblies | | | X | | | X | No |
| MIL-S-52779 Software Quality Assurance Program Requirements | X | | | | | X | Yes |
| AFSCP/AFLCP 173-5/DARCOM-P 715-5/ NAVMAT P2580/DLAH 8315.2 C/SCS Joint Implementation Guide | X | | X | | | X | No |
| DARCOM-P 750-16 Material Readiness Support Activity (MRSA) LSA/LSAR Software Programs and Commodity Command Standard System (CCSS) | X | | | | | X | No |

TABLE 2-3

COUNCIL OF DEFENSE AND SPACE INDUSTRIES ASSESSMENT OF SELECTED SPECIFICATIONS AND STANDARDS (Continued)

| Specifications and standards that should be revised, converted, or canceled) | Counterproductive DoD requirements | | | | | | Tailoring policy included (yes or no) |
|---|---|---|---|---|---|---|---|
| | Contains how-to-manage requirements | Calls for premature application | Establishes unrealistic requirements | Establishes nonessential requirements | Has outdated parts | Has other problems | |
| WS-6536 Procedures and Requirements for Preparation and Soldering of Electrical Connections | X | X | | X | X | X | No |
| AFSCMD Reg 178.16 Contractor Operations Reviews | X | | | | | | No |
| DFARS Clause 7-104.87 Cost Schedule Control System (C/SCS) | X | | | | | | No |
| DFARS Clause 7-2003.43 Notice of Cost Schedule Control System | X | | | | | | No |

or establish inappropriate requirements. Three documents involve software, an area of great complexity; they establish unrealistic requirements for the contractor to meet or contain how-to-manage requirements. Other documents involve soldering, materials, and engineering drawings that establish unnecessary or unrealistic requirements. Most fail to provide adequate policy on tailoring. DoD is currently evaluating industry's recommendations.

## DoD Document Cancellation Policy

In order to respond to concerns of specifying obsolete requirements, DoD has initiated a program to automatically cancel standardization documents that have not been revised, amended, validated, or activated for new design for 6 years. The lead standardization activity that manages the Federal supply class or standardization area under which a standardization document falls is responsible for preparing and coordinating the cancellation action. If no objections are received during coordination, the document is canceled. If an objection is received, the DoD activity registering the objection has 2 years to update the document or it will be canceled automatically.

## PROPER APPLICATION AND TAILORING OF SPECIFICATIONS AND STANDARDS

Policy for the proper application and tailoring of specifications and standards is provided in the acquisition streamlining directive, and additional guidance is contained in the acquisition streamlining handbook (DoD HDBK 248B). OSD has proposed revisions to the FAR and the DoD FAR Supplement (DFARS) to provide guidance in applying acquisition streamlining techniques, especially in the area of specification tailoring.

Basically, the policy, guidelines, and regulations call for specifying system-level requirements in operational terms at program initiation, applying specifications and standards for guidance only prior to FSD, tailoring them for application in FSD (including first-tier references only), and applying tailored specifications and standards at all the tiers necessary to establish a baseline for production and reprocurement.

### Streamlining Policy on Application and Tailoring

DoDD 5000.43 provides policy to ensure the development of cost-effective contract requirements, including specifications and standards, for acquisition programs. Specifications and standards related documents cited in solicitations and contracts come from the Acquisition Management Systems and Data Requirements Control List, the DoDISS, or other appropriate non-Government specifications and standards. The policy for the application and tailoring of specifications and standards and other related documents (handbooks, guides, etc.) by acquisition phase is shown in Table 2-4.

### Revisions to the FAR and the DoD FAR Supplement

Proposed revisions to the FAR and DFARS provide the regulatory coverage that is essential for implementation of acquisition streamlining by the contracting community. The revisions require that acquisition streamlining be incorporated in written acquisition plans prepared during acquisition planning (FAR and DFARS Section 7.105). They also provide policy for streamlined application and tailoring of specifications, standards, and other purchase descriptions [FAR and DFARS Section 10.002(c)] and specific guidelines for selecting specifications or purchase descriptions [DFARS Section 10.004(a)]. A specific clause, shown in Figure 2-1, requires implementation of streamlining, including proper application and tailoring

## TABLE 2-4

## POLICY FOR APPLICATION AND TAILORING OF SPECIFICATIONS AND STANDARDS

| | | | | |
|---|---|---|---|---|
| **General policy** | • Streamline the use of specifications and standards, as well as other contract requirements, at the onset of development and in each subsequent acquisition phase. Do not prematurely apply design solution or formulate and enforce detail requirements. | | | |
| | **Program initiation** | **Concept exploration and demonstration/validation** | **FSD** | **Production** |
| **Policy by acquisition phase** | • At the onset of development, specify system-level requirements *in terms of mission* performance, operational effectiveness, and operational suitability.<br>• Critically review all requirements, including specifications and standards, for pertinence and cost-effectiveness. Involve industry early in this review. | • Prior to FSD, except when items already developed are to be used or when the *early application* of fully tailored acquisition support planning or design constraints have been directed, cite specifications and standards for guidance only and in the course of contract performance evaluate them.<br>• If pertinent and cost-effective for this acquisition program, tailor them for contractual application in FSD. | • For FSD contracts, with the same exceptions noted in pre-FSD contracts, limit the application of specifications, standards, and related documents to those specifically cited in the contract as requirements and to specified portions of directly referenced specifications and standards (first-tier references).<br>• All other references (second tier and below) are for guidance only. | • For production contracts, those specifications and standards to the tiers identified as the baseline for production are applicable for production and reprocurement purposes.<br>• Continue streamlining throughout production to ensure only essential requirements, including specifications and standards, are included in follow-on production contracts. |
| **Other policy considerations** | • When items already developed are used, all applicable specifications and standards that define the product baseline become contract requirements, irrespective of acquisition phase.<br>• During all acquisition phases, state management requirements *including specifications and standards in solicitations and contracts* in terms of results needed rather than how-to-manage procedures for achieving those results. Specify the minimum management data required to satisfy program needs. Make all data requirements consistent with task requirements and DoD policy on managing technical data.<br>• Under terms of their contract, contractors shall provide recommendations for application and tailoring of contract requirements, including specifications and standards, in one phase for proposed application to the succeeding phase. Implementation of these recommendations is subject to approval of the Government program manager. | | | |

DFARS

Part 52 – SOLICITATION PROVISIONS AND CONTRACT CLAUSES

[52.210-7005 Acquisition Streamlining

As prescribed in 10.011(73), insert the following clause:

ACQUISITION STREAMLINING (Date)

(a) It is the objective of the Government to acquire systems that meet stated performance requirements. The Government also desires to avoid over-specification and to ensure that cost-effective requirements are included in future acquisitions. The contractor shall prepare and submit acquisition streamlining recommendations in accordance with the statement of work of this contract. These recommendations shall be formatted and submitted as identified in the contract data requirements lists (CDRL). However, recommendations may be accepted, modified, or rejected by the Government.

(b) The contractor shall insert this clause, including this paragraph (b), in all subcontracts in excess of $1.0 million.]

**FIG. 2-1. ACQUISITION STREAMLINING CLAUSE**

of specifications, in contracts for all system acquisition programs and in all subcontracts in excess of $1 million. It makes acquisition streamlining a standard

feature of contracts for all system acquisition programs and establishes an environment in which tradeoffs are desired, requirements and specifications are tailored and applied in a timely way in various phases of the acquisition process, and streamlining is applied not only in prime contracts but in subcontracts as well.

The SOW in a contract, as noted in the clause, must include a provision that establishes specific procedures for acquisition streamlining and provides explicit guidelines for the application of specifications, standards, and related documents, as shown in Figure 2-2.

ACQUISITION STREAMLINING SOW PROVISIONS

A. Procedure.

1. The contractor shall, as part of this contract, provide recommendations for the application and tailoring of requirements for contractual application in subsequent phases.

2. Specifications, standards, and related documents shall be reviewed for application; those found pertinent and cost-effective shall then be tailored and recommended for application in the next phase (including reprocurement) of this acquisition (see paragraph (B ) below)

3. This review shall also include the schedule, statement of work, data requirements, management systems requirements, and contract terms and conditions. These recommendations may be marked as source-selection sensitive if appropriate. The Government may accept, modify, or reject them.

4. Contractor recommendations shall be formatted and submitted as identified in the contract data requirements list (CDRL) using an approved data item description

B. Guidelines for Application of Specifications, Standards, and Related Documents

Alternate I Prior to the (full scale development) phase, all specifications, standards, and related documents cited in Section(s) _____ of this contract are for guidance only, except for minimum performance requirements and those documents specifically designated as mandatory.

Alternate II For the (full scale development) phase, all specifications, standards, and related documents cited in Section(s) _____ of this contract and specified portions of documents directly referenced therein (first tier references) are mandatory. All other referenced documents (second tier and below) shall be for guidance only unless specifically identified as mandatory.

Alternate III For the (production) phase, all of the specifications, standards, and related documents cited in Section(s) _____ of this contract to the tier identified as the baseline for production shall be mandatory

Notwithstanding the above indicated requirements for application, all specifications, standards, and related documents that define the product baseline for items already developed, such as standard parts and off-the-shelf items, are mandatory, irrespective of acquisition phase

**FIG. 2-2. STATEMENT OF WORK PROVISION KEY ELEMENTS**

## Tailoring Examples

Many programs provide good examples of the successful tailoring of specifications and standards. We have selected two such programs as examples. The first, the Air Force C-17 program is now in FSD; it began tailoring specifications and standards at the onset of development and has continued tailoring throughout its development. The second, the Navy T-45 program, is also in FSD, and it succeeded in tailoring specifications and standards for FSD.

### *C-17 Program*

Specification tailoring was begun early in the C-17 program since previous program experience indicated that inappropriate application of military specifications and standards would be costly and might limit possible design solutions. However, the first draft RFP still included thousands of specifications that were directly referenced or required by tiering. The Program Office took a three-part approach to tailor the specifications and reduce them to a manageable number. First, it conducted cost-performance tradeoffs to identify those requirements that increased the cost, reviewed those requirements with the user, and modified them when possible to decrease cost. That procedure was repeated to limit the number and scope of performance-related specifications. Second, a "zero-based" specification approach was employed. All specifications were justified to the program manager, and entire lists of specifications were eliminated. Finally, outside experts reviewed the proposed specifications to ensure that no important requirement had been inadvertently removed. The C-17 system specification now includes 102 references at all tiers (39 specifications, 30 standards, 33 other references). For example, subsystem requirements, such as those for landing gear, are directly incorporated into a single air vehicle performance specification.

### *T-45 Program*

The T-45 program reduced its original estimated development cost from $810 million to $438 million (in FY84 dollars). The decision to authorize FSD in late 1983 included a $450 million cost cap and required the use of a firm-fixed-price (FFP) contract in lieu of a cost-plus-incentive-fee contract. The cost cap and the use of an FFP contract required an intensive cooperative Government-contractor streamlining effort to restructure the program. The restructured program called for the T-45 design to be based on a derivative of an available aircraft design. The restructuring was done by a Government "Tiger Team" working with the prime contractor to modify the SOWs, specifications, contract data requirements, and terms and conditions by relating them to specific work breakdown structure elements. Because the T-45A is a derivative design and since prior applicable flight tests had already been completed on the original aircraft, the restructured contract reduced the number of ground test aircraft from 3 to 2, flight test aircraft from 4 to 2, contractor flight test hours from 623 to 411, data items from 530 to 251 (142 are in contractor format), and specifications from 322 to 281; simplified the engine design;

and simplified the training package. Even with those changes the program remained in the low-to-medium risk category. The breakdown of the resulting 281 specifications and standards is shown in Table 2-5; for comparison, an estimated

**TABLE 2-5**

**T-45 SPECIFICATION APPLICABLE DOCUMENTS BREAKDOWN**

| Document | Quantity |
|---|---|
| *DoD* | |
| Federal specifications | 8 |
| Military specifications | 145 |
| Federal standards | 1 |
| Military standards | 37 |
| Military standards drawings (MS) | 28 |
| Military handbooks | 6 |
| Military bulletins | 2 |
| Air Force-Navy aeronautical standards (AN) | 1 |
| Air Force-Navy design standard drawings (AND) | 1 |
| Air Standard Coordinating Committee (ASCC) | 1 |
| Naval Air Systems Command (NAVAIR) and Office of the Chief of Naval Operations (OPNAV) documents | 20 |
| NATO standardization agreements (STANAGS) | 3 |
| International Standardization Office (ISO) | 1 |
| *Other Government documents* | |
| Federal Aviation Administration (FAA) | 1 |
| *Industry standards* | |
| National Aerospace Standard drawing (NAS) | 16 |
| American Society for Testing and Materials (ASTM) | 1 |
| Aerospace materials specifications (AMS) | 5 |
| Radio Technical Commission for Aeronautics (RTCA) | 3 |
| Other | 1 |
| Total specifications and standards | 281 |

6,000 specifications and standards are included in a typical aircraft development program for a newly developed aircraft.

## AVAILABLE TAILORING TOOLS

Three types of tailoring tools are available – guide specifications (such as the Air Force's MIL-PRIME specifications) that call for tailoring parametric values embodied in specifications, automated specification tailoring tools that make tailoring more effective and efficient, and specifications that encourage using commercial products.

### Guide Specifications

Guide specifications are documents prepared specifically to support acquisition. They generically describe essential technical requirements and require decisions to be made and blanks to be filled in prior to solicitation or contractor selection.

The DSB in its report *Use of Commercial Components in Military Equipment* observed that many specifications include details that preclude consideration of commercial alternatives and limit the program manager's ability to make trade-offs [2-1]. The DSB recommended greater use of guide specifications, which are in use by the Air Force today in its MIL-PRIME program. These fill-in-the-blanks type specifications provide maximum tailoring flexibility because detailed technical decisions are not finalized until the time of the solicitation. This allows the program manager the flexibility to tailor specification values towards an existing commercial item that meets requirements.

The MIL-PRIME specifications are in use at Aeronautical Systems Division. They are the 50 or so of the 4,000 development specifications contained in the DoDISS primarily used in developing aeronautical subsystems. Basically, a MIL-PRIME specification:

- States requirements in operational performance terms
- Provides general criteria
- Provides specific parameters (but omits values and thus forces tailoring)
- Provides, in an appendix, guidance on how to calculate values (fill in blanks) and lessons learned from prior experience.

A recent tabulation of the status of MIL-PRIME specifications is shown in Table 2-6. Pending review, nearly 40 MIL-PRIME specifications should be available

in the near future. Aeronautical Systems Division indicates that the MIL-PRIME specifications eliminate overspecification by limiting tiering, allow innovative design solutions, provide guidelines based on past experience, and produce simplified product specifications.

**TABLE 2-6**

**STATUS OF MIL-PRIME DOCUMENTS**

| Completed | In review | In work |
|---|---|---|
| Landing gear systems | Computational systems | Radios |
| Bearings, cable, pulleys | Navigational systems | Defensive avionics systems |
| Environmental systems | Avionics integrity | Survival and floatation equipment |
| Fuel systems | Lightning protection | Emergency escape |
| Reliability | Offensive avionics systems | Lighting equipment |
| Parachute systems | Air transportability | Fasteners |
| Environmental integration | Aircraft oxygen systems | Engines, aircraft |
| Aircrew stations/passenger accommodations | Personal protective equipment | Human engineering |
| Aerial refueling systems | Support equipment | Human computer interface |
| Fire and protection systems | Maintenance training equipment | Refueling equipment |
| Lightning qualification test | Flight simulators | Flying qualities |
| Mobility | Aircraft structure | Flight controls |
| Pneumatics | Flight auxiliary power | Mission effectiveness |
| Displays | Hydraulics | Engines, ramjet |
| Instruments | Door and canopy mechanical systems | Air vehicle flight performance |
| Air data | Sound levels | |
| Avionics multiplexing | Engine installation | |
| Electrical power | | |
| Engine structural integrity | | |
| Display symbology | | |
| Propellant components | | |

The Air Force's Advanced Tactical Fighter (ATF) program has incorporated 44 MIL-PRIME specifications in its SOW for the current demonstration and

validation phase. For example, ATF wheel brake capacity requirements (stopping performance characteristics, number of operational landings, means for determining brake wear, and structural failure conditions) are described in a single specification with one appendix referring to two other specifications. Previously, 13 separate landing gear specifications were used with 256 related references. MIL-PRIME specifications are being used by the ATF program manager to "tailor-in" requirements that specify what is needed (in numerical terms) and "tailor-out" those that tell the contractor how to build it. Figure 2-3 illustrates the MIL-PRIME format for wheel brake capacity.

MIL-PRIME specification format for brakes

A. Brake assemblies used to provide any portion of the air vehicle stopping performance specified in 3.2.3.1A shall have the following characteristics: *(smooth torque) (etc.)*.

B. Brake assembly heat sink members shall be capable of producing *(number)* operational landings and the brake structural members shall be capable of producing *(number)* operational landings without failure or wear beyond limits. The spectrum of operational landings is defined as: *(weights) (speeds)*.

C. Means shall be provided to determine current status of brake wear without disassembly or the use of special tools.

D. Structural failure of the brake heat sink shall not result in *(fire) (lock-up) (etc.)*.

**FIG. 2-3. TYPICAL MIL-PRIME SPECIFICATION**

## Automated Tailoring Tools

Modern information management techniques can assist in the development of a tailored system specification or an RFP. These techniques can be applied to the complete technical package: SOW, CDRL, military specifications (MILSPECs) and military standards (MILSTDs), and data item descriptions (DIDs). By using a menu and responding to a series of prompting questions, contract and technical specialists can select specific paragraphs from each tasking document, tailor them to meet the system specification, and update them on the basis of design and development experience.

The Air Force has developed two specific automated document preparation systems. The Computer Generated Acquisition Documents System (CGADS) was developed at the Electronics Systems Division to prepare contract packages. With CGADS, documents are prepared by answering *yes, no, or undecided* to simple

questions prepared by staff specialists. (Some user assistance is built in.) It generates a unique set of task and data requirements to create an SOW text and specify CDRL entries. DIDs are automatically identified, and references to MILSTDs and MILSPECs are cited consistent with standard SOW tasks. A hard copy of the document can be printed out or the file can be downloaded to remote work stations for subsequent editing and distribution.

The other Air Force automated document preparation system, Technical and Managerial Support Environment (TEMSE)/Docwriter, was developed by the Space Division to structure the program technical package. This system provides both requirements and specification management and a document preparation capability. It provides standard outlines for system specifications and SOWs; prepares other structured documents such as test plans, verification and traceability matrices, and management summary reports; and maintains an audit trail of specification tailoring. It helps manage requirements by storing the requirement text and analyzing its content. It also offers detailed interpretation and guidance on tailoring MILSPECs and MILSTDs. Currently about 50 MILSPECs are incorporated into the system. The system can be used to refine the output of CGADS by suggesting further tailoring of tasks and data requirements.

The Naval Air Engineering Center has developed the Automated Specifications and Standards Information System (ASSIST) to provide information and visibility on specifications, standards, and other standardization documents and to improve their currency, accuracy, and management. The ASSIST database includes 33,000 military and other Government specifications, standards, bulletins, and handbooks with their primary references and another 10,000 without their references. ASSIST can be used by program managers, engineers, and acquisition managers to limit specification tiering by creating automated reports on specification trees, specification reference lists, and keyword indexes and by identifying overage and canceled documents. Access to the system is currently limited.

### Commercial Product Specifications

Recent studies of the Packard Commission, the DSB on Use of Commercial Components, and legislation requiring a preference for using NDI all call for placing greater emphasis on buying commercial products. One way of doing so is to use more

commercially suited acquisition documents, such as non-Government standards and commercial item descriptions (CIDs) to replace MILSPECs. Over the past 5 years, the number of non-Government standards adopted for DoD use has increased by 35 percent to more than 4,000 while the number of MILSPECs has remained static. Where non-Government standards do not exist, efforts are under way to work with appropriate organizations to help develop them or to develop CIDs or performance-oriented MILSPECs such as MIL-PRIME. Selective Federal supply classes that cover commercial products are being reviewed to establish a timetable for their replacement by non-Government standards or CIDs. Commercial database tools are now available for using technical characteristics to search the Federal Supply Catalog or for using those characteristics to search a limited number of commercial databases.

## RECOMMENDATIONS

In order to use specifications and standards properly, we recommend that the Military Departments develop automated tools or enhance existing ones to accelerate specification tailoring.

An example of such a tool is the Air Force's MIL-PRIME guide specifications that soon will cover some 40 specification areas (e.g., landing gear systems, reliability, etc.) We encourage greater coverage of guide specifications in aerospace and other applications. We also urge greater user access to the Navy's ASSIST system to limit specification tiering. We also recommend that OSD place more emphasis on identifying obsolete, troublesome specifications and standards to resolve associated problems more rapidly. OSD should also increase its efforts to identify MILSPECs that can be cost-effectively replaced by non-Government standards, CIDs, or guide specifications.

# CHAPTER 3

# ESTABLISHING PRACTICAL PERFORMANCE REQUIREMENTS

Clearly, cost and performance must be balanced when defining requirements, especially when making decisions early in the acquisition cycle. Institutional and operational changes to facilitate such balance have been proposed by the Packard Commission and DSB and have been reaffirmed in recent studies by the RAND Corporation and the Center for Strategic and International Studies. Those proposed changes all involve the development of more clear-cut tradeoffs that consider the needs of the operational user. Many desirable changes are already being made; they include initiatives to improve the requirements process in the Services; creation of the positions of Under Secretary of Defense (Acquisition) [USD(A)] and Vice Chairman of the Joint Chiefs of Staff, who would jointly examine weapon systems requirements; and development of new acquisition policy and procedures for overseeing acquisition decisionmaking. Further changes should be based on and incorporate those changes already under way.

## BASIS FOR IMPROVING THE DEVELOPMENT OF REQUIREMENTS

### Packard Commission Recommendations on Balancing Cost and Performance

The Packard Commission recommended the establishment of an Under Secretary of Defense (Acquisition) and a Vice Chairman of the Joint Chiefs of Staff, who would jointly define weapons requirements, select programs for development, and provide an early tradeoff between cost and performance [1-2].

The Commission pointed out that problems begin with requirements definition where users "pull" requirements (i.e., include features that are desirable but whose cost exceeds their real value) without understanding the likely impact of their requirements on the cost, schedule, and supportability of the weapons they eventually receive. Alternatively, technologists often push for requirements that will exploit new technology. In both cases, necessary tradeoffs to eliminate "gold plating" occur only much later in the program after many decisions have already been made. The Commission noted that tradeoffs between user requirements on one hand and schedule and cost on the other are fundamental to program success and

that such tradeoffs be evaluated as a program progresses toward the FSD milestone decision.

The Packard Commission also noted the difficulty in formulating system specifications that balance cost and real advances in military capability but avoid gold plating. This difficulty arises from a need to blend the diverse perspectives of the acquisition team (which does not have sufficient experience for insightful approaches to operational problems) and the users (who have inadequate technical knowledge and program experience) to achieve such balance. In particular, little success has been evident in stimulating the use of NDI as an alternative to developing unique military products.

The Commission recommended that these tradeoffs be the basis for FSD, a decision to be made by the USD(A) and the Vice Chairman of the Joint Chiefs of Staff. That decision should consider two aspects: affordability and "make-or-buy." The affordability decision requires subjective judgment on the value of military capability. If a new weapon system can be developed and produced at the target cost, it may be authorized for development; otherwise, ways should be sought to extend the life of the existing system. Make-or-buy decisions require an assessment of the need for a development program and whether it is possible to buy or adapt an existing commercial or military system (i.e., use NDI).

### DSB Recommendations

The results of the DSB study on Practical Functional Performance Requirements were an important input to the Packard Commission recommendations discussed above [1-3]. The DSB recommended that the generation of operational requirements be an iterative process during which potential solutions to the operational need are evaluated and traded off with respect to affordability, schedule, performance, and risk prior to commitment to the program and that cost/capability tradeoffs continue during development. The DSB also recommended that users become more involved in the requirements definition process. Those recommendations should be considered along with the results of an earlier DSB study on the acquisition cycle that confirmed the perception that the time required between program initiation and the beginning of FSD – the principal time for conducting these tradeoffs and iterating detailed requirements – has been getting longer in recent decades [3-1].

Fundamentally, the user and the program manager must interact. The program manager must understand the user's needs fully so that he can determine which elements of system performance are critical to mission accomplishment and which can be backed off. The user, on the other hand, must understand that there are tradeoffs on what actually might be achievable and that he may have to accept compromises in one aspect of performance in order to achieve an overall measure of mission capability.

### Other Observations on Improving Requirements

RAND recommends improving the acquisition process through an integrated strategy of reforms, with the first step being improving the process of formulating requirements for needed operational capabilities [3-2]. It recommends a strong, central focus to exploit and integrate the unique capabilities of each Service, eliminate unnecessary and undesirable duplication, and assure that standard analytic approaches are used in assessing enemy threat. In addition, RAND calls for continuing and intensifying cross-Service mission area planning and efforts to develop and demonstrate improved mission area analysis techniques, and for elevating the role of the users – major operational commanders – in the requirements formulation process. Additionally, it recommends attention be given to upgrading current systems to achieve force modernization and the need for planning that addresses not only the specific weapon system but entire categories of equipment [3-3]. In particular, RAND stresses the need for developing a concept of operation within which system performance requirements are generated and traded off.

A study by the Center for Strategic and International Studies also recommends improving the requirements and planning process [3-4]. It points to the need for a more collective focus by OSD and the Joint Chiefs of Staff to coordinate and reconcile operational concepts and use them as a basis for program-oriented decisions. The study also notes the difficulty in integrating the technical and operational points of view in developing requirements that are not gold plated. It estimates that eliminating excess requirements is the single greatest area of potential dollar savings; at least 5 percent of the acquisition budget can be saved, and that amounts to $10 – 15 billion annually.

## AIR FORCE INITIATIVES

The Air Force has established a new performance requirements process to respond to Packard Commission recommendations to simplify requirements definition. The approach, defined in Air Force Regulation (AFR) 57-1, *Operational Needs, Requirements, and Concepts*, is directed at developing a short statement of military need, promoting tradeoffs, and reducing the time (to 6 months) it takes to identify requirements. The process also calls for upgrading existing systems as at least one option to be considered during the concept exploration phase.

### Air Force Requirements Process

The current processing time [from receipt of the original draft of the statement of need (SON) to validation] in the Air Force is 16 months – a period that is far too long. The Air Force faces other problems as well as time. Initial requirements have been too system-specific and too solution-oriented and have offered too few alternatives (especially in terms of comparing system upgrades with new systems and of examining affordability versus capability).

The AFR 57-1 approach includes the following key elements:

- The SON focuses on the basic military need rather than on a detailed solution to meet the need.
- The major using command validates the SON except for those SONs that fall into a "special interest" category (e.g., joint Service, multiple user interest).
- Air Force headquarters reviews requirements prior to the demonstration and validation phase (Milestone I) but after initial concept exploration.
- A requirements correlation matrix (RCM) is established to provide a clear audit trail linking requirements with specifications and test criteria.
- Requirements are updated at major milestones as more detailed requirements are clarified over time and operational and support concepts are developed.

### Evolving and Managing Requirements

The SON, when updated with more detailed requirements contained in the operational and support concepts developed during the concept exploration phase, evolves into a Systems Operational Requirements Document (SORD). Developing

the SORD will require more user involvement to refine the requirement and incorporate the results of tradeoffs in the preceding acquisition phase.

The SON describes each need in operational terms, documents official validation of the need, and furnishes preliminary requirements for participating organizations. The SORD is the requirements and planning document prepared to address all major operational and support needs. SORDs are updated prior to major milestones with additional qualitative and quantitative data relating to performance requirements and support parameters based on previous tradeoff studies and analyses.

The RCM is a multicolumn spreadsheet whose primary purpose is to document and track formulation of, and changes to, user requirements as they evolve by acquisition phase. The RCM documents the results of cost/performance tradeoffs in each phase and provides for easy comparison and correlation of requirements not only to specifications and test criteria but also to corresponding contract dollar values as well. Table 3-1 is the format for an RCM.

**TABLE 3-1**

**SYSTEM X REQUIREMENTS CORRELATION MATRIX**

| Parameter | Requirements | | | Specifications | | | Test criteria | | |
|---|---|---|---|---|---|---|---|---|---|
| | SON Jan 90 | SORD I Jun 91 | SORD II Jun 93 | Jan 90 | Jun 91 | Jun 93 | Jan 90 | Jun 91 | Jun 93 |
| 1. Sustained cruise (M) | 1.7 (g) | 1.6 (r) | 1.6 (r) | TBD | 1.6 | 1.6 | TBD | 1.6 | 1.6 |
| 2. Level acceleration ($ft/sec^2$) | 30 (g) | 40 (g) | 40 (r) | TBD | 45 | 40 | TBD | 40 | 40 |
| 3. Dash speed (M) | 2.3 (g) | 2.2 (g) | 2.1 (r) | TBD | 2.3 | 2.1 | TBD | 2.2 | 2.1 |
| 4. Tactical mobility [(w/o) air refuel] | Intercontinental (g) | 1,500 nmi (r) | 1,500 nmi (r) | TBD | 1,500 | 1,500 | TBD | 1,500 | 1,500 |
| 5. Support mobility (C-141 loads) | 60% < F-16 (g) | 50% < F-16 (g) | 10 (r) | TBD | 9 | 10 | TBD | TBD | 10 |
| 6. Weapon system reliability | > F-16 (g) | 98% (g) | 95% (r) | TBD | 99% | 96% | TBD | 98% | 95% |
| • | • | • | • | • | • | • | • | • | • |
| 28. System availability | 90% (g) | 85% (r) | 85% (r) | TBD | 86% | 86% | TBD | 85% | 85% |
| 29. Maintainability (MTBMA/fly hrs) | > F-16 (g) | 5 (g) | 6 (r) | TBD | 5 | 6 | TBD | 5% | 6 |
| 30. Fire-and-forget capability | Yes (r) | Yes (r) | Yes (r) | TBD | Yes | Yes | TBD | TBD | TBD |

*Note:* (g) = goal, (r) = requirement, M = Mach number, MTBMA = meantime between maintenance action

*Source:* Air Force Regulation 57-1, *Operational Needs, Requirements, and Concepts*, 1987

## Planning for Product Improvement

The Air Force performance requirements process also encourages more consideration of upgrading existing systems. According to the Air Force briefing on the requirements process, this process encourages designing in "upgrade-ability" through standard interfaces and the use of form, fit, and function planning [3-5]. Table 3-2 shows examples of where system upgrades have already occurred.

**TABLE 3-2**

**SELECTED AIR FORCE UPGRADES**

| System | Upgrade |
|---|---|
| F-4 | Avionics, engine signature |
| A-10 | Navigation, communications, AIM-9, LANTIRN |
| F-15 | AMRAAM, communications, range, payload |
| F-16 | Sensors, navigation, AMRAAM |
| F-111 | Armament, avionics, modernization |
| A-7 | Armament, avionics, chaff/flares |
| AIM-7 | Range, clutter rejection, ECCM (electronic counter-countermeasures) |
| B-52 | Air-launched Cruise Missile/Advanced Cruise Missile, HARPOON, defensive systems |

More important than the savings in development time, consideration of system upgrades can offer some significant cost-performance benefits. As shown in Table 3-3, the cost and time of providing improved strategic refueling capability and strategic airlift on a 20-year life-cycle-cost basis can be significantly reduced [3-5].

In the case of providing additional strategic refueling in support of executing the Single Integrated Operational Plan (SIOP), an upgraded re-engined KC-135 (KC-135R) tanker aircraft would provide 1.5 times the capability of the baseline performance provided by the KC-135A at a 20-year life-cycle cost of almost $70 million, while a new KC-10 tanker aircraft would provide only 2.5 times the capability for about $140 million (about twice the cost of the upgrade option).

In the case of strategic airlift, the C-141 (the C-141B) could be upgraded for about $1.5 million per unit, providing capability equivalent to a C-5A for almost the

TABLE 3-3

AIR FORCE COST-PERFORMANCE TRADEOFFS: TWO EXAMPLES

| Options | Strategic refueling (SIOP support) | | | | Strategic airlift | | |
|---|---|---|---|---|---|---|---|
| | Upgrades | | | New | Upgrades | New | |
| | KC-135A | KC-135E | KC-135R | KC-10 | C-141B stretch | C-141A | C-5A |
| Unit cost | $1.1 M | $4.8 M | $18.0 M | $67.0 M | $1.5 M | $27 M | $92 M |
| Availability | 3 mo | 6 mo | 2 yr | 2 yr | 1979 | 1982 | 1983 |
| Capability | Baseline (1.0) | 1.2 | 1.5 | 2.5 | 1.3 | Baseline (1.0) | 3.5 |
| 20-year LCC | $58.6 M | $58.8 M | $68.5 M | $138.4 M | $102 M | $127 M | $252 M |

*Source:* Air Force Briefing on the Requirements Process, 1986.

same amount based on life-cycle cost. In comparison with purchasing more C141-As, the upgraded C-141B would cost significantly less in terms of 20-year life-cycle costs.

## ARMY INITIATIVES

The Army approach to streamlining performance requirements has focused on user requirements, contract requirements (including technical requirements that describe the system being acquired through specifications), and testing requirements. We focus on the user requirements, where the Army's key to streamlining is to involve an organization chartered to specifically represent the operational user in the acquisition. That organization is the Training and Doctrine Command (TRADOC).

### TRADOC Role

TRADOC has the principal Army responsibility for defining user requirements. Through continuing mission area analysis, TRADOC first establishes priorities for each battlefield deficiency. Next, it determines whether the deficiency can be met with a nonmateriel solution. If changes in doctrine, tactics, or training can produce the desired results with existing equipment, all costs for developing, producing, fielding, and supporting new equipment are avoided, and the Army realizes the ultimate in acquisition streamlining. When TRADOC determines that

the deficiency can only be solved with a materiel solution, it initiates a concept formulation process whose output is a materiel requirements document defining the user's need. That document is finalized in concert with the materiel developer and becomes the "contract" between TRADOC and, in most cases, the AMC.

### Tradeoff Analyses

During concept formulation, TRADOC continues extensive tradeoff analyses and subjects each performance requirement to a thorough review designed to ensure streamlining. While TRADOC clearly strives to include every possible aspect of the user requirement, it examines each requirement in terms of added capability. It also examines each feature in terms of realism, essentiality, and value added within budget constraints. A number of basic questions are examined. Is this requirement essential to satisfying the battlefield deficiency? Is the marginal cost affordable? Will this requirement add more warfighting capability than other reasonable alternatives? (For example, fewer, more-accurate missiles or more, less-accurate ones.) This process of maximizing the total force rather than optimizing individual systems is the thrust of TRADOC's effort. In parallel, the concept formulation process continually seeks technological opportunities that, if exploited, provide significant "leap-ahead" capability on the battlefield.

### Other Army Initiatives

TRADOC has several other initiatives underway to improve its performance requirements documents. Those documents now focus on performance-oriented requirements, citing key operational characteristics and the capability needed now versus that needed later. Operational characteristics are stated in bands of performance. Requirements stated in these terms include provisions for future system growth, technology insertion, and other planned product improvements. Draft requirements documents are provided to industry to solicit feedback and early involvement. The streamlining and simplification of the requirements process should make it possible to go from program initiation to approval of the required operational capability in no more than 24 months compared with the current experience, which can be as long as 7 years.

To provide additional discipline in requirements streamlining, a multitiered, constructive challenge process has been developed to question all aspects of requirements. As an adjunct to the TRADOC effort, AMC has put procedures in place to

challenge the user requirement. While AMC is responsible for developing and producing materiel to satisfy user defined requirements, its personnel are often able to estimate the technical, schedule, and cost impact of performance requirements. Thus, AMC can advise TRADOC of instances in which requirements appear to add relatively little performance while significantly increasing the product cost.

## NAVY INITIATIVES

Navy streamlining has most heavily emphasized improvements in the use of specifications. However, it is emphasizing tradeoffs by modifying basic acquisition procedures during program development. The most interesting example to date is the decision by the Navy to satisfy the need to replace Maritime Patrol Aircraft assets in the early 1990s with either commercial aircraft or a derivative of an existing military aircraft. Performance requirements will be refined based on the results of operations analysis and contractor responses to a draft RFP [3-6].

## REQUIREMENTS DEFINITION EXAMPLES

### Advanced Anti-Tank Weapon System – Medium Program

The Army has been able to establish specifications for its Advanced Anti-Tank Weapon System – Medium (AAWS – M) based only on pertinent minimum essential user requirements. In that program, the environmental requirements for operating altitude, exposure to rain, water immersion, icing, and nuclear survivability were initially overstated in terms of operational conditions likely to be encountered. These requirements were revised to include only the specific requirements from the initial draft statement of required operational capability, drawing from actual experience of systems already in the field such as the TOW and DRAGON missiles and soliciting advice from technical experts in nuclear survivability. Performance requirements as originally defined by the user were reviewed and challenged, first in internal Army staff reviews and then again by Army acquisition executives following industry input.

### Experimental Light Helicopter Program

The Army employed a major new technique to encourage tradeoffs in developing specific system requirements for the LHX acquisition. The preliminary system specification was given in banded ranges to encourage each offeror to make tradeoffs among performance characteristics for design optimization. Initially, the

only fixed requirements dealt with delivery schedules, reliability, and goals for competition. Additionally, following the recommendation of the DSB study on LHX requirements, additional major tradeoffs are under consideration: one pilot versus two pilots, conventional helicopters versus other approaches such as tilt rotor, etc. [3-7].

### C-17 Program

The Air Force's C-17 program office has used performance-oriented requirements as the basis for its acquisition strategy, specification tailoring, and contracting approach. Performance-oriented requirements that reflect planned employment, maintenance, and support concepts were specified, ensuring that the user, developer, contractor, and support organization all understood the concepts. Because forecasting technology growth is difficult, requirements were stated in terms of thresholds and goals to control costs while striving for optimum requirements. The contract, which covers FSD and options for production, incorporates a strong warranty whose key requirements will be tested during an operational readiness evaluation. The contract fixes all requirements for reliability, maintainability, and availability at the system level. Provided total system requirements are met, the contractor can allocate those requirements to various subsystems and components as he sees fit. If the C-17 fails to meet any single threshold, the contractor will lose half of the total incentive fee and will still have to meet the reliability, maintainability, and availability threshold under terms of the warranty as shown in Table 3-4.

### Advanced Tactical Fighter Program

The ATF program involved tradeoffs by contractors from the beginning of the program. They critically examined the sensitivities of performance requirements (e.g., survivability, reliability, maintainability, and operability) to each design specification. The program, currently in the demonstration and validation phase, has two separate contractor teams developing prototypes to examine wide-ranging tradeoffs in nearly a dozen areas. Table 3-5 displays major tradeoff areas. These analyses will also consider results of more than 30 separate mission analyses and technology assessments.

TABLE 3-4

C-17 WARRANTY ON SELECTED ITEMS

| Requirement[a] | Warranty period | Remedy |
|---|---|---|
| The contractor must meet or exceed system specifications or growth requirements for the fleet's reliability, maintainability, and availability parameters . . . | . . . for 180 days after initial operational capability has been reached . . . | . . . or the contractor must effect repair, rework, replace, or redesign |
| Each aircraft and its structures, subsystems, spares, support equipment, and software must be free from defect in design, materials, and workmanship . . . | . . for 180 days after delivery of the last aircraft for all items except the structure (each structure is warranted for 45,000 hours of use) . . . | |
| Design information must be free from defect . . . | . . . for 180 days from delivery of the data. . . | . . . or the contractor must correct defects and repair any subsystem damage which resulted from use of the data. |
| The installation of component items must conform with system specifications and not invalidate any of the above warranty provisions . . . | | . . . or the contractor must reinstall the item so that warranties are no longer invalidated. |

[a] If any system-level requirements specified in the contract are not met, the contractor must take corrective action at no cost to the Government. The contractor also loses half of the incentive payments that would have been earned for each of the other reliability, maintainability, and availability parameters.

## OSD INITIATIVES

As noted by the Packard Commission, DoD has not provided any mechanisms to challenge requirements, especially at the OSD level, where operational users were only informally members of the milestone review body, the Defense System Acquisition Review Council (DSARC). Following the Commission's recommendation, a Joint Requirements and Management Board was established to replace the DSARC and involve the user through participation of the Joint Chiefs of Staff. More recently, the Defense Acquisition Board (DAB) has been established under the charter of the Defense Acquisition Executive (DAE), the USD(A), and has been implemented through new acquisition policy directives – DoD Directive (DoDD) 5000.1, *Major and Non-Major Defense Acquisition Programs*; DoD Instruction (DoDI) 5000.2, *Defense Acquisition Program Procedures*; and

TABLE 3-5

PRE-FULL-SCALE DEVELOPMENT ADVANCED TACTICAL FIGHTER TRADEOFF ANALYSES

| Area of tradeoff | Variables |
|---|---|
| Armament | Loadout, weapon mix |
| Observables | Radar cross section, infrared signature, other signature measures |
| Performance | Range, speed, structural limits |
| Avionics | Offensive avionics, defensive avionics, communications/navigation/identification, architecture, software, sensors |
| Propulsion | Size, cycle |
| Airframe | Subsystems, structures |

DoDD 5000.49, *Defense Acquisition Board.* Detailed procedures and guidelines for operation of the DAB continue to evolve as discussed below.

- It is the senior DoD acquisition review board assisting the USD(A) in the role of DAE by providing milestone and program reviews, policy formulation, and acquisition resource recommendations. It is the primary forum to be used by the DoD Components to resolve issues, provide and obtain guidance, and make recommendations to DAE on matters related to the DoD acquisition system.

- It is supported by 10 acquisition committees that assist in program review and policy formulation. Those committees hold pre-DAB meetings to provide advice, assistance, and recommendations to the DAB and to reach consensus on acquisition issues. The 10 committees are: Science and Technology; Nuclear Weapons; Strategic Systems; Conventional Systems; Command, Control, Communications, and Intelligence; Test and Evaluation; Production and Logistics; Installation Support and Military Construction; International Programs; and Policy and Initiatives.

- Its chairman is the USD(A) and its vice chairman is the Vice Chairman of the Joint Chiefs of Staff. Members are the Service Acquisition Executives of the Military Departments; the Assistant Secretaries of Defense (Comptroller, Production and Logistics, and Program Operations); Directors of Defense Research and Engineering and Program Analysis and Evaluation; and chairmen of the DAB acquisition committees (as appropriate).

Procedures addressing the concept demonstration/validation milestone (Milestone I) decision are especially concerned with requirements development. According to DoDI 5000.2, primary considerations during this decision include program alternatives tradeoffs and performance/cost and schedule tradeoffs (including the need for a new development program versus buying or adapting existing military or commercial systems). Other considerations are prototyping, affordability and life-cycle costs, common-use solutions, cooperative development, and other aspects of acquisition strategy.

## RECOMMENDATIONS

Based on the experience of the Services to date in improving their requirements process, we recommend continuing the disciplined development of performance requirements early in the program. Such an approach should seek to identify tradeoffs that balance cost, schedule, and performance and encourage a close and cooperative working relationship between the program manager and the user. There should be more participation by both OSD and the Joint Chiefs of Staff in examining these tradeoffs.

Specifically, we recommend the creation of a DoD Requirements Working Group to enhance the requirements process and improve tradeoff methodologies. The working group should be convened by the OSD focal point for acquisition streamlining and should consist of Service representatives designated by the Service streamlining advocate, a representative from the Joint Chiefs of Staff, and other representatives from the OSD staff concerned with the requirements process. The working group should consider standardizing requirements terminology, recommend examples and methods of exemplary cost-performance tradeoffs, and decide whether further guidance (e.g., a DoDI) is required to improve the requirements process. Recommendations from the working group should be considered by the streamlining advocates for their action; additional recommendations that may require additional decisions should be presented to the Policy and Initiatives Committee of DAB.

# CHAPTER 4

# STRIVING FOR BEST VALUE IN SOURCE SELECTION

In the previous chapter, we described the potential benefits that can be realized by streamlining performance requirements. Further benefits can be anticipated by improving the source-selection process and one means to do so is to use the concept of best-value source selection. That concept bases source selection on the qualified bidder whose proposal represents, in the view of the program manager, the overall best value to the Government rather than merely the lowest price. It is the process of awarding a contract for the best proposal received in terms of cost and performance, and that proposal may be neither the lowest in cost nor the best in technical approach. Best-value contracting introduces flexibility to the award process by early and clear definition of the objective to seek a contract satisfying the best mix of requirements at a reasonable cost; it is merely a focus on traditional commercial contracting practices.

## THE BEST-VALUE CONTRACTING APPROACH

A prudent individual compares the relative values involved in the choice between a satisfactory product at a reasonable price and a better (or a worse) product at a higher (or lower) price. Streamlining, with its emphasis on cost-performance tradeoffs, involves multiple-selection criteria.

Best-value contracting employs a performance specification rather than a detailed design specification, which encourages an examination of potential tradeoffs that can satisfy or exceed minimum performance requirements. Potential contractors must be clearly informed whether variations to the RFP are acceptable and how those variations will be evaluated and incorporated if they are found to be more advantageous to the Government. Source selection is based on an evaluation of the advantages, disadvantages, and riskiness of competing proposals and comparison of their relative value to their cost. Where the difference in value more than offsets the difference in cost, the Government can base its selection on best value rather than lowest cost.

In best-value contracting, offerors must be allowed to bid what they feel is their best-value system. Since best value is a subjective concept, it becomes a compromise between all the parties on the Government evaluation team. The best technical solution may not be the best operational solution, etc. The Government must agree on criteria for the best-value system before entering negotiations, and best-and-final proposals must be evaluated on how closely they meet those criteria.

## BEST VALUE AND THE ACQUISITION REGULATIONS

### Current Regulations

The FAR allows best-value source selection. Under the FAR guidelines on source selection (Subpart 15.6), the evaluation factors to be considered in evaluating contractor proposals in competitively negotiated acquisitions are discussed (FAR Section 15.605). The guidelines currently note that these factors and their relative importance are at the discretion of the acquisition officials; they also note that price or cost factors and quality are to be included in every source selection.

Further, the FAR makes the point that while the lowest price or lowest total cost is properly the deciding factor in many source selections, the Government may select the source whose proposal offers the *greatest value* to the Government in terms of performance and other factors. The examples cited in the FAR involve acquiring R&D or professional services or using cost-reimbursement contracts.

DoDD 4105.62, *Selection of Contractual Sources for Major Defense Systems*, also makes the point that the principal objective of source selection is to select contractors that can best meet the Government's need as described in the solicitation. It goes on to note that although cost is always a criterion, lowest proposed contract cost is not always the determining criterion in selecting sources for development. When cost is weighted, the specified relative importance is intended to guide offerors to include affordability considerations (including unit production and life-cycle costs) when making tradeoffs to achieve a balance between mission requirements and program constraints.

Further, when evaluating proposals, the Government must consider both goals (values that enable proposed systems to satisfy fully a mission need) and thresholds (values that describe a minimum level of operational effectiveness and suitability or a maximum expenditure of resources). The range between goals and thresholds is

appropriate for tradeoffs that are reflected in the offeror's proposal of the most cost-effective solution to the Government's mission need. Alternative goals and thresholds may also be appropriate where the program acquisition strategy includes solicitation of alternative proposals, especially where offerors are encouraged to pursue innovative concepts.

### Proposed Changes

Emphasis on best-value contracting must be increased and so must the awareness of the possibility of moving away from competition based only on lowest price. A reasonable approach is to use the solicitation packages to provide a clear indication of a preference for best value by reflecting that preference in the evaluation criteria to be used in proposal evaluation. Additionally, a clause can be included with the RFP that emphasizes the best-value approach. Such a clause might note:

> (a) Offerors must submit fully responsive proposals meeting minimum performance levels. Nevertheless, it is the objective of the Government to acquire systems with a proper balance among performance, cost, and schedule. The performance requirements for the system contained in this solicitation are based on the Government's best estimate of need, in terms of thresholds (minimum performance levels) and goals. Desired goals may be traded off on a single basis or in combination when structuring proposals. Offerors should structure proposals with a balance of all factors that will offer the Government best value; they are encouraged to challenge performance and schedule requirements, especially those desired goals that increase disproportionately the design, production, or support costs of the systems. Offers should be structured to provide "common-sense" tradeoffs to improve quality, enhance effectiveness, and reduce the time and cost of the system acquisition.
>
> (b) An integrated, balanced assessment of the overall value of the proposal will be accomplished in accordance with Section M of the solicitation.

## STRATEGY TO IMPLEMENT BEST VALUE IN DoD ACQUISITION PROGRAMS

To implement the best-value concept in source selection, it must be integrated with the effort to better define performance requirements. Tradeoff studies are required early in the program to establish cost-performance relationships, and those relationships must be reflected in both acquisition milestone decisions and specific contracting actions.

Best-value contracting should be used in programs requiring new development, in those that use NDI or commercially available equipment, or in acquisitions in which a new development is considered along with NDI. The flexibility lies in allowing a variety of proposals to come forward and then using judgment in selecting the best overall value. In the case of NDI alone, a best-value approach may be easier. Less-subjective judgment may be required because the items exist and there is more known about specific performance and prices. However, the same approach should be followed with new developments, both when the use of NDI is a viable alternative and when it is not, basing decisions on cost-performance tradeoffs and risk assessment. Performance requirements and any specifications should be incorporated in RFPs in a way that avoids premature application of design solutions.

## AN EXEMPLARY APPROACH TO BEST VALUE

The Army has incorporated the concept of best value into the source-selection process. Its approach is to offer more commercial-style acquisition, which allows balanced consideration of cost and performance and maximizes flexibility for both the contractor and Government in satisfying performance-oriented requirements. The Army views best-value source selection as a logical companion to performance-oriented requirements. Such selection, it finds, maximizes the flexibility for both contractor and Government personnel. An example of the Army approach to best-value contracting is the Mobile Subscriber Equipment (MSE) program.

MSE was planned as a nondevelopmental, best-value, production-procurement program based on available European-designed communication networks, terminals, access equipment, and system controls. No Government technical specifications were provided in the RFPs. The competing bidders were free to propose hardware systems and concepts for supply and maintenance. Several contractors proposed systems with different mixes of performance characteristics, such as area coverage, degree of fixed and mobile subscriber access, and terminal capabilities. Proposals were to include five firm-fixed-price (FFP) production options, FFP spares for the life of the program, and performance warranties. Bidding teams (European design contractors with U.S. production partners) submitted technical specifications based on available systems; those specifications were then modified during negotiation. The Army was able to avoid technical leveling and auctioneering in the

selection process and to negotiate for best value because the performance characteristics and prices of existing equipment were known with reasonable certainty.

## RECOMMENDATIONS

We recommend that the Military Departments increase their emphasis and awareness of best-value contracting and that contracting officers be encouraged to pursue contract awards that offer the best value. We also recommend that the Military Departments evaluate the use of nondevelopmental items and existing commercial products in source selections based upon factors other than price alone.

# CHAPTER 5

# CONSOLIDATING PROGRESS AND EXTENDING BENEFITS

Acquisition streamlining has established a solid foundation of accomplishments since the policy was issued in January 1986. However, additional areas now must be addressed to build upon that foundation. Successful contract administration streamlining approaches need to be disseminated throughout the DoD contracting community and better program oversight and training must be provided.

## CONTRACT ADMINISTRATION PROGRESS

### Streamlined Source-Selection Methods

Streamlining source selection can greatly reduce the time required to award contracts. The Air Force's Ballistic Missile Office has developed a streamlined source-selection approach that has reduced the average time to contract award to 101 days. The approach calls for fewer evaluation factors (not more than 10), proposals limited to 100 pages, 10-person maximum evaluation boards, and contractor oral presentations to the evaluation board. The Ballistic Missile Office indicates that it fully intends to shorten the source-selection schedule to 63 days.

### Streamlining Value Engineering

Value engineering is a process by which contractors examine products for engineering changes that will yield a net savings to the Government and then shares the savings with the Government. Determining a value-engineering change can be a complicated and lengthy process. To encourage value engineering as an integral part of contractor design and development, streamlined value-engineering clauses make its implementation easier for both the Government and the contractor. One approach, under consideration by the Air Force, calls for providing immediate compensation to the contractor on the current (instant) contract for the specific program in lieu of prospective savings on future contracts for all programs (as is the case in the standard value-engineering agreement). The new process requires simpler and more easily prepared documentation than the conventional value-

engineering proposal, a more rapid Government approval cycle, and payment to the contractor of 50 percent of the estimated savings on the instant contract at the time of determination.

### Award-Fee Contracting

A sample award-fee clause that specifies essential contract terms and conditions has been developed for acquisition streamlining. It should be used primarily in those noncompetitive and other programs for which the program manager wishes to offer an incentive to develop acquisition streamlining recommendations. The clause is included in Appendix C of the acquisition streamlining handbook (DoD HDBK 248B). It incorporates an award-fee contract plan by reference. The sample award-fee plan provides guidance on the purpose, evaluation areas, explanation of terms, and organization for administering award fees; describes evaluation procedures and the method for allocating available fee; and includes useful formats for implementing the plan.

## PROGRAM OVERSIGHT

Maintaining adequate oversight of progress in acquisition streamlining is essential to determine its benefits, take advantage of experience, determine where emphasis is needed and where progress is being made, and identify areas in which new initiatives are needed. To date, one systematic survey of streamlining results has been completed, three major conferences on acquisition streamlining have been held, a process for regular meetings of acquisition streamlining advocates from the Services has developed, and initial ideas for a database to disseminate streamlining information has been discussed.

An initial acquisition streamlining survey was conducted in 1986. A questionnaire was sent to the more than 30 pioneer streamlining program offices in each Military Department. Survey results on those programs provided data on time saved, best streamlining techniques, and dollar savings in those cases in which they were noted. The results provide a quantitative baseline against which to measure progress. Procedures reported included eliminating or tailoring specifications and standards, conducting tradeoffs between requirements and cost, obtaining reductions in acquisition cycle by using NDI and concurrency (overlapping some phases in the acquisition cycle). A second survey would be useful to update each

program's initial plans, discover new successful streamlining practices, and identify barriers to implementation of streamlining policy and how to overcome them.

It would also be useful to place survey results and the results of other successful practices in a readily accessible automated database. Initial investigation has identified the Value Engineering Data Information Storage and Retrieval System (VEDISARS) pilot program as a possible vehicle [5-1]. VEDISARS is a database of value-engineering ideas composed of information contained in summary reports of approved and implemented value-engineering proposals. The DoD Industrial Productivity Support Office provides program management, and the Government Industry Data Exchange Program (GIDEP) provides computer support. The information in the database is available to all DoD agencies and Defense contractors to share successful ideas that can be either directly adopted or modified to a similar application.

Three major conferences on acquisition streamlining have been conducted, with the most recent one being the one held in May 1987. The first conference, held in Leesburg, Va., in 1985, presented half-day case histories of the initial streamlining programs: LHX, T-45, C-17, and V-22. At the second conference, held in Crystal City, Va., in 1986, the Deputy Secretary of Defense presented the initial set of four streamlining awards; that conference coincided with issuing the streamlining directive, DoDD 5000.43. The third conference, also held in Crystal City, Va., featured award presentations by the USD(A) and a panel discussion of Military Department acquisition executives. Plans are being formulated to hold additional conferences outside the Washington, D.C., area.

Under OSD leadership, streamlining advocates have been meeting regularly to maintain program oversight. In particular, the agendas have served to resolve critical issues and provide a clearinghouse on streamlining issues, procedures, and techniques. Specific topics that have been addressed include streamlining training, specification tailoring tools, proposed regulatory changes, and plans for new initiatives such as acquisition streamlining for best value.

## TRAINING

Training in acquisition streamlining for DoD program managers, contracting officers, engineers, and other functional specialists has begun at the Defense Systems Management College (DSMC) and within the Services. At DSMC,

acquisition streamlining has been included in the 20-week Program Management Course (PMC), the principal training course for DoD program managers. It has been most prominently treated in discussing the use of specifications and standards. The basic PMC, however, is being revised, and the "New Vision" PMC is to be shorter, modular, and scenario-dependent. Acquisition streamlining should be a more comprehensively integrated part of the new PMC. Streamlining should be included as part of a total quality management approach, with training structured to integrate all program functions related to each other. Producibility engineering and planning, quality, transition from development to production, and acquisition streamlining should be emphasized in an integrated manufacturing and quality training program at DSMC that can also provide guidance for industry training.

The Navy has established its own acquisition streamlining training program. It has created a contractor-prepared 3-day short course in streamlining fundamentals and a second short course in streamlined contracting. Other streamlining courses are being developed to address functional specialty areas such as technical data management. The Army has decided to join with the Navy and adapt the Navy courses to its need. It already has in place an excellent course in the use of specifications and standards at the Acquisition Logistics Management Center at Ft. Lee, Va. The Air Force is conducting ad hoc streamlining training within its current training programs.

## RECOMMENDATIONS

To ensure that streamlining progress is continued, we recommend that the Military Departments develop more and better incentives for acquisition personnel and industry to follow streamlining principles and apply streamlining techniques. We also recommend that streamlining implementation be carefully monitored by the USD(A) through a program of oversight that provides visibility on streamlining benefits and costs and on the barriers and impediments to streamlining and how they are overcome.

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19. ABSTRACT *(Continue on reverse if necessary and identify by block number)*

Acquisition streamlining is any action that reduces the time and cost or improves the efficiency of acquiring and fielding weapon systems and materiel. It began as an effort to eliminate unnecessary specifications and standards and to tailor others to the specific application. It has now been expanded to include procurement procedures and the requirements definition process. Examples of streamlining progress to date include avoiding premature use of specifications and standards, tailoring specifications to unique circumstances, conducting tradeoff analyses of cost and performance in establishing and updating performance requirements, and using nondevelopmental items (NDI) rather than undertaking new development. Challenges still remain in other areas. Specifically, in using specifications and standards properly, establishing practical performance requirements, striving for best value in source selection, and consolidating progress to date and extending the benefits of streamlining throughout all of DoD acquisition. Specific recommendations are included on using specifications and standards, formulating performance requirements, and using NDI.

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