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INFORMATION
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Significant Problems of
Critical Automation
Program Contribute to
Risks Facing 2010 Census

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Highlights of [GAO-08-550T](#), a testimony before the Committee on Homeland Security and Governmental Affairs, U.S. Senate

Why GAO Did This Study

Of the \$11 billion total estimated cost of the 2010 Census, the Census Bureau planned (as of 2007) to spend about \$3 billion on automation and information technology in order to improve census coverage, accuracy, and efficiency. Among other things, the Bureau is planning to automate many of its planned field data collection activities as a way to reduce costs and improve data quality and operational efficiency. Known as Field Data Collection Automation (FDCA), this initiative is acquiring handheld mobile computing devices that, along with other technology, are undergoing operational testing during a Census “Dress Rehearsal” that is taking place from February 2006 to June 2009. The \$600 million FDCA program is a crucial component of the reengineered processes envisioned for the 2010 Census.

In March 2006, GAO reported on the management capabilities of the FDCA program, and in October 2007, it reported on FDCA’s status and plans. As requested, this testimony summarizes key findings from these two reports, as well as subsequent Bureau actions.

What GAO Recommends

In its reports, GAO made several recommendations to improve acquisition management capabilities, including approving baseline requirements for FDCA and strengthening risk management. The Bureau generally agreed with them, but it has not yet fully implemented these and other recommendations.

To view the full product, including the scope and methodology, click on [GAO-08-550T](#). For more information, contact David A. Powner, 202-512-9286, pownerd@gao.gov, or Mathew Scire, 202-512-6806, sciremj@gao.gov.

INFORMATION TECHNOLOGY

Significant Problems of Critical Automation Program Contribute to Risks Facing 2010 Census

What GAO Found

In March 2006, GAO reported that the FDCA project office had not implemented the full set of acquisition management capabilities (such as project and acquisition planning and requirements development and management) that were needed to effectively manage the program. For example, although the project office had developed baseline functional requirements for the acquisition, the Bureau had not yet validated and approved them. Valid baseline requirements are crucial for success, because they are the basis for the detailed operational requirements that determine system development. Without well-defined requirements, system acquisitions are at risk of cost increases, schedule delays, or performance shortfalls. Accordingly, GAO recommended that the Bureau validate and approve baseline requirements for FDCA.

In October 2007, GAO reported that changes to requirements had been a contributing factor to both cost increases and schedule delays experienced by the FDCA program. Increases in the number of requirements led to the need for additional work and staffing. In addition, an initial underestimate of the contract costs caused both cost and schedule revisions. In response to the cost and schedule changes, the Bureau decided to delay certain system functionality, which increased the likelihood that the systems testing at the Dress Rehearsal would not be as comprehensive as planned. In addition, despite reports from Census field staff during spring Dress Rehearsal operations that data transmissions from handheld mobile computing devices were slow and inconsistent, the project team did not adequately identify performance issues with these devices as a risk. The magnitude of the performance difficulties was not clear, and the Bureau had not fully specified how it planned to measure the devices’ performance, as GAO had recommended. Without effective management of these and other key risks, the FDCA program faced an increased probability that the system would not be delivered on schedule and within budget or perform as expected. Accordingly, GAO recommended that the FDCA project team strengthen its risk management activities, including risk identification and oversight.

The Bureau has recently made efforts to further define the requirements for the FDCA program, and it has estimated that the revised requirements will result in significant cost increases. Rough estimates shared with the Congress and the Administration range from \$600 million to \$2 billion; however, specific programs and operations affected have not been identified, nor has the Bureau decided on a clear approach to address these issues. In view of the time frames for the 2010 Census, it is essential that the Bureau act rapidly to make decisions and to implement GAO’s recommendations.



Highlights of [GAO-08-550T](#), a testimony before the Committee on Homeland Security and Governmental Affairs, U.S. Senate

Why GAO Assigns High Risk

GAO audits and evaluations identify federal programs and operations that are high risk due to their greater vulnerabilities to fraud, waste, abuse, and mismanagement. Increasingly, GAO also is identifying high-risk areas to focus on the need for broad-based transformations to address major economy, efficiency, or effectiveness challenges. In January 2007, GAO presented the 110th Congress with the latest status of existing and new high-risk areas warranting attention by both the Congress and the administration. Lasting solutions to high-risk problems could save billions of dollars, dramatically improve service to the public, strengthen confidence and trust in the performance and accountability of the U.S. government, and ensure the ability of government to deliver on its promises. The decennial census is a Constitutionally-mandated activity that produces critical data used to apportion congressional seats and allocate billions of dollars in federal assistance.

What GAO Recommends

In its reports, GAO has recommended that the Bureau improve acquisition management capabilities, operational planning, cost estimation, and performance measurement. The Bureau agreed with most of these recommendations, but has not fully implemented them.

To view the full product, including the scope and methodology, click on [GAO-08-550T](#). For more information, contact Mathew Scire, 202-512-6806, sciremj@gao.gov or David A. Powner, 202-512-9286, pownerd@gao.gov.

2010 CENSUS

Automation Problems and Uncertain Costs and Plans May Jeopardize the Success of the Decennial and Warrant Immediate Attention

Designation as High Risk

Today GAO is designating the 2010 Census as a high-risk area. The Decennial Census is at a critical stage in the 2008 Dress Rehearsal, in which the Bureau has the opportunity to test, for the last time under census-like conditions, its plans for 2010. GAO's work and Census have highlighted a number of long-standing and emerging challenges facing the 2010 Census. Because the census is one of the foundations for many government decisions, threats to a timely and reliable census can affect the public's confidence in government.

GAO has reported long-standing weaknesses in the Bureau's management of information technology. To control costs and improve accuracy, the Bureau is relying as never before on contractor provided technology, including the use of handheld mobile computing devices. In October 2007, GAO concluded that without effective management of key risks, the Field Data Collection Automation (FDCA) program responsible for the devices faced an increased probability that the system would not be delivered on schedule and within budget or perform as expected. GAO recommended that the Bureau strengthen its system testing and risk management activities. Today the Bureau and its contractor are finalizing the FDCA program and have not yet agreed on requirements for FDCA, and system interface testing has been delayed. In the spring of 2007, the Bureau tested the device under census-like conditions for the first time as part of its address canvassing dress rehearsal. Field staff reported technical problems with the handheld devices. The magnitude of these problems is not clear and the Bureau still has not fully specified how it will measure the performance of the handheld devices, as GAO recommended. In addition, the Bureau has not performed recommended analysis or provided sufficient information to provide a level of confidence in its \$11.5 billion life-cycle cost estimate of the decennial census. The Bureau has not itemized the estimated costs of each component operation, conducted sensitivity analysis on cost drivers, or provided an explanation of significant changes in the assumptions on which these costs are based. More recently, the Bureau has delayed the dress rehearsal and dropped several operations. Together, these weaknesses and actions raise serious questions about the Bureau's preparations for conducting the 2010 Census.

In 2005 GAO highlighted the 2010 Census as an emerging area for possible high-risk designation. GAO has recommended numerous corrective actions to address the risks associated with the 2010 Census, but many of them have not been implemented. GAO recommended that the Bureau (1) strengthen its systems testing and risk management activities, (2) define specific measurable performance requirements for the handheld mobile computing device, and (3) develop an integrated and comprehensive plan to control its costs and manage operations.

Mr. Chairman and Members of the Committee:

Thank you for the opportunity to participate in today's hearing to discuss our past work on the Field Data Collection Automation (FDCA) program—a key information technology acquisition that includes systems, equipment, and infrastructure for field staff to use in collecting census data for the 2010 Decennial Census. As you know, the decennial census is mandated by the U.S. Constitution and provides data that are vital to the nation. These data are used to apportion the seats of the U.S. House of Representatives; realign the boundaries of the legislative districts of each state; allocate billions of dollars in federal financial assistance; and provide social, demographic, and economic profiles of the nation's people to guide policy decisions at each level of government.

Carrying out the census is the responsibility of the Department of Commerce's Census Bureau, which is now preparing for the 2010 Census. The next decennial census date is April 1, 2010, and the Secretary of Commerce is required to report to the President the tabulation of total population by states by December 31.¹

The Bureau plans to rely on automation and technology to improve the coverage, accuracy, and efficiency of the 2010 Census. The Bureau estimated that its information technology (IT) acquisitions would account for about \$3 billion of the currently estimated total \$11.5 billion cost of the entire census. It is also holding what it refers to as a Dress Rehearsal, a period centering around a mock Census Day on May 1, 2008. Planned Dress Rehearsal activities include operational testing of the 2010 Census systems in a census-like environment.

The Census Bureau has recently indicated that the FDCA program is likely to incur significant cost overruns. As requested, our testimony today will summarize our past reports on the FDCA program,²

¹13 U.S.C. §§141(a) and (b).

²GAO, *Census Bureau: Important Activities for Improving Management of Key 2010 Decennial Acquisitions Remain to be Done*, [GAO-06-444T](#) (Washington, D.C.: Mar. 1, 2006) and *Information Technology: Census Bureau Needs to Improve Its Risk Management of Decennial Systems*, [GAO-08-79](#) (Washington, D.C.: Oct. 5, 2007).

including our observations on the performance of the FDCA handheld mobile computing devices, which were used during the April 2007 address canvassing activities for the Dress Rehearsal, as well as subsequent Bureau actions. In addition, we will discuss our designation of the 2010 Census as a high-risk program.

The work on which this testimony is based was performed 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.

Results in Brief

We have previously reported on weaknesses in FDCA's IT acquisition management activities.

- In March 2006, we reported that the FDCA project office had not implemented the full set of acquisition management capabilities (such as project and acquisition planning, and requirements development and management) that were needed to effectively manage the program.³ Specifically, the FDCA project had completed most of its solicitation activities, but activities in other management areas had been initiated but not completed. Further, although the project office had developed baseline functional requirements for the acquisition, the Bureau had not yet validated and approved them. Valid baseline requirements are crucial for success, because they are the basis for the detailed operational requirements that determine system development. Without well-defined requirements, system acquisitions are at risk of cost increases, schedule delays, or performance shortfalls. Finally, the project office had identified risks, but it had not yet implemented a risk management process.

³We also reported on the Decennial Response Integration System, which is to provide a system for collecting and integrating census responses from all sources, including forms, telephone interviews, and handheld computing devices in the field.

Until these and other basic management activities were fully implemented, the project faced increased risks that the system would experience cost overruns, schedule delays, and performance shortfalls. We made recommendations to the Director of the Census Bureau to ensure that the project office completed key activities needed to effectively manage its acquisitions, including activities associated with effective requirements management.

- In October 2007, we reported that changes to requirements had been a contributing factor to both schedule delays and cost increases experienced by the FDCA program.⁴ The schedule had been revised—resulting in delays in system development and testing of interfaces—and the life-cycle cost estimates for this program had increased to \$647 million, with additional cost increases anticipated. According to the contractor, the overrun was due primarily to an increase in the number of system requirements. We also reported that the FDCA project team had not adequately identified risks associated with performance issues experienced by handheld mobile computing devices. In May and June 2007, both we and the Census Bureau had observed the use of the handheld mobile computing device in Census-like conditions, which revealed a number of performance issues with the devices, such as slow and inconsistent data processing. The magnitude of these performance issues was not clear. If the project team did not implement key risk management activities, it would face an increased probability that the system would not be delivered on schedule and within budget or perform as expected. To help ensure that the program operates as intended, we recommended that the project team strengthen risk management activities, including those associated with risk identification, mitigation, and oversight. In written comments on a draft of both reports, the department generally agreed with our recommendations for the FDCA project.

The Bureau has recently made efforts to further define the requirements for the FDCA program, and it has estimated that the revised requirements will result in significant cost increases. Rough

⁴[GAO-08-79](#).

estimates that have been shared with the Congress and the Administration range from \$600 million to \$2 billion; however, specific programs and operations affected have not been identified, nor has the Bureau decided on a clear approach to address these issues. In view of the timeframes for the 2010 Census, it is essential that the Bureau act rapidly to make decisions and to implement our previous recommendations.

In 2005 we highlighted the 2010 Census as an emerging area for possible high-risk designation. In addition to the recommendations discussed above, we have recommended other corrective actions to address the risks associated with the 2010 Census, but many of these have not yet been fully implemented. Among these are recommendations that the Bureau strengthen its systems testing, define specific measurable performance requirements for the handheld mobile computing device, and develop an integrated and comprehensive plan to control its costs and manage operations.⁵ More recently, the Bureau has delayed the Dress Rehearsal and dropped several operations, some of which are designed to reach historically undercounted populations and measure census coverage. Together, these concerns raise serious questions about the Bureau's preparations for conducting the 2010 Census. Because the census is one of the foundations for many government decisions, threats to a timely and reliable census can affect the public's confidence in government. We are, therefore, today designating the 2010 Census as high risk.

Background

Conducting the decennial census is a major undertaking involving many interrelated steps, including

- identifying and correcting addresses for all known living quarters in the United States (known as “address canvassing”);

⁵GAO, *2010 Census: Cost and Design Issues Need to be Addressed Soon*, [GAO-04-37](#) (Washington, D.C.: Jan 15, 2004) and *2010 Census: Basic Design Has Potential But Remaining Challenges Need Prompt Resolution*, [GAO-05-9](#) (Washington, D.C. : Jan. 12, 2005).

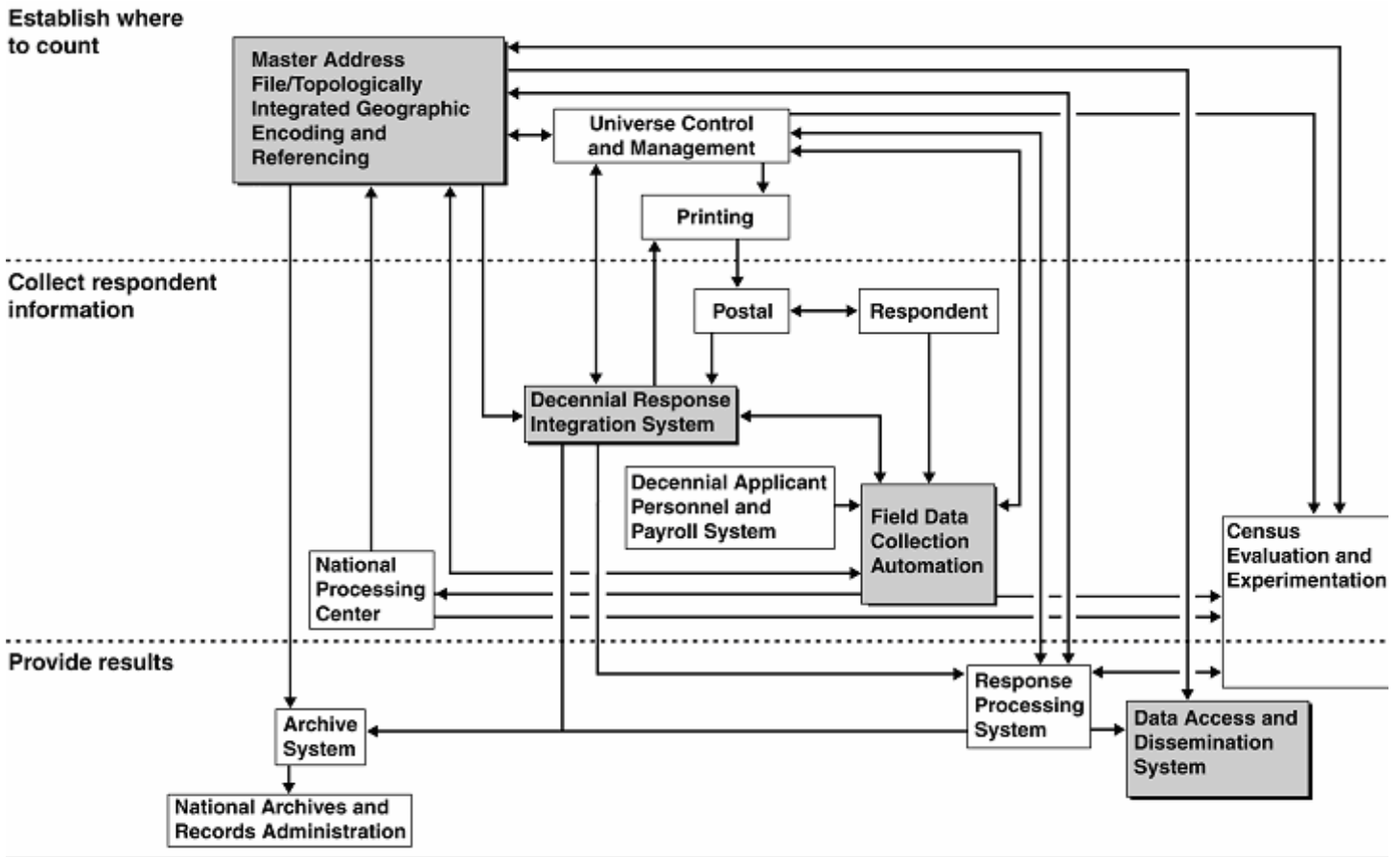
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- sending questionnaires to housing units;
 - following up with nonrespondents through personal interviews;
 - identifying people with nontraditional living arrangements;
 - managing a voluminous workforce responsible for follow-up activities;
 - collecting census data by means of questionnaires, calls, and personal interviews;
 - tabulating and summarizing census data; and
 - disseminating census analytical results to the public.

The decennial census program is the responsibility of the bureau's Decennial Census organization, which is made up of several divisions and offices. In particular, the Decennial Management Division is responsible for implementing the decennial census. The Decennial Systems and Contracts Management Office manages selected system contracts supporting the decennial census including FDCA.

FDCA Plays Crucial Role in the Decennial Census

The Bureau estimated that it would spend about \$3 billion on automation and IT for the 2010 Census to improve coverage, accuracy, and efficiency. Figure 1 shows the key systems and interfaces supporting the 2010 Census.

Figure 1: Key 2010 Census Systems and Interfaces



Source: U.S. Census Bureau.

Note: Shaded boxes indicate major IT decennial systems.

To collect respondent information (a process depicted in the middle section of fig. 1), the Bureau is pursuing the FDCA program. FDCA is expected to provide automation support for field data collection operations, as well as reduce costs and improve data quality and operational efficiency. As the figure shows, the FDCA technology is central to the reengineered processes that are envisioned for the 2010 Census. The acquisition includes the systems, equipment, and infrastructure that field staff will use to collect census data,

including handheld mobile computing devices.⁶ The program is expected to provide office automation for regional and local census offices; the telecommunications infrastructure for headquarters, regional, and local offices; and mobile computing devices for field workers.

The bureau plans to have field-based enumerators use nearly 500,000 mobile computing devices to support decennial census field operations. Enumerators from local census offices will use these mobile computing devices to complete activities including address canvassing (visiting households to update address lists and collect global positioning coordinates to update maps) and conducting nonresponse follow-up (visiting households to obtain information from households that do not provide responses via mail, Internet, or phone).⁷

In preparation for the 2010 Census, the Bureau plans a series of tests of its (new and existing) operations and systems in different environments, as well as to conduct what it refers to as the Dress Rehearsal. During the Dress Rehearsal period, which runs from February 2006 through June 2009, the Bureau plans to conduct development and testing of systems, run a mock Census Day, and prepare for Census 2010, which will include opening offices and hiring staff. These Dress Rehearsal activities are to provide an operational test of the available system functionalities in a census-like environment, as well as other operational and procedural activities.

⁶Handheld mobile computing devices will be used to update the Bureau's address list, to perform follow-up at addresses for which no questionnaire was returned, and to perform activities to measure census coverage.

⁷Further details of mobile computing devices are provided in GAO, *2010 Census: Planning and Testing Activities Are Making Progress*, [GAO-06-465T](#) (Washington, D.C.: Mar. 1, 2006).

Previously Reported Weaknesses in Acquisition Management Activities Increase Risks to Census

In previous reports, we have described weaknesses in FDCA's IT acquisition management activities that pose serious risks to the success of the 2010 Census. In March 2006, we testified that the FDCA project office had not implemented the full set of acquisition management capabilities that were needed to effectively manage the program; we noted in particular that although baseline functional requirements had been developed, they had not been validated and approved.⁸ Subsequently, in October 2007, we reported that changes to requirements had been a contributing factor to both schedule delays and cost increases experienced by the FDCA program.⁹ Further, although the FDCA project team had performed many practices associated with establishing sound and capable risk management processes, critical weaknesses remained. For example, despite reports of performance issues with handheld mobile computing devices, the project team did not adequately identify these as a risk.

The FDCA Program Had Not Initiated Key Management Activities

In March 2006, we reported that the FDCA project office had initiated many key processes to oversee and manage the program, but had not yet implemented the full set of acquisition management capabilities it needed to fully manage the acquisition. Table 1 provides a summary of the status of the FDCA project in each of the process areas we evaluated.

⁸[GAO-06-444T](#).

⁹[GAO-08-79](#).

Table 1: Summary of the Status of FDCA Acquisition Management Capabilities as of March 2006

Capability	Status
Project and acquisition planning	Initiated, but key activities remained to be completed, such as identifying deliverables and milestones, and obtaining stakeholder buy-in on a project plan that included the project's estimated costs, budget, and schedules.
Solicitation	Key activities completed; bureau officials said that they were on schedule to award the contract in March 2006.
Requirements development and management	Initiated, but key activities remained to be completed, such as validating requirements.
Risk management	Initiated, but key activities remained to be performed, such as assigning responsibilities for risks and preparing mitigation plans.
Contract tracking and oversight/project monitoring and control	Initiated, but key performance measures had not yet been established; bureau officials said that they expected to define these metrics after contract award.
Process and product quality assurance	Initiated; the quality assurance process was expected to be implemented after contract award.
Executive oversight/governance	Initiated, but key governance activities remained to be completed.

Source: GAO analysis.

The FDCA project office had made some progress in building management capabilities, but more remained to be done in key areas. For example, the project office completed many key solicitation activities and planned to award a contract in March 2006. In the requirements development and management area, the project office and the Decennial Management Division developed some FDCA-specific functional requirements with participation from stakeholders. The office had also drafted a requirements management plan. However, the division had not yet validated and approved a baseline set of operational requirements nor ensured traceability between its operational requirements and the FDCA request for proposals. Until the bureau finalized its operational requirements for the census and ensured that the FDCA request for proposal was consistent with the baseline requirements, the project would be at risk of having changes to the requirements, potentially affecting its ambitious development and implementation schedule.

Additionally, in the contract and project monitoring area, the project office had initiated efforts to oversee the contractor's performance, such as requiring earned value management reporting and hiring

staff with contract tracking and oversight experience. However, the project office had not yet selected detailed performance measures for tracking the contractor or its own internal progress (such as progress against planned milestones, number of risks opened and closed, number and frequency of changes to requirements, and frequency of quality assurance reviews). Without such practices in place, the project team would not be able to ensure that it could identify problems and take appropriate corrective actions in a timely manner.

We said that sound acquisition and management processes were needed to minimize risks and thereby maximize chances for success. Such processes have been identified and endorsed by such leading organizations as the Software Engineering Institute and the Chief Information Officers' Council, as well as in our prior work analyzing best practices in industry and government. Our work has shown that such processes are significant factors in successful systems acquisitions and development programs, and they improve the likelihood of meeting cost and schedule estimates as well as performance.

To ensure that the bureau adequately managed the FDCA project, we recommended that the Director of the Census Bureau direct the project office to take four actions, including validating and approving baseline requirements. The Bureau generally agreed with our recommendations and stated that time constraints and budgets had driven it to proceed with its acquisitions before all the recommended activities had been completed.

The FDCA Program Had Delayed Functionality and Was Experiencing Cost Increases

As of October 2007, we reported that FDCA had experienced schedule delays and cost increases. Specifically, the life cycle cost estimates for this program had increased to \$647 million, and additional cost increases were anticipated. In response to schedule delays as well as other factors, including cost, the Bureau made schedule adjustments and planned to delay certain system functionality. As a result of the FDCA schedule changes, the likelihood had increased that the systems testing at the Dress Rehearsal would not be as comprehensive as planned.

In October 2007, we reported that the contractor was in the process of developing and testing FDCA software for the Dress Rehearsal Census Day, and had delivered 1,388 handheld mobile computing devices to be used in address canvassing¹⁰ for the Dress Rehearsal. Also, key FDCA support infrastructure had been installed, including the Security Operation Center. In future contract phases, the project was to continue development, deploy systems and hardware, support census operations, and perform operational and contract closeout activities.

However, the Bureau revised FDCA's original schedule and delayed or eliminated some of its key functionality from the Dress Rehearsal, including the automated software distribution system. According to the Bureau, it revised the schedule because it realized that it had underestimated the costs for the early stages of the contract, and that it could not meet the contractor's estimated level of first-year funding because the fiscal year 2006 budget was already in place. According to the Bureau, this initial underestimate led to schedule changes and overall cost increases.

In particular, the project life-cycle costs had increased. At contract award in March 2006, the total cost of FDCA was estimated not to exceed \$596 million. As of September 2006, the cost estimate had increased to \$624 million. In May 2007, the life-cycle cost rose by a further \$23 million because of increasing system requirements, which resulted in an estimated life-cycle cost of about \$647 million. Table 2 shows the life-cycle cost estimates for FDCA as of October 2007.

¹⁰Address canvassing is a field operation to build a complete and accurate address list. In this operation, census field workers go door to door verifying and correcting addresses for all households and street features contained on decennial maps.

Table 2: FDCA Life-Cycle Cost Estimates as of October 2007

Execution period	Start date	End date	Cost estimates (in millions)	
			September 2006	May 2007
Baseline planning period	March 31, 2006	June 30, 2006	\$11	\$11
Execution Period 1	July 1, 2006	December 31, 2008	200	225
Execution Period 2	January 1, 2009	September 30, 2011	319	318
Execution Period 3	August 1, 2010	End of contract	10	10
Leased equipment	N/A	N/A	12	12
Management reserve	N/A	N/A	7	5
Award fee	N/A	N/A	65	65
Total			\$624	\$647

Source: GAO analysis of Census Bureau data.

Note: Total may not add due to rounding.

In addition, FDCA had already experienced \$6 million in cost overruns, and both our analysis and the contractor's analysis expected FDCA to experience additional cost overruns. Based on our analysis of cost performance reports (from July 2006 to May 2007), we projected that the FDCA project would experience further cost overruns by December 2008.

According to the contractor, the major cause of projected cost overruns was the system requirements definition process. For example, in December 2006, the contractor noted a significant increase in the requirements for the Dress Rehearsal Paper Based Operations in Execution Period 1. According to the cost performance reports, this increase meant that more work had to be conducted and more staffing assigned to meet the Dress Rehearsal schedule.

The Bureau agreed that cost increases occurred in some cases because of the addition of new requirements, most of which related to the security of IT systems, but added that in other cases, increases occurred from the process of the contractor converting high-level functional requirements into more detailed specific requirements. However, the process of developing detailed requirements from high-level functional requirements does not

inevitably lead to cost increases if the functional requirements were initially well-defined.

We reported that the FDCA schedule changes had increased the likelihood that the systems testing at the Dress Rehearsal would not be as comprehensive as planned. The inability to perform comprehensive operational testing of all interrelated systems increases the risk that further cost overruns will occur and that decennial systems will experience performance shortfalls.

The FDCA Project Team Was Making Progress in Risk Management Activities, but Critical Weaknesses Remained

According to the Software Engineering Institute (SEI), the purpose of risk management is to identify potential problems before they occur. When problems are identified, risk-handling activities can be planned and invoked as needed across the life of a project in order to mitigate adverse impacts on objectives. Effective risk management involves early and aggressive risk identification through the collaboration and involvement of relevant stakeholders. Based on SEI's Capability Maturity Model[®] Integration (CMMI[®]), risk management activities can be divided into four key areas:

- preparing for risk management,
- identifying and analyzing risks,
- mitigating risks, and
- executive oversight.

The discipline of risk management is important to help ensure that projects are delivered on time, within budget, and with the promised functionality. It is especially important for the 2010 Census, given the established timeframe.

In October 2007, we reported that the FDCA project had made progress in implementing risk management practices, but some weaknesses remained. For example, the project team had developed strategies to identify the scope of the risk management effort. However, the project team had weaknesses in identifying risks,

establishing adequate mitigation plans, and reporting risk status to executive-level officials. These weaknesses in completing key risk management activities can be attributed in part to the absence of Bureau policies for managing major acquisitions, as we described in earlier reports.¹¹ Without effective risk management practices, the likelihood of project success is decreased.

Weaknesses in identifying risks. As of July 2007, the FDCA project team had not identified or documented any significant risks related to the handheld computers that will be used in the 2010 Census, despite problems arising during the Dress Rehearsal. The computers are designed to automate operations for field staff and eliminate the need to print millions of paper questionnaires and maps used by temporary field staff to conduct address canvassing and nonresponse follow-up. Automating operations may allow the Bureau to reduce the cost of operations; thus, it is critical that the risks surrounding the use of the handheld computers be closely monitored and effectively managed to ensure their success.

However, the Bureau had not identified or documented risks associated with a variety of handheld computers' performance problems that we identified through field work.¹² Specifically, we found that during Dress Rehearsal activities between May 2007 and June 2007, as the Bureau tested a prototype of the handheld computers, field staff experienced multiple problems. For example, the field staff told us that they experienced slow and inconsistent data transmissions from the handheld computers to the central data processing center. The field staff reported that the device was slow to process addresses that were a part of a large assignment area.¹³

¹¹GAO, *Information Technology Management: Census Bureau Has Implemented Many Key Practices, but Additional Actions Are Needed*, [GAO-05-661](#) (Washington, D.C.: June 16, 2005) and *Census Bureau: Important Activities for Improving Management of Key 2010 Decennial Acquisitions Remain to be Done*, [GAO-06-444T](#) (Washington, D.C.: Mar. 1, 2006).

¹²We testified on the preliminary results from this field work, as well as the results of our October report, in GAO, *Information Technology: Census Bureau Needs to Improve Its Risk Management of Decennial Systems*, [GAO-08-259T](#) (Washington, D.C.: Dec. 11, 2007).

¹³A small geographic area, usually a block or group of blocks, established by the Census Bureau as a basic unit for data collection by a single enumerator, lister, or other field staff.

Bureau staff reported similar problems with the handheld computers in observation reports, help desk calls, and debriefing reports. In addition, a time and motion study conducted by the Census Bureau indicated that field staff reported significant downtime in two test locations—about 23 percent in one location and about 27 percent in another location. The study also described occurrences of failed transmissions and field staff attempts to resolve transmission problems.

Collectively, the observation reports, help desk calls, debriefing reports, and time-and-motion study raised serious questions about the performance of the handheld computers during the address canvassing operation. According to the Bureau, the contractor used these indicators to identify and address underlying problems during the Dress Rehearsal. Still, the magnitude of the handheld computers' performance issues throughout the Dress Rehearsal was not clear. For example, the Bureau received analyses from the contractor on average transmission times. However, the contractor had not provided analyses that show the full range of transmission times, nor how this might have changed throughout the whole operation.

In addition, the Bureau has not fully specified how it will measure performance of the handheld computers, even though the FDCA contract anticipates the Bureau's need for data on the performance of the handheld computers. The FDCA program outlines the type of data the contractor is to provide the Bureau on the performance of the handheld computers. Specifically, sections of the FDCA contract require the handheld computers to have a transmission log showing what was transmitted, the date, time, user, destination, content/data type, and the outcome status. Another section of the Bureau's FDCA contract states that the FDCA contractor shall provide near real time reporting and monitoring of performance metrics and a "control panel/dash board" application to visually report those metrics from any Internet-enabled computer. However, the contractor and the Bureau are not using a dashboard for Dress Rehearsal activities. Rather, during the Dress Rehearsal, the Bureau plans to identify what data and performance it would need for tracking the performance of the handheld computers in 2010 operations.

In order for the Bureau to ensure that the FDCA handheld computers are ready for full scale operations, it will have to be able to measure performance. We recommended in a report on the Bureau's earlier version of the handheld computers that the Bureau define specific, measurable performance requirements for the handheld computer and other census-taking activities that address such important measures as productivity, cost savings, reliability, and durability, and that the Bureau test the device's ability to meet those requirements in 2006.¹⁴ We also recommended in a March 2006 testimony that the Bureau validate and approve FDCA baseline requirements.¹⁵ To get these things done, the Bureau must work within a time frame that has now been compressed. By law, the decennial census date is April 1, 2010, and the results must be submitted to the President in December 2010. Access to real-time performance metrics via a "control panel/dash board" would assist Bureau management in assessing the handheld computer's performance and maximize the amount of time the Bureau and the contractor would have to remedy any problems that are identified during any operations.

Further, the Bureau's tight 2010 decennial operations schedule allows little time for fixing problems with the device, raising the importance of the Bureau's access to these performance indicators. Such data would help fully inform stakeholders of the risks associated with the handheld computer and allow project teams to develop mitigation activities to help avoid, reduce, and control the probability of these risks occurring.

Finally, the FDCA project team did not provide evidence that specific system interface risks were being adequately identified to ensure that risk handling activities would be invoked should the systems fail during the 2010 Census. If risks are not adequately identified and analyzed, management may be prevented from monitoring and tracking risks and taking the appropriate mitigation

¹⁴GAO, *2010 Census: Basic Design Has Potential, but Remaining Challenges Need Prompt Resolution*, [GAO-05-9](#) (Washington, D.C.: Jan.12, 2005).

¹⁵[GAO-06-444T](#).

actions, increasing the probability that the risks will materialize and magnifying the extent of damage incurred in such an event.

Weaknesses in establishing adequate mitigation plans. The FDCA project team had developed mitigation plans that were often untimely or included incomplete activities and milestones for addressing the risks. For example, the FDCA project team had developed mitigation plans for the most significant risks, but the plans did not always identify milestones for implementing mitigation activities. Moreover, the plans did not identify any commitment of resources, several did not establish a period of performance, and the team did not always update the plans with the latest information on the status of the risk. In addition, the FDCA project team did not provide evidence of developing mitigation plans to handle the other significant risks as described in its risk mitigation strategy. (These risks included a lack of consistency in requirements definition and insufficient FDCA project office staffing levels).

Further, the project team did not always implement the mitigation plans as appropriate. For example, the project team did not identify system interface risks nor prepare adequate mitigation plans to ensure that systems would operate as intended. Because they did not develop complete mitigation plans, the project team could not ensure that for a given risk, techniques and methods would be invoked to avoid, reduce, and control the probability of occurrence.

Weaknesses in reporting risk status to executive-level officials. Reviews of the project teams' risk management activities, status, and results should be held on a periodic and event-driven basis. The reviews should include appropriate levels of management, such as key Bureau executives, who can provide visibility into the potential for project risk exposure and appropriate corrective actions. The FDCA project team did not provide sufficient evidence to document that the status of risks was discussed with executive-level officials or what the discussions covered. Failure to report a project's risks to executive-level officials reduces the visibility of risks to executives who should be playing a role in mitigating them.

To strengthen the FDCA program risk management activities, we recommended that the Director of the Census Bureau ensure that

the project teams, including FDCA, implement actions to address weaknesses in risk management. The Bureau generally agreed with our recommendations, but disagreed with our assessment with regard to risk identification, pointing out that the FDCA project identified risks associated with handheld mobile computing devices and assigned responsibility to the contractors. In addition, the Bureau said that it had identified risks related to system interfaces. However, the project did not identify significant risks for the project office to monitor and track related to problems arising during the address canvassing component of the Dress Rehearsal. Also, although this project identified a general risk related to system interfaces, it did not identify specific risks related to particular interfaces.

In June 2007, an independent assessment of the FDCA program reported on requirements management problems similar to those we reported in March 2006. Specifically, the study reported that the contractor is overwhelmed by a substantial increase in requirements, having thousands of unreconciled (that is, not validated) requirements. According to the study, reconciliation of requirements was impeded by many factors, including the number of requirements and lack of agreement among stakeholders on what to include in requirements. Similar to our recommendation in the March 2006 report, the study recommended that the Bureau immediately stabilize requirements by defining and refining them.

The Bureau has recently made efforts to further define the requirements for the FDCA program, and it has estimated that the revised requirements will result in significant cost increases. Rough estimates that have been shared with the Congress and the Administration range from \$600 million to \$2 billion; however, specific programs and operations affected have not been identified, nor has the Bureau decided on a clear approach to address these issues.

2010 Census Is at Risk

The Decennial Census is at a critical stage in the 2008 Dress Rehearsal, in which the Bureau has the opportunity to test, for the

last time, its plans for 2010. Our work, over the years, and the Bureau itself have highlighted a number of challenges facing the 2010 Census. These include (as discussed above) weaknesses in the Bureau's IT acquisition management capabilities and risks associated with the performance of the handheld mobile computing device. In addition to these challenges, concerns have been raised in two other areas: the uncertainty over the ultimate cost of the 2010 Census and the elimination of several operations from the 2008 Dress Rehearsal:

- The Bureau has not performed the analysis or provided sufficient information to provide a level of confidence in its \$11.5 billion life-cycle cost estimate of the decennial census. The Bureau has not itemized the estimated costs of each component operation, conducted a sensitivity analysis on cost drivers, or provided an explanation of significant changes in the assumptions on which these costs are based.
- The Dress Rehearsal, designed to be a dry run of the census, is the Bureau's last opportunity to ensure that all the various operations and systems are in sync before the 2010 Census. However, the Bureau has delayed the dress rehearsal and dropped several operations, including operations that are designed to reach populations that are typically undercounted, measure census coverage, and enumerate people living in rural areas. Although the Bureau has carried out these operations before, in some cases they now involve new procedures and system interfaces that, as a result of their exclusion, will not be tested under census-like conditions. Further, end-to-end testing of the various IT systems will not be performed under census-like conditions because such testing will not occur during the Dress Rehearsal.

Given its size and complexity, the Census presents significant risks, and implementing our recommendations would help the Bureau effectively manage the myriad interrelated operations needed to ensure an accurate and complete count in 2010. The success of this effort is put in jeopardy by the risks discussed above. Managing these risks is critical to the timely completion of a reliable and cost-effective census.

We have recommended numerous corrective actions to address the risks associated with the 2010 Census, but many of them have not been implemented. Besides those already discussed, in January 2004 we made recommendations that the Bureau control the costs of the census and develop an integrated and comprehensive plan to manage operations.¹⁶ Specifically, to understand and manage the assumptions that drive the cost of the Decennial Census, we asked the Bureau to annually update the cost of the 2010 Census and conduct sensitivity analysis on the \$11.5 billion estimate. However, while the Bureau understands the utility of sensitivity analysis, it has not conducted such analysis. To effectively manage operations, we recommended that the Bureau develop a comprehensive, integrated project plan for the 2010 Census. In response, the Bureau developed a 2010 Census Operations and Systems Plan. This document includes inputs and outputs and describes linkages among operations and systems. However, it does not yet include a risk mitigation plan, a detailed 2010 Census timeline, and the cost for each operation.

In 2005, we highlighted the 2010 Census as an emerging area to be monitored for possible high-risk designation, and in 2006, we listed it as a key oversight issue for the 110th Congress.¹⁷ To determine whether the 2010 Census is high risk, we have considered a set of quantitative and qualitative factors.¹⁸ Those factors relevant to the 2010 Census include whether the investment is large, exceeding \$1 billion; whether the risk is detrimental to service delivery and citizens' rights; and whether the risk could result in unreliable decision-making data and a reduced confidence in government. Based on our work, the 2010 Census meets those criteria. As noted above, the decennial census is a large investment, and there is a potential risk for an incomplete or inaccurate census, which would be detrimental to the administration of federal financial assistance

¹⁶GAO, *2010 Census: Cost and Design Issues Need to Be Addressed Soon*, [GAO-04-37](#) (Washington, D.C.: Jan. 15, 2004).

¹⁷GAO, *Suggested Areas for Oversight for the 110th Congress*, [GAO-07-235R](#) (Washington, D.C.: November 2006).

¹⁸GAO, *Determining Performance and Accountability Challenges and High Risks*, [GAO-01-159SP](#) (Washington, D.C.: November 2007).

for government programs and to the enforcement, for example, of citizens' rights under the Voting Rights Act. Furthermore, because the census is a foundation for elected government, threats to a timely and reliable census can affect the public's confidence in government. We are therefore designating the 2010 Census as high risk.

In summary, the FDCA program was expected to support the goal of a reengineered 2010 Decennial Census to reduce costs and improve data quality and operational efficiency. Because the Bureau did not validate and approve the FDCA program requirements, it faces a crisis, including increased costs and schedule delays. In this emergency, the Bureau will have to make quick decisions to ensure that the project can achieve its purpose. Continued attention by this Committee, Commerce, the Bureau, us, and others will be essential to helping ensure a cost-effective and efficient 2010 census.

Mr. Chairman and members of the committee, this concludes our statement. We would be happy to respond to any questions that you or members of the committee may have at this time.

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