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ELECTRONIC RECORDS ARCHIVE

National Archives Needs to Strengthen Its Capacity to Use Earned Value Techniques to Manage and Oversee Development



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Why GAO Did This Study

Since 2001, the National Archives and Records Administration (NARA) has been working to develop an Electronic Records Archive (ERA) to preserve and provide access to massive volumes and all types of electronic records. However, in acquiring this system, NARA has repeatedly revised the program schedule and increased the estimated costs for completion from \$317 million to \$567 million. NARA is to manage this acquisition using, among other things, earned value management (EVM). EVM is a project management approach that, if implemented appropriately, provides objective reports of project status and unbiased estimates of anticipated costs at completion.

GAO was asked to (1) assess whether NARA is adequately using EVM techniques to manage the acquisition and (2) evaluate the earned value data to determine ERA's cost and schedule performance. To do so, GAO compared agency and contractor documentation with best practices, evaluated earned value data to determine performance trends, and interviewed cognizant officials.

What GAO Recommends

GAO recommends, among other things, that NARA establish a comprehensive plan for all remaining work; improve the accuracy of earned value performance reports; and engage executive leadership in correcting negative trends. NARA generally concurred with GAO's recommendations.

View [GAO-11-86](#) or key components. For more information, contact David A. Powner at (202) 512-9286 or pownerd@gao.gov.

ELECTRONIC RECORDS ARCHIVE

National Archives Needs to Strengthen Its Capacity to Use Earned Value Techniques to Manage and Oversee Development

What GAO Found

NARA has, to varying degrees, established selected best practices needed to manage the ERA acquisition through EVM, but weaknesses exist in most areas (see table). For example, the scope of effort in ERA's work breakdown structure is not adequately defined, thus impeding the ability to measure progress made on contractor deliverables. These weaknesses exist in part because NARA lacks a comprehensive EVM policy, training, and specialized resources and also frequently replans the program. As a result, NARA has not been positioned to identify potential cost and schedule problems early and thus has not been able to take timely actions to correct problems and avoid program schedule delays and cost increases.

Assessment of EVM Best Practices for ERA Program

EVM practice	GAO assessment
Define the scope of effort using a work breakdown structure	●
Identify who in the organization will perform the work	●
Schedule the work	●
Estimate the labor and material required to perform the work and authorize the budgets	●
Determine objective measure of earned value	●
Develop the performance measurement baseline	●
Execute the work plan and record all costs	●
Analyze EVM performance data and record variances	●
Forecast estimates at completion	○
Take management action to mitigate risks	●
Update the performance measurement baseline as changes occur	○

● practice fully implemented ● practice partially implemented ○ practice not implemented

Sources: GAO analysis of agency and contractor data.

ERA's earned value data trends do not accurately portray program status due to the program's weaknesses in implementing EVM; however, historical program trends indicate that future cost overruns will likely be between \$195 million and \$433 million to fully develop ERA as planned and between \$205 and \$405 million at program end (see table). In contrast, the contractor's estimated cost overrun is \$2.7 million. Without more useful earned value data, NARA will remain unprepared to effectively oversee contractor performance and make realistic projections of program costs.

Projected Cost Overruns for ERA Program

Estimate at completion	Current NARA estimate	GAO estimate ^a	Net change (percentage change)
Development phase	\$567 million	\$762 million to \$1 billion	\$195 to \$433 million (34 to 76 percent)
Life cycle	\$995 million	\$1.2 to \$1.4 billion	\$205 to \$405 million (21 to 41 percent)

Sources: GAO analysis of agency and contractor data.

^aThese estimates are being reported as a range since they reflect rough estimates and thus incorporate assumptions made in the absence of validated cost inputs.

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Abbreviations

ANSI	American National Standards Institute
CIO	Chief Information Officer
EIA	Electronic Industries Alliance
EOP	Executive Office of the President
ERA	Electronic Records Archive
EVM	earned value management
IT	information technology
NARA	National Archives and Records Administration
OMB	Office of Management and Budget

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Accountability * Integrity * Reliability

United States Government Accountability Office
Washington, DC 20548

January 13, 2011

The Honorable Thomas Carper
Chairman
Subcommittee on Federal Financial Management,
Government Information, Federal Services,
and International Security
Committee on Homeland Security and
Governmental Affairs
United States Senate

The Honorable Wm. Lacy Clay
Chairman
Subcommittee on Information Policy, Census,
and National Archives
Committee on Oversight and Government Reform
House of Representatives

Since 2001, the National Archives and Records Administration (NARA) has been developing a modern Electronic Records Archive (ERA). This major information system is intended to preserve and provide access to massive volumes of all types and formats of electronic records, independent of their original hardware or software. Moreover, ERA is to manage the entire life cycle of electronic records, from their ingestion through preservation and dissemination to customers. However, in acquiring this system, NARA has repeatedly revised the program schedule and increased the estimated costs for completion from \$317 million to about \$567 million. As a result, the direction of the program was recently changed in July 2010, and NARA is now planning to deploy an ERA system with reduced functionality by the end of fiscal year 2011.

To more effectively manage such investments, the Office of Management and Budget (OMB) has a number of key initiatives under way—one of which was established in 2005 and directs agencies to fully implement earned value management (EVM).¹ EVM is a project management approach that, if implemented appropriately, provides objective reports of project status, produces early warning signs of impending schedule delays and cost overruns, and provides unbiased estimates of anticipated costs at

¹OMB Memorandum, M-05-23 (Aug. 4, 2005).

completion. More recently, in August 2010, OMB identified the ERA program as a high-priority program² across the federal information technology (IT) portfolio.

This report responds to your request that we review NARA's use of EVM to manage the ERA acquisition. Specifically, our objectives were to (1) assess whether NARA is adequately using EVM techniques to manage the acquisition and (2) evaluate the earned value data to determine ERA's cost and schedule performance.

To address our objectives, we reviewed ERA's EVM-related documentation, including project work breakdown structures, project schedules, contractor performance reports, and executive management briefings. In doing so, we compared ERA's EVM practices with both OMB's requirements and key best practices recognized within the federal government and industry for the implementation of EVM. We also evaluated the earned value data from contractor performance reports to determine whether the program is projected to finish within planned cost and schedule targets. In addition, we interviewed relevant agency and contractor officials responsible for implementing EVM.

We conducted this performance audit from March 2010 to January 2011, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. Appendix I contains further details about our objectives, scope, and methodology.

Background

The ability to find, organize, use, share, appropriately dispose of, and save records—the essence of records management—is vital for the effective functioning of the federal government. In the wake of the transition from paper-based to electronic processes, records are increasingly electronic, and the volumes of electronic records produced by federal agencies are

²As part of the administration's Accountable Government Initiative, OMB identified major IT investments across the government that are at risk of failure and require additional oversight. Program selection is based on the following risk factors: (1) significant cost or schedule variance from the current baseline, (2) performance targets or mission objectives have not been met, (3) frequent re-baselines, or (4) lack of essential executive sponsorship/leadership.

vast and rapidly growing, providing challenges to NARA as the nation's record keeper and archivist.

Furthermore, the Presidential Records Act gives the Archivist of the United States responsibility for the custody, control, and preservation of presidential records upon the conclusion of a President's term of office.³ The act states that the Archivist has an affirmative duty to make such records available to the public as rapidly and completely as possible consistent with the provisions of the act.

In response to these widely recognized challenges, NARA began a research and development program to develop a modern archive for electronic records. The final operational ERA system is to consist of the following six key functions:

- *Ingest* enables the transfer of electronic records from federal agencies.
- *Archival storage* enables stored records to be managed in a way that guarantees their integrity and availability.
- *Records management* supports scheduling,⁴ appraisal,⁵ description, and requests to transfer custody of all types of records, as well as ingesting and managing electronic records, including the capture of selected records data (such as origination date, format, and disposition).
- *Preservation* enables secure and reliable storage of files in formats in which they were received, as well as creating backup copies for off-site storage.
- *Local services and control* regulates how the ERA components communicate with each other, manages internal security, and enables telecommunications and system network management.

³44 U.S.C. § 2203(f)(1).

⁴A record schedule is a document that describes agency records, establishes a period for their retention by the agency, and provides mandatory instructions for what to do with them when they are no longer needed for current government business.

⁵Records appraisal is the process of determining the value and the final disposition of records, making them either temporary or permanent.

-
- *Dissemination* enables users to search descriptions and business data about all types of records and to search the content of electronic records and retrieve them.

ERA Acquisition Strategy

In 2001, NARA began developing policies and plans to guide the overall acquisition of an electronic records system. Upon completion of the design phase, the agency awarded a cost-plus-award-fee⁶ contract to Lockheed Martin Corporation in September 2005, worth \$317 million, to develop the ERA system.

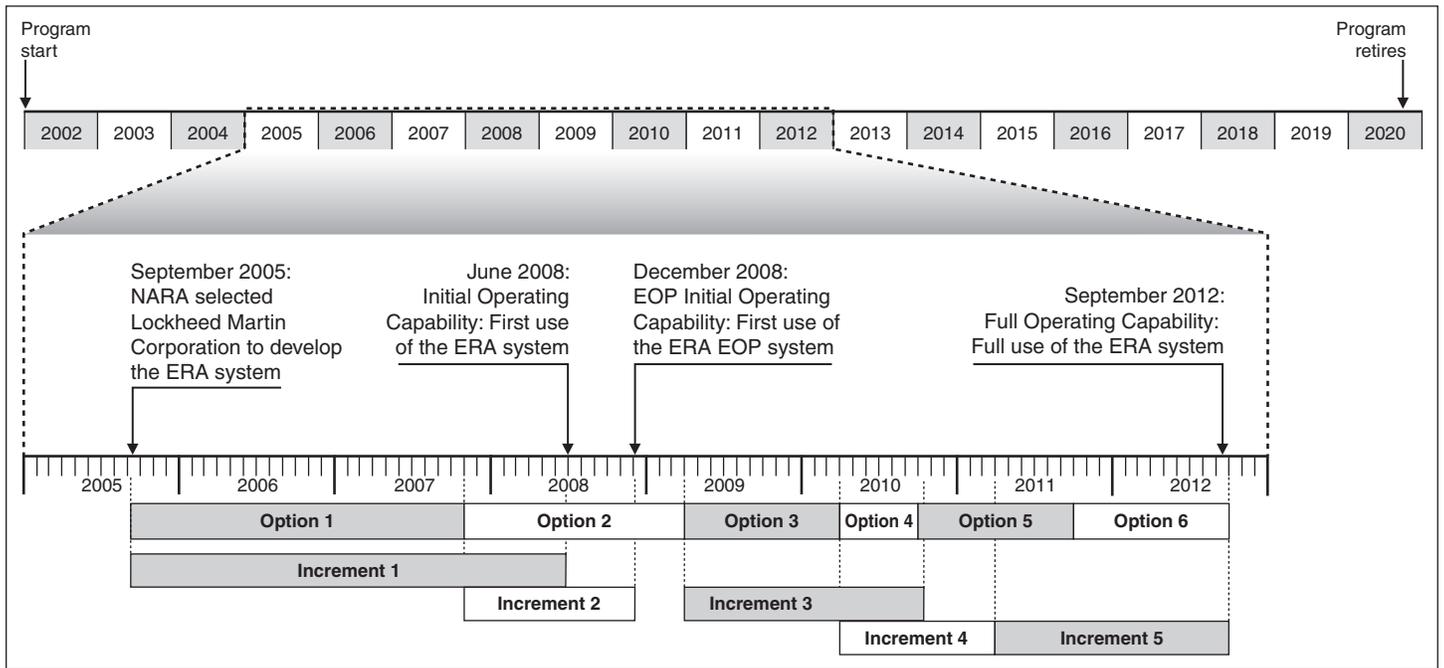
The development contract is composed of six option periods⁷—the first option lasting 2 years and all subsequent options each lasting 1 year (to cover any uncompleted planned work and/or additional new work). The ERA contract is currently in the fifth option period.

Within this contract structure, NARA is to deliver ERA system capabilities in five separate increments. Each period of performance includes specific capabilities associated with one or more increments to be delivered. Increments will overlap to allow the analysis and design activities for the next increment to begin while the testing of the final release of the current increment is under way. Figure 1 illustrates the ERA program plan schedule prior to the recent change in program direction in July 2010 (as discussed later in this report).

⁶A cost-plus-award-fee contract is a cost reimbursement contract that provides for a fee consisting of a base amount fixed at inception of the contract plus an award amount that may be given based upon a judgmental evaluation by the government of contract performance.

⁷Lockheed Martin's contract also includes a base period that reflects system design phase work, which was completed in August 2005.

Figure 1: ERA System Acquisition Strategy, as of June 2010



Source: GAO analysis of NARA data.

Table 1 summarizes the planned system capabilities to be delivered by increment.

Table 1: Summary of Planned ERA System Capabilities by Increment

Increment	Description
Increment 1	<p>Deployed in two releases:</p> <p>Release 1 established the ERA base system—the hardware, software, and communications needed to deploy the system.</p> <p>Release 2 enabled functional archives with the ability to preserve electronic data in their original format, enable disposition agreements and scheduling, and receive unclassified and sensitive data from four federal agencies; according to NARA officials, this increment was certified as complete in June 2008. However, additional enhancements were made to Increment 1, release 2, and were completed in March 2010.</p>
Increment 2	<p>Includes the Executive Office of the President (EOP) system, which was designed to handle records from the Executive Office of the President. This increment was to include the content searching and management for special access requests. The EOP system was certified for initial operating capability in December 2008. However, NARA did not finish ingesting the presidential records it received until September 2009, 9 months after initial operating capability.</p>
Increment 3	<p>Expected to include the following:</p> <p>Storage and access capabilities for electronic records of the Congress and Supreme Court. NARA deployed the first release of Increment 3—the congressional component—in January 2010.</p> <p>Upgrades to the ERA base system to, among other things, search, view, and print records.</p> <p>Public access to provide the public with tools needed to search and access electronic records.</p> <p>Planning for preservation to include development of a preservation framework prototype. The prototype is to include the capability to plan, execute, and monitor preservation activities.</p>
Increment 4	<p>Planned to build upon the base architecture delivered as part of Increment 3, and NARA plans to insert newly available technology, particularly for preservation capabilities. NARA began work on this increment in 2010 and plans to complete it in fiscal year 2011. We have previously reported that NARA has not fully defined the functionality to be included in Increment 4.</p>
Increment 5	<p>Expected to expand on system capabilities implemented in the prior increments. Our prior work has found that NARA has not fully defined the functionality for this increment.</p>

Source: GAO analysis of NARA data.

Since awarding the contract, NARA has made several modifications to the program schedule including, among other things, extending the first two option periods by 2 months and 7 months, respectively. NARA also reduced the period of performance for option period four by 6 months. Additionally, NARA stated that Increment 3 was completed in October 2010⁸ and that they expect to complete Increment 4 by early-2011, both of which are later than the milestones established in program planning documents. Table 2 shows a comparison of the original and revised ERA schedules.

Table 2: Delays in Key ERA Program Milestones, as of June 2010

Milestone	Baseline schedule (September 2005 contract award)	Current schedule	Status of milestone	Change
Increment 1 (ERA Base Instance)	September 2007	June 2008	Completed	9-month delay
Increment 2 (ERA EOP System)	September 2008	December 2008	Completed	3-month delay
Increment 3	September 2009	October 2010	Completed	13-month delay
Increment 4	September 2010	March 2011	In process	6-month delay
Increment 5	September 2011	September 2012	Not yet begun	12-month delay

Source: GAO analysis of NARA documents.

⁸We currently have work under way at NARA to verify the completion of Increment 3, among other things.

Prior GAO Reviews Have Identified Cost and Schedule Issues in ERA's Progress

Since 2002, we have reported and testified on the technical and programmatic challenges that NARA has experienced in acquiring the ERA system, as well as on additional key risks facing the program.⁹ Our most recent report,¹⁰ in June 2010, reported that the estimated cost for ERA through March 2012 increased to more than \$567 million. For example, NARA reportedly spent about \$80 million on the base increment, compared with its planned cost of about \$60 million. According to agency and contractor officials, factors contributing to the increase include unanticipated complexity of the system being developed. In order to enhance NARA's ability to complete the ERA development within reasonable funding and time constraints, we recommended that the agency ensure adequate executive-level oversight by maintaining documentation of investment review results, including changes to the program's cost and schedule baseline and any other corrective actions taken as a result of changes in ERA cost, schedule, and performance.

We further reported that, although NARA initially planned for the system to be capable of ingesting federal and presidential records in September 2007, the two system increments to support those records did not achieve initial operating capability until June 2008 and December 2008, respectively. In addition, a number of functions originally planned for the base increment were deferred to later increments, including the ability to delete records and to ingest redacted records. More notably, we reported that NARA had not detailed what system capabilities would be delivered in the final two increments; it also had not effectively defined or managed ERA's requirements to ensure that the functionality delivered satisfies the

⁹GAO, *Information Management: Challenges in Managing and Preserving Electronic Records*, [GAO-02-586](#) (Washington, D.C.: June 17, 2002); *Records Management: Planning for the Electronic Records Archives Has Improved*, [GAO-04-927](#) (Washington, D.C.: Sept. 23, 2004); *Information Management: Acquisition of the Electronic Records Archives is Progressing*, [GAO-05-802](#) (Washington, D.C.: July 15, 2005); *Electronic Records Archives: The National Archives and Records Administration's Fiscal Year 2006 Expenditure Plan*, [GAO-06-906](#) (Washington, D.C.: Aug. 18, 2006); *Information Management: The National Archives and Records Administration's Fiscal Year 2007 Expenditure Plan*, [GAO-07-987](#) (Washington, D.C.: July 27, 2007); *Information Management: Challenges in Implementing an Electronic Records Archive*, [GAO-08-738T](#) (Washington, D.C.: May 14, 2008); *Electronic Records Archives: The National Archives and Records Administration's Fiscal Year 2009 Expenditure Plan*, [GAO-09-733](#) (Washington, D.C.: July 24, 2009); and *National Archives: Progress and Risks in Implementing its Electronic Records Archive Initiative*, [GAO-10-222T](#) (Washington, D.C.: Nov. 5, 2009).

¹⁰GAO, *Electronic Records Archive: Status Update on the National Archives and Records Administration's Fiscal Year 2010 Expenditure Plan*, [GAO-10-657](#) (Washington, D.C.: June 11, 2010).

objectives of the system. Although NARA established an initial set of high-level requirements, it lacked firm plans to implement about 43 percent of them. As a result, we recommended that NARA ensure that ERA's requirements are being managed using a disciplined process.

OMB Directed Recent Changes to the ERA Program

As a result of our most recent report,¹¹ OMB is working with NARA to remedy the problems we highlighted related to the cost, schedule, and performance of the ERA system. Specifically, in July 2010, OMB directed NARA to halt all development activities by the end of fiscal year 2011 and develop an action plan to address our finding on the lack of defined system functionality for the final two increments of the ERA program and the need for improved strategic planning.

In response, NARA has work under way to revise its program implementation plans and enter the operations and maintenance phase beginning in fiscal year 2012. For development work to be accomplished prior to this date, NARA is to prioritize existing requirements and develop realistic cost and schedule estimates to determine what can be accomplished by the deadline. In addition, NARA also plans to prioritize remaining outstanding requirements (that are to be accomplished under the ERA contract); identify other requirements not yet met by the system; and determine ERA operations and maintenance requirements.

Despite changes in program direction, the Archivist noted that the essential goals of ERA would remain unchanged. He stated that, beginning in fiscal year 2012, ERA would fully support the transfer of electronic records to an archival repository, as well as access to and preservation of electronic archival records. To do this, the Archivist stated that the agency would work on those elements determined to be the highest priorities in fiscal year 2011. According to NARA, this may lead to a second phase of the ERA development in the future.

EVM Provides Insight on Program Cost and Schedule

Given the size and significance of the government's investment in IT, it is important that projects be managed effectively to ensure that public resources are wisely invested. Effectively managing projects entails, among other things, pulling together essential cost, schedule, and technical information in a meaningful, coherent fashion so that managers

¹¹[GAO-10-657](#).

have an accurate view of the program's development status. Without meaningful and coherent cost and schedule information, program managers can have a distorted view of a program's status and risks. To address this issue, in the 1960s, the Department of Defense developed the EVM technique, which goes beyond simply comparing budgeted costs with actual costs. This technique measures the value of work accomplished in a given period and compares it with the planned value of work scheduled for that period and with the actual cost of work accomplished.

Differences in these values are measured in both cost and schedule variances. Cost variances compare the value of the completed work (i.e., the earned value) with the actual cost of the work performed. For example, if a contractor completed \$5 million worth of work, and the work actually cost \$6.7 million, there would be a negative \$1.7 million cost variance. Schedule variances are also measured in dollars, but they compare the earned value of the completed work with the value of the work that was expected to be completed. For example, if a contractor completed \$5 million worth of work at the end of the month, but was budgeted to complete \$10 million worth of work, there would be a negative \$5 million schedule variance. Positive variances indicate that activities are costing less or are completed ahead of schedule. Negative variances indicate activities are costing more or are falling behind schedule. These cost and schedule variances can then be used in estimating the cost and time needed to complete the program.

Without knowing the planned cost of completed work and work in progress (i.e., the earned value), it is difficult to determine a program's true status. Earned value allows for this key information, which provides an objective view of program status and is necessary for understanding the health of a program. As a result, EVM can alert program managers to potential problems sooner than using expenditures alone, thereby reducing the chance and magnitude of cost overruns and schedule slippages. Moreover, EVM directly supports the institutionalization of key processes for acquiring and developing systems and the ability to effectively manage investments—areas that are often found to be inadequate on the basis of our assessments of major IT investments.

In 2005, OMB began requiring agencies, such as NARA, to fully implement EVM on major IT investments.¹² Specifically, this guidance directs agencies to (1) develop comprehensive policies to ensure that their major IT investments are using EVM to plan and manage development; (2) include a provision and clause in major acquisition contracts or agency in-house project charters directing the use of an EVM system that is compliant with the American National Standards Institute (ANSI) standard;¹³ (3) provide documentation demonstrating that the contractor's or agency's in-house EVM system complies with the national standard; (4) conduct periodic surveillance reviews; and (5) conduct integrated baseline reviews¹⁴ on individual programs to finalize their cost, schedule, and performance goals.

Building on OMB's requirements, in March 2009, we issued a guide on best practices for estimating and managing program costs.¹⁵ This guide highlights the policies and practices adopted by leading organizations to implement an effective EVM program. Specifically, in the guide, we identify 11 key practices that are implemented on acquisition programs of leading organizations. These practices include the need for organizational policies that establish clear criteria for which programs are required to use EVM, specify compliance with the ANSI standard, require a standard product-oriented structure for defining work products, require integrated baseline reviews, provide for specialized training, establish criteria and conditions for rebaselining programs, and require an ongoing surveillance function. In addition, we identify key practices that individual programs can use to ensure that they establish a sound EVM system, that the earned value data are reliable, and that the data are used to support decision making.

¹²OMB Memorandum, M-05-23 (Aug. 4, 2005).

¹³Recognizing the importance of ensuring quality earned value data, ANSI and the Electronic Industries Alliance (EIA) jointly established a national standard for EVM systems in May 1998 (ANSI/EIA-748-A-1998). This standard, commonly called the ANSI standard, is composed of guidelines to instruct programs on how to establish a sound EVM system. This document was updated in July 2007 and is referred to as ANSI/EIA-748-B.

¹⁴An integrated baseline review is an evaluation of a program's baseline plan to determine whether all program requirements have been addressed, risks have been identified, mitigation plans are in place, and available and planned resources are sufficient to complete the work.

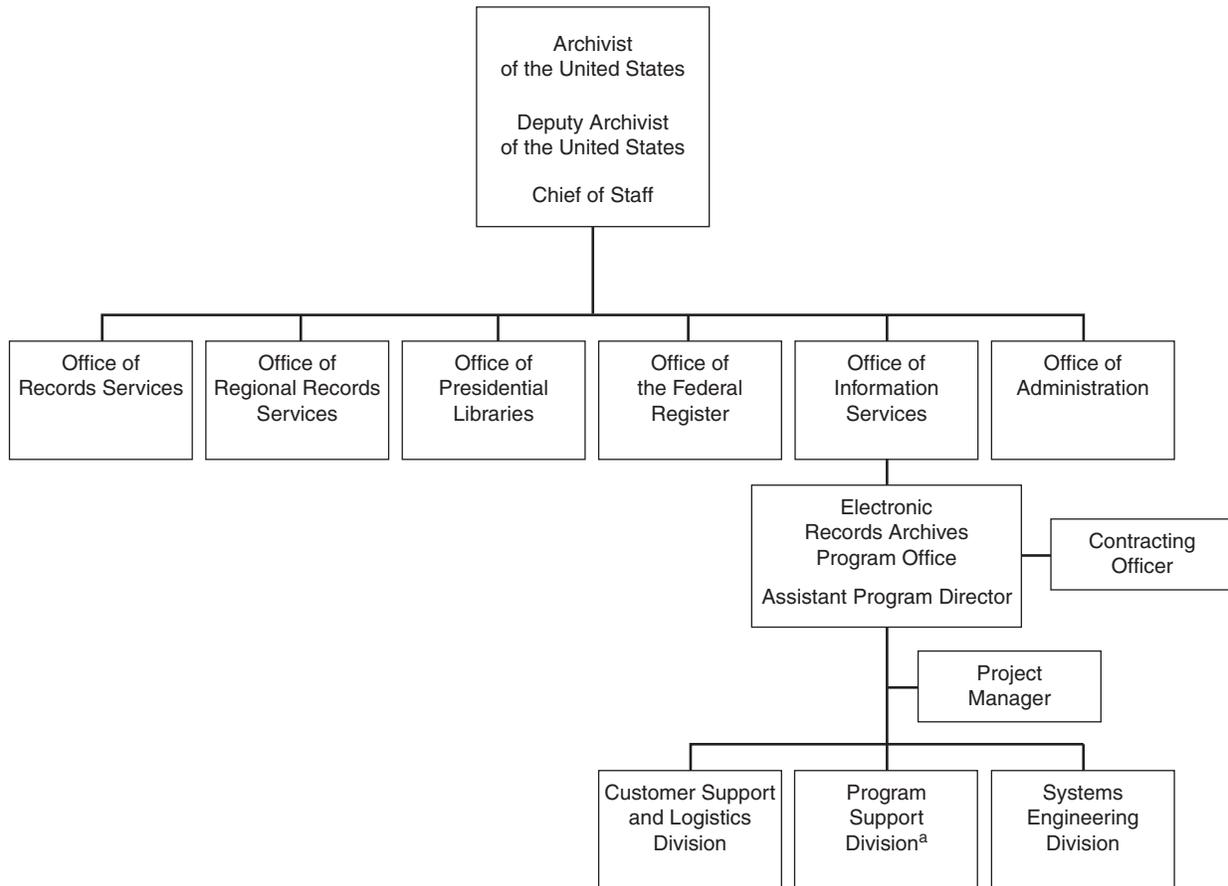
¹⁵GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, GAO-09-3SP (Washington, D.C.: March 2009).

NARA's Chief Information Officer Is Responsible for EVM Implementation

In October 2002, NARA established the ERA Program Management Office, which has primary responsibility for managing the ERA acquisition. The ERA program falls within the oversight of the NARA IT Executive Committee and the Chief Information Officer (CIO). Specifically, the executive committee is comprised of senior NARA decision makers who manage NARA's IT capital planning and investment control process and the NARA IT investment portfolio, which includes the ERA investment. The NARA CIO oversees management of the ERA program and is responsible for EVM implementation across the agency's IT acquisitions.

To support project managers in the execution of EVM, among other things, the CIO established the Capital Planning and Administration Branch to establish policy and guidance, analyze monthly project status reports, identify earned value trends, provide corrective action recommendations, and disseminate project information as appropriate. Furthermore, the ERA Program Director, who reports to the CIO, is responsible for the operational scope of work, performance, budget, and schedule of the program. Additionally, the NARA senior staff, which includes the Archivist and the Deputy Archivist, provide oversight and risk management as required. Figure 2 illustrates the organizational structure for the ERA program.

Figure 2: Simplified ERA Program Organizational Structure



Source: GAO analysis of NARA data.

^aEVM activities occur within the Program Support Division.

NARA Has Yet to Fully Establish Most EVM Practices to Manage the ERA Acquisition

NARA has, to varying degrees, established certain best practices needed to manage the ERA acquisition through EVM. Our work on best practices in EVM identified 11 key practices that are implemented on acquisition programs of leading organizations. These practices can be organized into three management areas: establishing a comprehensive EVM system, ensuring reliable earned value data, and using those data to make decisions. The ERA program fully met 2 of the 11 key practices for implementing EVM, partially met 7 practices, and did not meet 2 others. These weaknesses exist in part because NARA lacks a comprehensive EVM policy, as well as training and specialized resources. NARA also

frequently replans the ERA program. Without effectively implementing EVM, NARA has not been positioned to identify potential cost and schedule problems early and thus not been able to take timely actions to correct problems and avoid program schedule delays and cost increases. Table 3 lists the 11 key EVM practices by management area and summarizes the status of NARA's implementation of each practice.

Table 3: Assessment of EVM Best Practices for NARA's ERA Program

Program management area	EVM practice	GAO assessment
Establish a comprehensive EVM system	Define the scope of effort using a work breakdown structure.	●
	Identify who in the organization will perform the work.	●
	Schedule the work.	●
	Estimate the labor and material required to perform the work and authorize the budgets, including management reserve.	●
	Determine objective measure of earned value.	●
	Develop the performance measurement baseline.	●
Ensure that the data resulting from the EVM system are reliable	Execute the work plan, and record all costs.	●
	Analyze EVM performance data, and record variances from the performance measurement baseline plan.	●
	Forecast estimates at completion.	○
Ensure that the program management team is using earned value data for decision-making purposes	Take management action to mitigate risks.	●
	Update the performance measurement baseline as changes occur.	○

Key:

- : The agency addressed all aspects of this EVM practice.
- ◐: The agency addressed some, but not all, aspects of this EVM practice.
- : The agency did not address any aspects of this EVM practice.

Sources: GAO analysis of NARA and contractor data.

NARA Did Not Fully Establish a Comprehensive EVM System

The ERA program did not fully establish a comprehensive EVM system. Of the six key practices in this management area, the program fully implemented one, and partially met five. Specifically, the agency's program organization charts and contract work breakdown structure fully identified the personnel responsible for performing the defined work. However, critical weaknesses remain in the following other key practices:

-
- *Define the scope of effort using a work breakdown structure.* The ERA program maintains a work breakdown structure that is consistent with work planned in the project schedule; however, this structure neither reflects the entire scope of the program, nor is it defined in such a way to provide meaningful understanding of the products or deliverables being developed. Specifically, the work breakdown structure did not include work planned for Increment 4 and beyond. Furthermore, the structure was defined by program increment rather than by major program/system component (e.g., ERA base, EOP), and the work planned in these increments was not broken down in a standardized fashion, thus making it difficult to track common work elements across increments. Without a work breakdown structure that is comprehensive, product-oriented, and standardized, ERA cannot efficiently track and measure progress made on contractor deliverables.
 - *Schedule the work.* The ERA project schedule had activities that were adequately sequenced; however, it also had a number of weaknesses that undermined the quality of the established performance baseline. These weaknesses included an invalid critical path (the sequence of activities that, if delayed, impacts the planned completion date of the project); a lack of resources assigned to all activities; and the excessive or unjustified use of constraints, which impairs the program's ability to forecast the impact of ongoing delays on future planned work activities.

To the contractor's credit, it is aware of many of the deviations from scheduling best practices and has controls in place to monitor them. However, these weaknesses remain a concern because the schedule serves as the performance baseline against which earned value is measured, and any weaknesses impair the use of the schedule as a management tool.

- *Estimate the labor and material required and authorize the budgets.* The establishment of a sound baseline plan, which would include estimating the labor and materials required to perform the work, was not thoroughly completed through an integrated baseline review. Although NARA performed integrated baseline reviews prior to exercising each option period, as well as after a major rebaseline, the most recent review, held in December 2009, showed that none of the corrective actions needed to mitigate program risks—including reducing a large amount of work not being measured objectively—had been taken. Without a fully completed integrated baseline review, NARA has not taken the proper steps to determine whether the baseline plan contains an acceptable level of risk and that significant risks have been mitigated. While the contractor has established management reserves to cover realized risks in the baseline plan and reports reserve levels to NARA on a monthly basis, the lack of a

sufficient review makes it difficult to determine whether the amount of reserve set aside is justified.

- *Determine objective measure of earned value.* Objective measures were not always used for determining a majority of work planned. For example, as of February 2010, approximately 17 percent of the program's baseline budget was classified as nonobjective (also called level-of-effort¹⁶). Our research shows that, if more than 15 percent of the baseline is measured using level-of-effort, then that amount should be scrutinized because it does not allow schedule performance to be measured. NARA identified the use of nonobjective metrics as a concern in its most recent integrated baseline review; however, it did not take action to address this concern. Until NARA ensures that metrics used to measure the progress made on planned work elements are appropriate, it cannot be assured that ERA's measurements of accomplishments are sufficiently credible.
- *Develop the performance measurement baseline.* ERA's performance measurement baseline¹⁷ does not contain sufficient budget to cover all remaining work on the program since Increment 4 and beyond have not yet been fully defined, and the work deferred to later increments was not reflected in the existing earned value data or other baseline planning documents. As such, NARA does not have a stable baseline against which to measure performance and to support predictions of future performance through completion.

Program Did Not Adequately Ensure That EVM Data Were Reliable

The ERA program did not adequately ensure that ERA's earned value data were reliable. Of the three key practices in this management area, the program fully implemented one, partially met one, and did not meet the remaining one. Specifically, the program has processes in place to identify and record cost and schedule variances and review earned value data using monthly contractor EVM performance reports. In addition, the ERA program office reviews contractor EVM data on a regular basis to track contractor performance, including incorporating EVM data into monthly program management reviews. However, the program has not adequately

¹⁶Level-of-effort is unmeasured effort of a general or supportive nature that does not produce definitive end products (e.g., program administration).

¹⁷The performance measurement baseline represents the cumulative value of the planned work over time. It takes into account that program activities occur in a sequenced order, based on finite resources, with budgets representing those resources spread over time. Deviations from the baseline identify areas where management should focus attention.

recorded variances from the performance baseline or been able to forecast estimates at completion using EVM:

- *Analyze EVM performance data and record variances.* The contractor's monthly reports include justifications for cost and schedule variances; however, these justifications are not sufficiently detailed for NARA program management to fully understand the reasons for the variances and the contractor's plan for resolving them. In particular, the justifications of variances for the base system augmentation work, a major part of Increment 3, did not discuss the impact of the problem and comprehensive corrective actions to be taken. As a result, the program office cannot track and mitigate related risks.

Furthermore, the monthly reports also showed a number of anomalies that raise questions regarding the reliability of the earned value data. Examples are as follows:

- Planned work was removed from the baseline without also removing its corresponding budget. This is an inappropriate EVM practice and results in the appearance of favorable cost and schedule performance trends.
- Work was shown as fully completed in one month's report but, in subsequent reports, the same work was reported as less than 100 percent complete. For example, Increment 3 development work was reported as 100 percent complete in July 2009, but 2 months later, in September 2009, it was reported as 10 percent complete. In another example, program support activities for Increment 3 were reported as 100 percent complete in August 2009, but in the subsequent month as 49 percent complete.
- Dollars were reported as spent in a given month, but no work was reported as scheduled or completed.

NARA program and contractor officials provided justifications for these anomalies, such as extension of the period of performance. However, these justifications were not always valid. In particular, program officials cited lagging invoices as a major contributor to these anomalies. As such, the reconciliation of estimated costs to actual costs was not reflected in the earned value reports until, in some cases, up to 15 months after the fact. Lagging invoices can create false positive or negative variances and, as such, the timely reconciliation of these costs is necessary for obtaining reliable data. Until NARA improves its ability to assess contractor data and resolve anomalies, it risks using inaccurate data to manage the program,

potentially resulting in additional cost overruns, schedule delays, and performance shortfalls.

- *Forecast estimates at completion.* The ERA program is unable to forecast costs at program completion based on the earned value data it receives because these data reflect contractor performance trends in one increment, not the full development program.

Program Management Team Did Not Effectively Use Earned Value Data to Make Decisions

The ERA program did not effectively use earned value data to inform programmatic decisions. Of the two key practices, the program partially met one and did not meet the other practice. Specifically, the program office included earned value performance trend data in monthly performance management review briefings. In addition, the cost and schedule drivers causing poor trends (as identified in the monthly contractor reports) were generally consistent with the risks and issues contained in the program risk registers. Nevertheless, critical weaknesses remain in this management area. Examples of those weaknesses are as follows:

- *Take management action to mitigate risks.* NARA management did not take all necessary actions to mitigate risks. First, according to NARA officials, the CIO, Program Director, and contractor executives meet weekly and discuss cost and schedules issues when appropriate. However, NARA does not document the results of these briefings, and thus there is little evidence that this body has reviewed and approved cost and schedule issues. There is also little evidence that it identified corrective actions and tracked them to closure. Second, the briefings to senior executives are inconsistent. For example, in January 2010, the program team reported to the Program Director that unless Increment 3 work was replanned into Increment 4, they anticipated a cost overrun of \$2.0 million. However, in other briefings to senior NARA management and OMB, it was reported that the cost performance remained steady.

Moreover, while ERA earned value data trends are included in briefing materials provided to NARA senior executives, these cost and schedule performance trends are not discussed in these management meetings. Until NARA uses earned value data to make program decisions, it will be unable to effectively identify areas of concern and make recommendations to reverse negative trends.

- *Update the performance measurement baseline.* NARA was unable to demonstrate that it maintains changes made to the program's performance

measurement baseline as they occur. While the program office maintains a log of contract modifications, the changes it specified could not be mapped back to the baseline. Specifically, the changes detailed in this log did not identify the specific elements of the work breakdown structure being impacted, which makes it nearly impossible to determine whether these changes had been properly incorporated into the baseline. Additionally, the performance measurement baseline is not appropriately updated when functionality is deferred. While program officials stated that they remove corresponding budget from the baseline for work that has been moved out of the baseline, there is little evidence supporting this. Moreover, changes are not made to the baseline in a timely manner. For example, the base system augmentation replan was identified in September 2009, but it was finalized into the baseline in June 2010, almost 9 months later.

Weaknesses in EVM Implementation Are Due in Part to Key Factors at the Program and Agency Levels

The weaknesses we identified in the three management areas exist, in part, because of a number of key factors:

NARA-wide EVM policy: As we have previously reported,¹⁸ a comprehensive EVM policy is an important aspect of instituting a sound EVM program. NARA's policy, established in 2005, outlines clear criteria for which IT programs are to use EVM. However, it does not require EVM training for senior executives with oversight responsibility, program managers, or relevant program staff responsible for contract management. The policy also does not require annual EVM system surveillance to ensure program compliance with the industry standard. The ERA program office provided documentation that a surveillance review was performed in April 2009; however, a number of outstanding corrective action items resulting from this review were not closed. Moreover, the program could not provide documentation to show that regular surveillance reviews were performed in past years. Without such policies, NARA is not positioned to ensure that ERA's program staff have the appropriate skills to validate and interpret EVM data, and that its executives fully understand the data they are given in order to ask the right questions and make informed decisions.

Specialized program resources: The program office lacks the appropriate levels of skilled EVM personnel. In a past governmentwide review,¹⁹ we

¹⁸GAO, *Information Technology: Agencies Need to Improve the Implementation and Use of Earned Value Techniques to Help Manage Major System Acquisitions*, [GAO-10-2](#) (Washington, D.C.: Oct. 8, 2009).

¹⁹[GAO-10-2](#).

reported on successful EVM implementation on major IT projects at the Department of Homeland Security and the Federal Aviation Administration; these projects, all similar in size to ERA, had between four and eight EVM specialists on staff to complete such activities. At this time, the ERA program has two resident specialists on staff to oversee and monitor contractor performance for all components of the program; however, their responsibilities also extend beyond EVM to other areas of program control. Given the extent of earned value data anomalies we found, and the frequency with which the performance baseline is replanned, it is essential that the program office have the appropriate level of personnel in place to perform EVM analysis and oversight activities. Without an appropriate level of staffing, the program office will likely continue to experience issues in obtaining reliable earned value data.

Acquisition strategy approach: Our body of work²⁰ has shown that frequent rebaselines on a systems acquisition program allow real performance to be hidden, leading to distorted EVM data reporting. The weaknesses associated with ERA's performance baseline are largely due to frequent rebaselining. Program and contractor officials attributed this to ERA's current acquisition strategy approach, which calls for NARA to renegotiate the contract (or replan the baseline) with every option period. As such, NARA is unable to produce a stable and comprehensive baseline that reflects all development work planned for the system. Instead, a new baseline is created for each option period—so work that was not completed in one option period gets replanned or removed in the subsequent one, thus resetting all past contractor cost and schedule performance.

We agree that the program's current implementation of the acquisition strategy is inherently incompatible with the use of EVM. Moreover, this environment sets the contractor up to be favorably positioned to receive a high award fee for each period of performance because the constant rebaselining makes it easier for the contractor to excel at achieving the objectives measured by the award fee evaluation process. In addition, it also makes the program highly inefficient because it must focus significant

²⁰GAO, *Secure Border Initiative: DHS Needs to Strengthen Management and Oversight of its Prime Contractor*, [GAO-11-6](#) (Washington, D.C.: Oct. 18, 2010); *Defense Acquisitions: Missile Defense Program Instability Affects Reliability of Earned Value Management Data*, [GAO-10-676](#) (Washington, D.C.: July 14, 2010); and *National Airspace System: Better Cost Data Could Improve FAA's Management of the Standard Terminal Automation Replacement System*, [GAO-03-343](#) (Washington, D.C.: Jan. 31, 2003).

effort on program replanning instead of on the ERA system development work.

Until NARA changes its acquisition strategy and establishes a comprehensive baseline for the program, its EVM practices will continue to be hampered with weaknesses, and its ability to obtain the insight needed to effectively manage the contractor will be impeded.

ERA's Earned Value Data Do Not Reflect True Program Status or the Magnitude of Future Cost and Schedule Increases

ERA's earned value performance trends do not accurately portray program status, and our analysis of historical program trends indicate that future cost and schedule increases will likely be significant. Due to the limited implementation of EVM practices and the presence of data anomalies (both previously discussed), ERA's earned value data reflect only a small portion of the work actually being performed. As such, we relied on other historical ERA program performance data to construct a projected range of costs at completion (see app. I for details). We previously reported, in June 2010, that NARA completed about 60 percent of ERA's system requirements.²¹ If NARA pursues its original set of requirements, and the contractor maintains its current rate of productivity, it is unlikely that more than 65 percent of them will be completed by the revised contract end date of September 2011. We further project that the total cost overrun incurred at contract end could roughly be between \$285 million and \$334 million.

Plans for the completion of the remaining development work once the contract ends are being reevaluated by NARA at the direction of OMB (as previously discussed). According to the Archivist, the essential goals of ERA will remain unchanged and may lead to a second phase of the development in the future. If NARA were to complete the full ERA system as originally designed, we project the development phase to be complete by March 2017 with a total cost overrun between \$195 million and \$433 million. We further project that the total cost overrun incurred at the end of the program life cycle will likely be between \$205 million and \$405 million. Table 4 shows our cost and schedule estimates as compared with NARA's estimates for the program.

Our projection assumes that past trends are indicative of future performance and does not take into account the degree of difficulty of the

²¹[GAO-10-657](#).

work being performed. This is critical because the work that remains includes system integration and testing activities that are complex and often the most challenging to complete based on our review of similar IT programs. Furthermore, in making our projection of total life cycle cost, we applied the same estimated operations and maintenance cost used by NARA. We did not validate the credibility of the operations and maintenance cost estimate. Based on these assumptions, we believe our rough estimates are conservative and that the final costs at completion could be even higher.

Table 4: NARA and GAO Estimates at Completion for the ERA Program

	NARA estimate, as of Jan. 2002	Current NARA estimate, as of July 2010	GAO estimate	Net change from current NARA estimate to GAO estimate (percentage change)
Development phase completion	September 2011	September 2011	March 2017	67 months
Development phase estimate at completion	\$317 million	\$567 million	\$762 million to \$1 billion	\$195 to \$433 million (34 to 76%)
Life cycle cost estimate	\$745 million	\$995 million	\$1.2 to \$1.4 billion	\$205 to \$405 million (21 to 41%)

Sources: GAO analysis of ERA program and contractor data.

In contrast, contractor-provided data from January 2009 to June 2010, show that the contractor has exceeded its cost target by \$1.6 million and has not completed about \$2 million worth of planned work. The contractor reported that the negative cost and schedule variances are largely due to unanticipated development work required to integrate specific commercial-off-the-shelf products into the base system and unplanned software code growth in key areas, including ingest orchestration and archive search capability. Based on current performance trends, the contractor estimates it will incur a \$2.7 million overrun at the end of Increment 3.

The earned value data reported in ERA’s contractor reports are of limited use to the agency in monitoring ERA’s performance and making decisions since they do not provide an accurate depiction of program status. Without data that can provide such insight, NARA will remain unprepared to effectively oversee contractor performance and make realistic projections of cost and schedule for the program.

Conclusions

Overall, NARA has fallen short in its implementation of EVM to oversee and manage the ERA system acquisition. Most of the earned value process controls needed for sound implementation have yet to be fully established. Specifically,

- the baseline for measuring contractor performance lacks sufficient accuracy and completeness to provide a meaningful basis for understanding performance;
- the performance data measured against a flawed baseline are not reliable and are further impaired by the extent of anomalies found in the contractor performance reports; taken together, this hampers NARA's ability to produce reliable estimates of cost at completion; and
- the ability to take timely action to correct unfavorable results and trends is constrained. Moreover, because senior executives do not discuss and use earned value trends to oversee this investment, the production of reliable EVM performance reports will continue to be a low priority to the program office and ultimately the contractor.

Many of the weaknesses found can be traced back to NARA's inadequate agency-level EVM policies, training, and specialized resources, as well as to its acquisition strategy for the ERA program. Until NARA addresses these underlying issues, it is not positioned to optimize EVM as a management tool on this program.

In addition, the program's historical cost and schedule performance suggest that the ERA system, at full operational capability, will likely be deployed at least 67 months behind schedule (in March 2017) and that the total life cycle cost for the program could be at least \$1.2 billion (a 21 percent increase).

Recent changes made to the ERA program, as directed by OMB, could offer a significant opportunity for the agency to move quickly and take aggressive corrective action for this acquisition. However, if NARA does not strike a proper balance between the final revised program plan and its institutional capacity to execute it, then the risk of delivered system functionality not satisfying mission objectives will continue to exist, and our projected cost overruns on this program will likely be realized.

Recommendations for Executive Action

To improve NARA's ability to effectively implement EVM on its ERA system acquisition program, we recommend that the Archivist of the United States direct the NARA CIO to take the following five actions while the current system development contract is active:

- Direct the ERA program to establish a comprehensive baseline (through an integrated master schedule) for all remaining work on contract.
- Ensure that the ERA program obtains reliable EVM performance reports, taking into consideration the data anomalies and weaknesses identified in this report.
- Engage senior NARA and contractor leadership/oversight officials to direct attention to reversing current negative performance trends, as shown in the earned value data, and take action to mitigate the potential cost and schedule overruns.
- Include as part of its acquisition policy governing EVM requirements for (1) EVM training for senior executives and program staff responsible for ERA investment oversight and (2) ongoing surveillance of the ERA program's EVM system to ensure its compliance with industry standards.
- Ensure that the ERA program has the appropriate level of specialized staff in place to perform EVM analysis and oversight activities.

Taking into consideration the new ERA program direction, we further recommend that the Archivist of the United States direct the CIO to take the following three actions:

- Using a gap analysis of the work completed through fiscal year 2011, and the original ERA requirements set, determine and clearly define the remaining work that will be pursued in the future ERA system development phase (Phase 2).
- Direct the ERA program to develop new cost and schedule estimates for a comprehensive Phase 2 baseline, as well as for the total program life cycle. In combination with the above action, this should provide the program with enough information to disclose to the Congress the exact work that will be accomplished and the cost of that work.
- Upon completion of the above action, direct the ERA program to implement the EVM practices that address the detailed weaknesses that we identified in this report, taking into consideration the criteria used, including

-
- establishing a comprehensive Phase 2 baseline (through an integrated master schedule) that has been validated through an integrated baseline review and limits the use of nonobjective metrics;
 - ensuring that reliable reports of EVM performance are being produced, including records of work completed, forecasts of estimates at completion, and explanations/corrective actions for variances and data anomalies; and
 - engaging senior NARA leadership/oversight officials to ensure that earned value data are being used for decision-making purposes, including holding and documenting executive meetings to ensure that cost and schedule risks/issues have been tracked to closure, negative performance trends are mitigated, and major updates made to the baseline have been validated through an integrated baseline review.

Agency Comments and Our Evaluation

In written comments on a draft of this report, which are reprinted in appendix II, the Archivist of the United States generally concurred with our recommendations and stated that NARA plans to address most of them in a near-term action plan. He further stated that NARA would be unable to address the final three recommendations in this plan since those were specific to a future ERA development effort. In addition, the Archivist shared two perspectives regarding our methodology used to project ERA program costs.

First, NARA stated that it believes the true cost of ERA's system development to be only \$282 million, rather than our reported cost of \$567 million, because NARA looks at total costs as two distinct parts: developmental costs versus nondevelopmental costs. Specifically, NARA considers costs such as project management, research and development, concept exploration and planning activities, and operations of the system to be nondevelopmental and thus excludes them from its projections. We disagree that this reflects the true cost of developing the system. True system development cost should include the costs for all program activities performed in the development phase of an acquisition's life cycle, including project management, research and development, concept exploration and planning activities.²² The projections we have made in the report reflect this.

²²[GAO-09-3SP](#).

Second, NARA stated that our cost projections' assumption that past trends are indicative of future performance does not hold true because of its cost category distinction (developmental versus nondevelopmental) and the impact of OMB's July 2010 memo, which redirected the scope of the entire program and ends the current development work in September 2011. NARA further stated that, as a result, the agency cannot know now when new development efforts may start, or the scope or cost of such development. As discussed above, NARA's cost distinction does not provide for a comprehensive estimation of system development costs; therefore, we believe our cost projections are sound. We agree with NARA concerning the impact of the change in program direction and believe the appropriate caveats pertaining to ERA's future were placed on our cost projections in the report. Specifically, our report states that the plans for the completion of the remaining 35 percent of development work are being reevaluated and that our projections were based on the completion of the full ERA system as originally intended.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the appropriate congressional committees, the Archivist of the United States, and other interested parties. The report also will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staff members have questions on matters discussed in this report, please contact David Powner at (202) 512-9286 or pownerd@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix III.



David A. Powner
Director, Information Technology
Management Issues

Appendix I: Objectives, Scope, and Methodology

Our objectives were to (1) assess whether the National Archives and Records Administration (NARA) is adequately using earned value management (EVM) techniques to manage the Electronic Records Archives (ERA) acquisition and (2) evaluate the earned value data to determine ERA's cost and schedule performance.

To accomplish our first objective, we analyzed program documentation, including project work breakdown structures, project schedules, integrated baseline review briefings, risk registers, contractor performance reports, and monthly program management review briefings for the ERA program. Specifically, we compared program documentation with EVM and scheduling best practices as identified in GAO's cost guide.¹ We characterized the extent to which the program met each of the 11 practices as either fully implemented (all sub-elements of the practice were met), partially implemented (some but not all sub-elements were met), or not implemented (none of the sub-elements were met). To have fully implemented a key practice, the program must have implemented all characteristics of the practice. We also interviewed program and contractor officials (and observed program status review meetings) to obtain clarification on how EVM practices are implemented and how the data are used for decision-making purposes.

To accomplish our second objective, we analyzed earned value data contained in contractor EVM performance reports, program budget reports sent to the Office of Management and Budget (OMB), as well as past GAO work on ERA costs and system requirements.² To perform this analysis, we compared the cost of work completed with budgeted costs for scheduled work in the contractor performance reports over an 18-month period to show trends in cost and schedule performances.

We determined that the earned value cost data were not sufficiently reliable to estimate the likely costs at contract completion. As a result, we developed an alternative methodology by using other historical ERA performance data to make cost projections at contract completion, as well as to make further cost and schedule projections about the system development phase beyond the contractor's baseline plan.³ To do so, we

¹[GAO-09-3SP](#).

²[GAO-09-733](#).

³At the direction of OMB, all remaining ERA system development work will be halted in September 2011, and the contract will end at that time.

used our past work to identify the percentage of ERA requirements completed through September 2010. Our alternative methodology was as follows:

- *Completed requirements estimate:* We divided the total number of completed requirements by the duration (in months) it took to complete them to calculate a productivity factor. We then multiplied this factor by the remaining duration of the contract to calculate our estimate of the percentage of requirements that will likely be completed at contract end.
- *Low end of contract completion cost estimate range:* We used the cost overrun incurred to complete the amount of requirements described above by the duration (in months) it took to complete them to calculate a burn rate of overrun dollars. We then multiplied the burn rate by the remaining duration to determine an estimated total overrun beyond what had already been incurred.
- *High end of contract completion cost estimate range:* We divided the current contract value by the total number of completed requirements to calculate an efficiency factor. We then multiplied this factor by our estimate of completed requirements at contract end (calculated as described in the first bullet) to determine our estimate.
- *Development phase schedule estimate:* We used the productivity factor to estimate the duration to complete 100 percent of the requirements (i.e., the development phase).
- *Development phase cost estimate range:* We applied the same general methodology as described above to determine both the low-end and high-end estimates.

To generate our total life cycle cost estimates, we added the NARA-provided cost estimate for operations and maintenance to our estimated development phase costs.

To assess the reliability of the budget cost data, we compared them with other available supporting documents (including financial reports to OMB); performed limited testing of the data to identify obvious problems with completeness or accuracy; and interviewed agency and contractor officials about the data. For the purposes of this report, we determined that the budget cost data were sufficiently reliable. We did not test the adequacy of the agency or contractor cost-accounting systems. Our evaluation of these cost data was based on what we were told by the agency and the information they could provide.

We conducted this performance audit from March 2010 to January 2011 at NARA offices in the Washington, D.C., metropolitan area. Our work was done in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Comments from the National Archives and Records Administration



NATIONAL
ARCHIVES

November 22, 2010

Government Accountability Office
Director of Information Technology Management Issues
Mr. David A. Powner
441 G Street NW
Washington DC, 20548

Dear Mr. Powner:

Thank you for the opportunity to comment on the draft report GAO-11-86, *Electronic Records Archive: National Archives Needs to Strengthen Its Capacity to Use Earned Value Techniques to Manage and Oversee Development*. We appreciate the level of analysis provided and the attention of the audit team to our comments throughout the engagement.

I would like to share two perspectives regarding the methodology that the audit team used to project program cost. Through various interactions with the audit team, we understand how you reached the conclusion that the estimate of the development costs of ERA through September 2011 is \$567 million. We look at this total cost as two distinct parts: developmental costs and non-developmental costs. Non-developmental costs such as project management, research and development, concept exploration and planning activities, and operations of the system, are not included in our projections. Thus we believe the true cost of ERA's system development for this same period is only \$282 million.

Second, the report notes that the projections assume that past trends are indicative of future performance. Normally this would hold true for the Lifecycle cost estimate except for two things: the developmental vs. non-developmental distinction discussed above, and the impact of the OMB "TechStat" memo dated July 2, 2010. This memo redirects the scope of the entire program and ends development at September 30, 2011. This does not spell the end of ERA. We expect that development will be continued at some point in the future based on an assessment of the impact of technological trends on records creation in the Government and NARA's need to address new record formats and to respond to new public access requirements. However, we cannot know now when new development efforts may start, nor the scope or cost of such development.

The report also includes eight recommendations. We generally concur with all, but since the final three are all specific to a future ERA, we will be unable to address them in a near term action plan. If you have any questions regarding this memo or our action plan process, please contact Mary Drak, NARA's Audit Liaison at 301-837-1668 or via email at mary.drak@nara.gov.

David S. Ferriero
Archivist of the United States

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.Appendix III: GAO Contact and Staff Acknowledgments

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Staff Acknowledgments

In addition to the individual named above, those making contributions to this report included Carol Cha, Assistant Director; Neil Doherty; Ronalynn Espedido; Jason Lee; Lee McCracken; Karen Richey; and Niti Tandon.

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