United States General Accounting Office

GAO

Briefing Report to the Chairman, Committee on Government Affairs, U.S. Senate

October 1996

ACQUISITION REFORM

Implementation of Title V of the Federal Acquisition Streamlining Act of 1994

GAO/NSIAD-97-22BR

GAO

United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

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October 31, 1996

The Honorable Ted Stevens
Chairman, Committee on Governmental Affairs
United States Senate

Dear Mr. Chairman:

As you requested, we reviewed the Department of Defense's (DOD) and civilian agencies' implementation of the performance-based acquisition management provisions of title V of the Federal Acquisition Streamlining Act (FASA) of 1994 (P.L. 103-355). Specifically, we determined (1) the status of DOD's and civilian agencies' implementation of title V requirements, (2) the agencies' progress in implementing title V in the required time frames, and (3) significant obstacles and barriers to effective implementation.

Background

Congress has long been concerned that federal agencies' acquisition practices are wasteful and add billions to acquisition costs. For example, cost overruns of more than 100 percent have been reported in DOD and Federal Aviation Administration programs. FASA, signed into law on October 13, 1994, contained more than 200 sections changing the laws that govern how agencies acquire almost $200 billion of goods and services annually. Title V of FASA is designed to foster the development of (1) measurable cost, schedule, and performance goals and (2) incentives for acquisition personnel to reach these goals. Title V performance-based management provisions are detailed in subtitle A for DOD and subtitle B for civilian agencies.

Within 1 year of FASA's enactment, or by October 13, 1995, major elements of subtitles A and B require federal agencies to

- establish cost, schedule, and performance goals for acquisition programs and annually report on the progress in meeting these goals;
- establish personnel performance incentives linked to the achievement of these goals; and
- submit recommendations for legislative changes necessary to facilitate and enhance the management of acquisition programs and the acquisition workforce based on performance.

Additionally, subtitle A requires DOD to report annually on whether the time required for incorporating new technology into major weapon systems has decreased by 50 percent and to review its acquisition program cycle regulations. Subtitle B requires the administrator of the Office of Federal Procurement Policy (OFPP) of the Office of Management and Budget (OMB), in consultation with the heads of civilian agencies, to develop results-oriented acquisition process guidelines for property and services.

On September 24, 1996, we briefed your staff on our review. This report summarizes the information presented in that briefing.

Results in Brief

Table 1 summarizes federal agencies' status progress in complying with title V timeframes and requirements.

Table 1: Status of DOD's and Civilian Agencies' Title V Implementation

Title V provision	DOD	Civilian agencies
Establish cost, schedule, and performance goals	Yes	In process
Implement personnel performance incentives	No	No
Recommend personnel legislation, if needed	None	None
Assess technology insertion timeframes	In process	N/A[a]
Review acquisition program cycle regulations	Yes	N/A
Develop acquisition process guidelines	N/A	In process

Note: Reflects implementation status for fiscal year 1995. Implementation status for fiscal year 1996 will be reported to Congress in the second quarter of fiscal year 1997.

[a]N/A = not applicable.

A more in-depth discussion of agencies' compliance in fiscal year 1995 with title V requirements follows.

DOD's Compliance Status

While DOD complied with the majority of title V's requirements, it did not establish a personnel system with enhanced incentives within 1 year after FASA's enactment. DOD currently plans to use personnel system

demonstration projects that may last several years before doing so. DOD did, however, contract with the Logistics Management Institute (LMI) to benchmark commercial personnel incentive practices and examine those available to DOD. Based on LMI's findings, DOD officials concluded that a significant barrier in establishing this personnel system is the inability to pay monetary incentives to military personnel. Other barriers reported by DOD include the inability to retain program savings for reinvestment purposes; the lack of authority to promote civilians in place for accomplishing specific acquisition objectives; and the conclusion that program management does not have the necessary control over cost, schedule, and performance goals.[1]

DOD's plan for demonstration projects includes draft recommendations for legislative changes to authorize performance payment incentives to all members of a program team, including government civilians, military personnel, and contractors. (According to DOD, current demonstration project authority permits civilians to be promoted in place.) In addition, DOD would also link program savings and employee efforts by authorizing the use of program funds to make performance payments.

As required by subtitle A, DOD reviewed its acquisition guidelines and updated them, including information on how to establish and measure cost, schedule, and performance goals. It also reported in the Secretary of Defense's Annual Report to the President and the Congress for fiscal year 1995 that all but 4 of DOD's 74 major acquisition programs met these established goals. In addition, DOD reported that the time required to insert technology into major weapon systems had decreased from 115 to 113 months (or roughly from 9.5 to 9.4 years). A DOD process action team had reviewed acquisition program cycle regulations and DOD updated them in its acquisition guidelines.

Civilian Agencies' Compliance Status

Based on its initial assessment, OMB concluded that many civilian agencies have not been applying performance-based management techniques as required by subtitle B. OMB lacked sufficient information to evaluate whether the cost, schedule, and performance goals for fiscal year 1995 had been met. For example, only 14 agencies provided the requested information to OFPP and, based on our review of the information, we

[1]We have reported that major sources of program instability (i.e., repetitive budget and program reviews by other participants in the defense acquisition process) tend to limit program management's overall control. See Weapons Acquisition: A Rare Opportunity for Lasting Change (GAO/NSIAD-93-15, Dec. 1992).

determined that much of it was incomplete, inconsistent, and generally not useful for establishing goals and measuring their attainment.

However, OMB is coordinating and monitoring civilian agencies' attempts to address subtitle B requirements. As its primary effort, OMB issued Circular A-11, Part 3, "Planning, Budgeting, and Acquisition of Fixed Assets" (July 16, 1996) that integrates title V requirements with the planning, budgeting, and fixed assets acquisition requirements of the Information Technology Management Reform Act of 1996 and the annual performance plans called for by the Government Performance and Results Act of 1993. When these requirements are fully implemented in fiscal year 1998, reporting on cost, schedule, and performance goals for major acquisition programs is expected to (1) be a formal part of civilian agencies' planning and budgeting activities and (2) present a unified picture of agencies' management activities.

Although OMB's existing policy, OFPP Policy Letter 92-3, established workforce requirements for purchasing and contracting officials, OMB has not issued final guidelines on (1) acquisition workforce management (i.e., standards, training and education requirements, etc.) for designated acquisition positions or (2) a personnel system with enhanced incentives for acquisition employees.

In December 1995, OFPP distributed draft guidance on acquisition workforce requirements and on personnel performance incentives. Civilian agencies raised some significant concerns due to OMB's use of the DOD model for its workforce requirements guidance. Civilian agencies also raised concerns about the draft personnel performance incentives guidance, which they broadly characterized as "onerous and burdensome." Additionally, OMB officials believed that another barrier to implementing a personnel system with enhanced incentives is that agencies have not developed a baseline for their acquisition programs, a process that is expected to be completed by the end of fiscal year 1998. However, a limited pilot or test of an updated personnel system may be conducted before the end of fiscal year 1998, when full implementation is expected. OMB advised us that it had not identified any additional legislation necessary to facilitate management of acquisition programs and performance-based management of the acquisition workforce.

Agency Comments

In commenting on a draft of this report, DOD and OFPP generally concurred with our findings. They also provided some technical corrections, which we have incorporated where appropriate.

Scope and Methodology

To determine the status of DOD's implementation of title V and results to date, we obtained supporting documentation from officials in the (1) Office of the Under Secretary of Defense for Acquisition and Technology (Acquisition Reform) responsible for coordinating its implementation and (2) Office of the Under Secretary of Defense for Acquisition and Technology (Program Integration). The documentation allowed us to assess DOD's progress in meeting title V time frames and document barriers to implementation identified by DOD. We also examined DOD's methodology used to ensure compliance with title V cost, schedule, and performance requirements and discussed it with appropriate officials.

OMB is responsible for establishing guidance and coordinating and assessing civilian agencies' implementation progress. To determine the status of civilian agencies' implementation of title V and results to date, we obtained supporting documentation from OMB officials in OFPP's Procurement Innovation Branch. The documentation allowed us to assess civilian agencies' progress in meeting title V time frames. We also discussed key implementation barriers identified by OFPP.

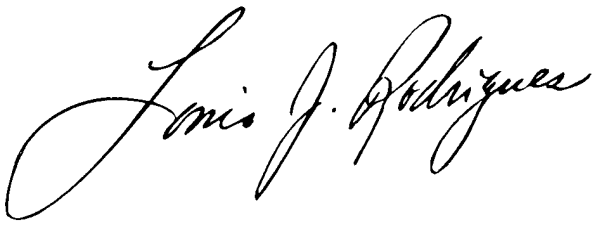
We did not independently verify the reliability of the agencies' existing management information systems that title V required the agencies to use for data collection.

We performed our review from May 1996 to September 1996 in accordance with generally accepted government auditing standards.

We are sending copies of this report to the Secretary of Defense, the Office of Management and Budget, and interested congressional committees. Copies of this report will also be made available to others upon request.

Please contact me at (202) 512-4841 if you or your staff have any questions concerning this briefing report.

Sincerely yours,



Louis J. Rodrigues
Director, Defense Acquisitions Issues

Contents

Abbreviations

DOD	Department of Defense
FASA	Federal Acquisition Streamlining Act
LMI	Logistics Management Institute
OFPP	Office of Federal Procurement Policy
OMB	Office of Management and Budget

Title V Implementation—DOD

GAO Defense Acquisition Program Goals

- Establish cost, schedule, and performance goals for major programs and each program phase.
- Report annually on whether major and nonmajor programs are achieving 90 percent of program goals.
- Conduct a timely review of programs to identify suitable action if specific goals are not achieved.
- Ensure DOD Comptroller evaluation of cost goals.

Even before the Federal Acquisition Streamlining Act's (FASA) enactment, 10 U.S.C. 2435 required the Department of Defense (DOD) to establish cost, schedule, and performance goals in an acquisition program baseline document[1] for each major defense acquisition program. DOD has subsequently updated its acquisition policies to accomplish several objectives, including the incorporation of new laws such as FASA. DOD Directive 5000.1 and DOD Regulation 5000.2-R, issued March 1996, incorporate DOD's implementation of title V performance-based management provisions.

The Director of Acquisition Program Integration determines, at the end of each fiscal year, if each major acquisition program has reached 90 percent or more of its cost, schedule, and performance parameters when compared to acquisition program baseline thresholds. The appropriate decision authority must make a similar determination for nonmajor acquisition programs. If 10 percent or more of a program's parameters are missed, a timely review is required to address whether the breached program is needed and to recommend suitable action, including termination. Major acquisition program baselines must be coordinated with DOD's Comptroller before approval.

DOD included the results of its annual review of major acquisition programs in the Secretary of Defense's Annual Report to the President and the Congress for fiscal year 1995. DOD reported that, as of September 30, 1995, all but 4[2] of 74 major acquisition programs met more than 90 percent of their goals. For these four programs, DOD changed the acquisition program baselines on two, restructured one, and terminated the remaining program. Although the report excluded information on nonmajor defense acquisition programs, DOD sent a memorandum to Congress in June 1996 that (1) listed nonmajor programs not meeting the requirements in accordance with subtitle A and (2) explained the differences in reporting requirements for major and nonmajor programs.

[1]An acquisition program baseline document is an agreement between the program management office and the appropriate decision authority that establishes the cost, schedule, and performance objectives and thresholds for each major acquisition program. For most major acquisition programs, the Under Secretary of Defense for Acquisition and Technology is the decision authority. For nonmajor programs, the military service acquisition executive performs this function.

[2]The report noted that the following programs were not meeting the goals: Comanche, Joint Standard Target Acquisition Radar System Ground Station Module, Maneuver Control System, and Joint Unmanned Aerial Vehicles.

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Personnel Performance Incentives

- Provide for a system of incentives that relate pay, evaluations, and promotions based on the contribution to program goals.
- Review incentives and personnel actions available for encouraging excellence in acquisition management.
- Submit recommendations to Congress for legislative changes needed to improve the management of acquisition programs and personnel.

DOD did not establish a personnel system with enhanced incentives within a year of FASA's enactment, as required by subtitle A, because DOD officials said that significant barriers prevented them from complying. For example, while they believed that any effective personnel incentive system must treat military and civilian personnel equally, 10 U.S.C. 1124 does not currently allow military personnel to be paid monetary incentives. Furthermore, DOD officials concluded that program managers and their staffs did not have the control over the attainment of cost, schedule, and

performance goals necessary to make such goals the basis for rewards and punishments.

DOD contracted with the Logistics Management Institute (LMI) to benchmark commercial incentive practices and examine the incentives available to DOD. In its November 1995 report to DOD, LMI did not recommend substantial changes to military service and defense agency appraisal systems. However, it did recommend that DOD ask Congress to authorize a 4-year test period to develop and test a team personnel incentive system with annual progress reporting at the end of each fiscal year. Based on the LMI report, DOD concluded that although it could use the current performance appraisal system to evaluate the extent to which program management personnel have reached objectives within their control, it lacked the authority to, among other things, retain program savings for reinvestment purposes, promote civilians in place, or pay monetary incentives to military personnel for achieving specific program goals.

In a draft plan to address subtitle A requirements, DOD officials stated that a key to any personnel system with enhanced incentives is that the personnel must be able to directly and substantially influence the progress toward reaching the goals. DOD officials believed that attaining cost and schedule goals is heavily influenced by the program, budget, and appropriations process and that attaining performance goals is heavily influenced by the requirements set by the military services and the technological approach used by industry.

DOD officials indicated that they are currently designing demonstration projects related to program team performance under the authority of section 4308 of Public Law 104-106 (the National Defense Authorization Act of 1996). These demonstration projects, which may require several years to complete, would provide the basis for the new personnel system. DOD's plan includes a request that Congress approve legislation expanding this authority by allowing DOD to provide pay incentives to all the members of a program team, including government civilians, military personnel, and contractors. According to DOD, current demonstration project authority permits civilians to be promoted in place. In addition, DOD would link program savings and employee efforts by authorizing the use of program funds to make performance payments.

GAO Technology Insertion

- DOD must report annually on whether the average period for converting emerging technology into operational capability has decreased by 50 percent or more from the average period as of the date of FASA's enactment.

Subtitle A requires DOD to report annually on whether the average period for converting emerging technology to operational capability (defined as the period of time from program initiation date to the initial operating capability date) has decreased by 50 percent or more since October 13, 1994 (the date of FASA's enactment). The results for major acquisition programs are included in the Secretary of Defense's Annual Report to the President and the Congress for fiscal year 1995. DOD reported that, as of October 31, 1994, the average period for converting emerging technology into operating technology was 115 months (about 9.5 years). By September 30, 1995, the average period had declined to 113 months. DOD expects to reduce the time for technology insertion in the future by using commercially available technologies; encouraging tradeoffs between cost, schedule, and performance at various development stages; and expanding the use of advanced concept technology demonstrations.[3]

Initially, DOD had some difficulty determining all the appropriate dates for program initiation. There was little consistency on this point because approval to begin an acquisition program does not necessarily start at milestone 1,[4] especially in cases of upgrades and nondevelopmental items. We determined that DOD's Acquisition Program Integration Office has updated its data collection activities to specifically define program initiation dates for use in future reporting.

[3]An advanced concept technology demonstration is a DOD initiative designed to field advanced technologies more rapidly.

[4]Milestone 1 is a decision point in the defense acquisition process designed to determine if the results of concept studies warrant the establishment of a new acquisition program.

GAO Program Cycle Regulations

- DOD must review its regulations to ensure that acquisition program cycle procedures focus on achieving goals consistent with the program baseline description established by 10 U.S.C. 2435.

A DOD process action team reviewed acquisition program cycle regulations. In its December 1994 report, Reengineering the Acquisition Oversight and Review Process, the team made several recommendations to facilitate the milestone review process. On April 28, 1995, the Under Secretary of Defense directed that the following concepts be included in DOD Regulation 5000.2-R:

- Integrated product teams consisting of the Office of the Secretary of Defense and service component staffs are to participate early in the process with the program office teams, resolving issues as they arise, rather than during the milestone decision final review. The program managers are to work with the staffs of the Office of the Secretary of Defense and the service component organizations to develop programs with the highest opportunity for success.
- The Under Secretary of Defense for Acquisition and Technology is to determine the number of milestone reviews and the milestone decision authority for each individual program at program initiation.
- The documents applicable to a specific program milestone are to be determined individually through the integrated product team process and approved by the milestone decision authority. Required documents determined under the concept are not based on any set minimum number of documents beyond those statutorily required.

Title V Implementation—Civilian Agencies

GAO Civilian Acquisition Program Goals

- Establish cost, schedule, and performance goals for major programs.
- Report annually on whether major and nonmajor programs are achieving 90 percent of program goals.
- Determine if programs not meeting goals are needed and identify suitable actions to take.
- Ensure chief financial officer evaluation of cost goals.

To help agencies prepare the initial assessment for fiscal year 1995, the Office of Management and Budget (OMB) issued Bulletin 95-03 "Planning and Budgeting for the Acquisition of Fixed Assets" on June 27, 1995, requesting civilian agencies to provide OMB, with their budget submission, information on all fixed asset acquisitions of $20 million or more. The information was to include (1) baseline cost, schedule, and performance goals; (2) status of program progress; (3) comparison of baseline estimates with current estimates; and (4) descriptions of actions taken to complete or terminate programs that failed to achieve 90 percent of baseline goals. According to the Office of Federal Procurement Policy (OFPP), these requirements were intended to (1) introduce agencies to performance-based management concepts and benefits and (2) integrate OMB's review of acquisition project status into the budget process.

Based on the initial assessment, the OFPP administrator concluded that many civilian agencies have not been applying performance-based management techniques as required by subtitle B. According to OFPP, it lacked sufficient information to evaluate achievement of cost, schedule, and performance goals for fiscal year 1995. For example, only 14 agencies provided the requested information to OFPP and, in our view, the information provided was incomplete, inconsistent, and generally not useful for establishing goals and measuring their attainment. Three agencies reported that they used performance-based management systems to monitor progress. Two of the three agencies used an integrated project or earned value management[1] system on some larger acquisitions, a concept OMB considers integral to civilian agencies' acquisition management processes. (See app. I.)

OMB recognizes the need to improve the management of large acquisitions. OMB believes this can best be achieved by integrating subtitle B requirements with other initiatives designed to (1) improve the planning, budgeting, and management of agency operations and (2) implement the use of procurement performance goals. For example, the Information Management Technology Reform Act of 1996 requires the Director, OMB to encourage the use of performance-based and results-based management for information systems. Further, the Government Performance and Results Act of 1993 requires agencies to develop mission statements, long-range strategic goals and objectives, and annual performance plans. OMB officials believe that integrating these requirements (1) presents a

[1]Earned value is a management technique that determines the variance between planned and actual work accomplished, costs, expenditures, etc.

unified picture of agencies' management activities and (2) links acquisition performance goals to the achievement of program and policy goals.[2]

To implement this integrated approach to acquisition management, OMB (1) initiated a major effort that involves the civilian agencies in developing comprehensive capital programming guidance and (2) issued Circular A-11, Part 3, "Planning, Budgeting, and Acquisition of Fixed Assets" (July 16, 1996). OMB Circular A-11, part 3 supersedes previous guidance in OMB Bulletin 95-03 and revamps civilian agencies' budget submission processes for the upcoming budget cycle (i.e., fiscal year 1998). Circular A-11 also

- reaffirms OMB's full funding policy, which requires civilian agencies to identify the full costs of asset acquisitions before decisions are made on providing resources;
- provides additional guidance on defining fixed assets;
- allows civilian agencies to designate their own major acquisition programs based on (1) the need for special management attention because of a program's importance to the agency's mission; (2) high development, operating, or maintenance cost; (3) high risk; (4) high return; or (5) significant role in the administration of agency programs, finances, property, or other resources;
- requires agencies to report on established baseline cost, schedule, and performance goals, any variances from goals, proposed corrective action, and proposed revisions to baseline goals;
- requires agencies to use performance-based management systems based on either an earned value management system or some other type of management system to monitor the achievement of, or deviation from, baseline goals; and
- requires cost goals to be reviewed by the Chief Financial Officer prior to inclusion in the budget submission.

[2]We reported on the need for agencies to integrate the implementation of laws aimed at creating a more businesslike environment for management and accountability. See Executive Guide: Effectively Implementing the Government Performance and Results Act (GAO/GGD-96-118, June 1996).

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Personnel Performance Incentives

- Establish policy and procedures for designating acquisition positions and managing employees in designated positions.
- Review incentives and personnel actions for acquisition management.
- Provide incentives that relate pay, evaluations, and promotions to contribution to goal attainment.
- Submit recommendations to Congress for legislative changes needed to improve the management of acquisition programs and personnel.

OMB has not yet issued final guidelines on (1) acquisition workforce requirements (i.e., standards, training, education, etc.) for designated acquisition positions or (2) a personnel system with enhanced incentives for acquisition employees. While an existing policy (OFPP Policy Letter 92-3) establishes workforce requirements for purchasing and contracting officials, OFPP is considering guidelines for more specific capabilities based on the value and complexity of the acquisition.

In December 1995, OFPP distributed draft guidance on acquisition workforce requirements and personnel performance incentives. Primarily because OMB used the DOD model for its workforce requirements guidance, the civilian agencies raised some significant concerns about the draft guidance, thereby delaying issuance of final guidance. In the meantime, Congress enacted new acquisition workforce requirements as a part of the Federal Acquisition Reform Act of 1996. To implement those provisions, OFPP developed qualification standards for purchasing and contracting officials, and the civilian agencies are currently reviewing the guidance. OMB is still trying to develop qualification standards for program management officials in civilian agencies.

According to an OMB official, the civilian agencies also had significant concerns about the draft personnel incentives guidance, which they broadly characterized as "onerous and burdensome." OMB officials believe that another barrier to implementing a personnel system with enhanced incentives is that agencies have not baselined their acquisition programs, a process that is expected to be completed by the end of fiscal year 1998. However, a limited pilot or test of an updated personnel system may be conducted before the end of fiscal year 1998, when full implementation is expected.

OMB officials did not identify a need for any additional legislation for facilitating and enhancing the management of acquisition programs and the management of the acquisition workforce based on performance. However, they believe that the provisions of the Federal Acquisition Reform Act of 1996 and the Information Technology Management Reform Act of 1996 increase contracting officials' ability to focus on results rather than process. For example, the Federal Acquisition Reform Act of 1996 increases flexibility in conducting procurements. The Information Technology Management Reform Act of 1996 requires processes for analyzing information system risks and results, as well as performance reports on the benefits achieved from information systems acquisitions.

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Process Guidelines

- Develop results-oriented acquisition process guidelines for the acquisition of property and services.
- Include quantitative measures and standards to justify the acquisition of noncommercial items.

To meet the requirements of title V of FASA and Information Technology Management Reform Act of 1996, OFPP is participating in an interagency work group to develop a single, integrated program to plan and monitor acquisitions under the Government Performance and Results Act of 1993. The issuance of OMB Circular A-11, Part 3 was the first step in the process. The second step is for the work group to develop a capital programming guide, which will accompany the 1997 update of Circular A-11. This guide is intended to provide information on

- managing the entire capital budgeting process, including planning, budgeting, procurement, and management of in-use items;
- establishing cost, schedule, and performance goals in the planning and budgeting phases and the use of performance management systems during the procurement phase to monitor goal attainment; and
- analyses of cost efficiency and program performance contribution of in-use items.

When completed, the capital programming guide, in conjunction with the following initiatives, will complete OMB's planned development and implementation of the results-oriented acquisition process guidelines required by title V.

OFPP is also managing the performance-based service contract initiative. These contracts define the government's requirements in terms of measurable performance standards. Under this initiative, government oversight is limited to measuring progress based on the performance standards and contractors' payments are reduced if they fail to meet standards. This ensures that the government only pays for the services actually received.

In addition, the Director of OMB issued a memorandum, dated May 7, 1996, with (1) a report from the President's Management Council Procurement Task Force to agency heads addressing the creation of a "world class acquisition system" and (2) a guide to assist agency senior managers in selecting appropriate performance measures. The Procurement Task Force's report requires each agency to develop a plan by October 1996 for implementing performance measures within the agency for fiscal year 1997. The President's Management Council will oversee the program at least until the initial round of measurements are completed. Agencies will be required to include their measurement goals and results in the annual performance plan required by the Government Performance and Results Act of 1993 beginning with the fiscal year 1999 budget. This will help ensure long-term focus on procurement process improvement.

OMB Circular A-11, Part 3 directs agencies to primarily use commercial and nondevelopmental items to meet their requirements. For example, Circular A-11 states that "emphasis should be placed on generating innovation and competition from private industry and on the use of commercial off-the-shelf and nondevelopmental items . . . ." It further states that each fixed asset considered should be quantitatively evaluated using a systematic analysis of expected benefits and costs.

Illustrative Explanation of Earned Value Concept and Cost and Schedule Variances for Fixed Assets

Introduction.—Earned value is a management technique that relates resource planning to schedules and to technical cost and schedule requirements. All work is planned, budgeted, and scheduled in time-phased "planned value" increments constituting a cost and schedule measurement baseline. There are two major objectives of an earned value system:

—to encourage contractors to use effective internal cost and schedule management control systems; and

—to permit the government to be able to rely on timely data produced by those systems for determining product-oriented contract status.

Baseline.—The baseline plan in Table 1 shows that 6 work units (A–F) would be completed at a cost of $100 for the period covered by this report.

Table 1. Baseline Plan
Work Units

	A	B	C	D	E	F	Total
Planned value ($)	10	15	10	25	20	20	$100

Schedule variance.—As work is performed, it is "earned" on the same basis as it was planned, in dollars or other quantifiable units such as labor hours. Planned value compared with earned value measures the dollar volume of work planned vs. the equivalent dollar volume of work accomplished. Any difference is called a schedule variance. In contrast to what was planned, Table 2 shows that work unit D was not completed and work unit F was never started, or $35 of the planned work was not accomplished. As a result, the schedule variance shows that 35 percent of the work planned for this period was not done.

Table 2. Schedule Variance
Work Units

	A	B	C	D	E	F	Total
Planned value ($)	10	15	10	25	20	20	$100
Earned value ($)	10	15	10	10	20	.....	$65
Schedule variance	.....	.....	.....	−15	.....	−20	−$35 = −35%

Cost variance.—Earned value compared with the actual cost incurred (from contractor accounting systems) for the work performed provides an objective measure of planned and actual cost. Any difference is called a cost variance. A negative variance means more money was spent for the work accomplished than was planned. Table 3 shows the calculation of cost variance. The work performed was planned to cost $65 and actually cost $91. The cost variance is 40 percent.

Table 3. Cost Variance
Work Units

	A	B	C	D	E	F	Total
Earned value ($)	10	15	10	10	20	.....	$65
Actual cost ($)	9	22	8	30	22	.....	$91
Cost variance	−1	+7	−2	+20	+2	.....	+$26 = +40%

Spend comparison.—The typical spend comparison approach, whereby contractors report actual expenditures against planned expenditures is not related to the work that was accomplished. Table 4 shows a simple comparison of planned and actual spending, which is unrelated to work performed and therefore not a useful comparison. The fact that the total amount spent was $9 less than planned for this period is not useful without the comparisons with work accomplished.

Table 4: Spend Comparison Approach
Work Units

	A	B	C	D	E	F	Total
Planned value ($)	10	15	10	25	20	20	$100
Actual cost ($)	9	22	8	30	22	.....	$91
Variance	−1	+7	−2	+5	+2	−20	$−9 = −9%

Source: OMB Circular A-11, part 3, page 17.

Major Contributors to This Report

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