Testimony

Before the Subcommittee on Oversight and Management Efficiency, Committee on Homeland Security, House of Representatives

For Release on Delivery
Expected at 9:30 a.m. ET
Thursday, March 16, 2017

IMMIGRATION BENEFITS SYSTEM

Significant Risks in USCIS's Efforts to Develop its Adjudication and Case Management System

Statement of Carol C. Harris, Director Information Technology Acquisition Management Issues

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Why GAO Did This Study

Each year, USCIS processes millions of applications from foreign nationals seeking to study, work, visit, or live in the United States, and for persons seeking to become U.S. citizens. In 2006, USCIS began the Transformation Program to enable electronic adjudication and case management tools that would allow users to apply and track their applications online.

It is essential that USCIS deploy a seamless electronic system to help ensure the integrity of the immigration process. Such a system should allow the agency to more accurately process immigration and citizenship benefits in a timely manner and identify fraudulent and criminal activity.

This statement summarizes GAO's most recent reports on USCIS's Transformation Program. These reports focus on cost increases and schedule delays and program management challenges that have contributed to increasing risks to the new system. GAO identified the program as one of ten federal high-risk investments in need of attention in 2015.

What GAO Recommends

In its prior reports, GAO made 30 recommendations to address weaknesses in the management and acquisition of the Transformation Program. USCIS concurred and has fully addressed 17 of the 30 recommendations to date.

What GAO Found

The U.S. Citizenship and Immigration Services' (USCIS) most recent cost and schedule baseline, approved in April 2015, indicates that its Transformation Program will cost up to $3.1 billion and be fully deployed no later than March 2019. This is an increase of approximately $1 billion with a delay of more than 4 years from its initial July 2011 acquisition program baseline. In addition, the program is currently working to develop a new cost and schedule baseline to reflect further delays. Due to the program's recurring schedule delays, USCIS will continue to incur costs for maintaining its existing systems while the program awaits full implementation. Moreover, USCIS's ability to achieve program goals, including enhanced national security, better customer service, and operational efficiency improvements, will be delayed.

Recurring delays are partly the result of challenges in program management. In July 2016, GAO reported that the USCIS Transformation Program had fully addressed some, and partially addressed many other key practices for implementing software development, conducting systems integration and testing, and monitoring the largest program contractors. Nevertheless, GAO reported that the program inconsistently adhered to these practices. For example,

- The program had established an environment and procedures for continuously integrating functionality and was conducting various tests and inspections of new software code. However, the program was not consistently adhering to its policies and guidance or meeting stated benchmarks for testing and inspections.
- The program had reported experiencing issues such as production defects and bugs in the system as a result of deploying software that had not been fully tested.
- The program had mixed success in monitoring its contractors for six contracts that GAO reviewed. For example, a development services contract contained appropriate performance criteria that linked to the program goals, but the program did not clearly define measures against which to analyze differences between services expected and those delivered.
- Its software development approach deviated from key practices in part because USCIS policy and guidance were not being updated.

Given the history of development for the Transformation Program and the subsequent commitment of additional resources for a new system, it is more important than ever that USCIS consistently follow key practices in its system development efforts. For example, the program has already reported realizing risks associated with deploying software that has not been fully tested, such as system bugs, defects, and unplanned network outages. If the agency does not address the issues GAO has identified in prior work, then it will continue to experience significant risk for increased costs, further schedule delays, and performance shortfalls.

Chairman Perry, Ranking Member Correa, and Members of the Subcommittee:

I am pleased to be here today to discuss the challenges that U.S. Citizenship and Immigration Services (USCIS) has had in developing an electronic system to support and modernize the filing and processing of immigration and citizenship applications. As you know, each year, USCIS, an agency within the Department of Homeland Security (DHS), processes millions of mostly paper-based applications and petitions for more than 50 types of immigrant and nonimmigrant-related benefits. Having a seamless electronic system would assist the agency in accurately processing immigration and citizenship benefits in a timely manner to eligible applicants. Such a system would also assist in denying benefits to those who are ineligible. In addition, the system could help USCIS identify fraudulent and criminal activity, essential for ensuring the integrity of the immigration process.

We have long recognized the need to improve the USCIS benefits application and adjudication processes and underlying technology infrastructure.[1] For example, in May 2001, we reported that some applications and petitions—benefit applications—took 2 years or longer to process.[2] This lengthy process resulted in backlogs of pending applications. More recently, in September 2016, we reported that USCIS was unable to comprehensively identify and address fraud trends across the immigrant investor program in part because of its reliance on paper-based documentation and limitations with using and collecting that data for the program.[3] According to an official from USCIS's Fraud Detection and National Security Directorate, this supporting data could be an important source for fraud indicators.

In 2006, USCIS embarked on a major initiative, the Transformation Program, to address processing inefficiencies and transform its current paper-based system into an electronic account-based system. This system was expected to incorporate electronic adjudication and account-

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[1]See appendix I for related GAO products.

[2]GAO, *Immigration Benefits: Several Factors Impede Timeliness of Application Processing*, GAO-01-488 (Washington, D.C.: May 4, 2001).

[3]GAO, *Immigrant Investor Program: Progress Made to Detect and Prevent Fraud, but Additional Actions Could Further Agency Efforts*, GAO-16-828 (Washington, D.C.: Sept. 13, 2016).

based case management tools, including tools that would allow applicants to apply online for benefits. However, since its inception, we have reported that the program has continually faced management and development challenges, limiting its progress and ability to achieve its goals of enhanced national security and system integrity, better customer service, and operational efficiency.[4] Over the last 10 fiscal years, we have made 30 recommendations to address weaknesses in the program's acquisitions and operations. USCIS has fully addressed 17 of these 30 recommendations.[5] Based in part on our concerns about the Transformation Program, we identified it as one of ten investments in need of the most attention when we designated managing information technology (IT) acquisitions and operations across the federal government as high risk in 2015.[6]

My testimony today will focus on Transformation Program cost increases and schedule delays and program management challenges that have contributed to increasing risks to the new system. In developing this testimony, we relied on our previous reports, as well as information provided by the department on its actions in response to our previous recommendations and ongoing work. A more detailed discussion of the objectives, scope, and methodology for this work is included in each of the reports that are cited throughout this statement.

All of the work on which this statement is based was conducted in accordance with generally accepted government auditing standards.[7] Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our

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[4]GAO, *USCIS Transformation: Improvements to Performance, Human Capital, and Information Technology Management Needed as Modernization Proceeds,* GAO-07-1013R (Washington, D.C.: July 17, 2007); *Immigration Benefits: Consistent Adherence to DHS's Acquisition Policy Could Help Improve Transformation Program Outcomes,* GAO-12-66 (Washington, D.C.: Nov. 22, 2011); *Immigration Benefits System: Better Informed Decision Making Needed on Transformation Program,* GAO-15-415 (Washington, D.C.: May 18, 2015); *Immigration Benefits System: U.S. Citizenship and Immigration Services Can Improve Program Management,* GAO-16-467 (Washington, D.C.: July 7, 2016).

[5]See appendix II for the status of prior recommendations.

[6]GAO, *High-Risk Series: An Update,* GAO-15-290 (Washington, D.C.: Feb. 11, 2015).

[7]A more detailed discussion of the objectives, scope, and methodology of this work is included in each of the reports that are cited throughout this statement. See appendix I for related GAO products.

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.

Background

The goals of the Transformation Program are to modernize the paper-based immigration benefits process, enhance national security and system integrity, and improve customer service and operational efficiency. Established in 2006, the program comprises many systems, each of which provides a service to facilitate operations, such as identity management and risk and fraud analytics. The objectives of the Transformation Program are to allow

- applicants to establish an account with USCIS to file and track the status of the application, petition, or request online;

- the USCIS Electronic Immigration System (USCIS ELIS), which is the main component of the program, to apply risk-based rules automatically to incoming applications, petitions, and requests to identify potentially fraudulent applications and national security risks;

- adjudicators to have electronic access to applications, petitions, and requests, relevant policies and procedures, and external databases;

- USCIS to have management information to track and allocate workload; and

- USCIS ELIS to have electronic linkages to other agencies, such as the Departments of Justice and State, for data sharing and security purposes.

As the main component of the program, USCIS ELIS is to provide case management for adjudicating immigration benefits. USCIS ELIS relies on and interfaces with other systems that provide additional capabilities, such as user authentication and scheduling, to deliver end-to-end processing. In particular, as of July 2016, the system was expected to interface with at least 30 other systems, ranging in function from fraud detection to law enforcement and to online payment.

The program expects to achieve its goals and objectives through the delivery of five core operating requirements. These core requirements, which are expected to collectively deliver the program's mission needs, are (1) intake and account management; (2) benefits case management; (3) electronic content management; (4) agency and knowledge management; and (5) risk and fraud management. Table 1 describes the five core operational requirements.

Table 1: USCIS ELIS's Five Core Operational Requirements

Core operational requirement	Description
Intake and Account Management	Enable electronic submission of completed applications and fee payments. Enable benefit requests submitted by paper to be electronically transferred to USCIS ELIS for subsequent processing.
Benefits Case Management	Enable electronic application tracking, and facilitate adjudication of immigration benefits.
Electronic Content Management	Enable digitizing, managing, and sharing electronic content. Includes the feature for establishing and managing document libraries that support external customer needs.
Agency and Knowledge Management	Enable the alignment of resources and tools to facilitate adjudication and supporting processes. Includes features for generating management reports and facilitating the management of fees and customer inquiries.
Risk and Fraud Management	Provide the features that send, receive, and consolidate information required for processing and assessing background checks based on biographic and biometric information and support improvements for identifying potential fraud and national security.

Source: GAO analysis of USCIS documentation. | GAO-17-486T

Program Governance and Oversight

The USCIS Transformation Program is governed by multiple bodies within DHS and the program. Specifically, DHS governance bodies, such as the Acquisition Review Board and Executive Steering Committee, evaluate cost, schedule, and performance of a program and provide corrective actions when needed. In addition, the department's Office of the Chief Information Officer and Office of Program Accountability and Risk Management conduct oversight of individual programs, which in turn, informs congressional and Office of Management and Budget oversight. For example, the Office of Program Accountability and Risk Management develops periodic reports to ensure that various DHS programs and their components within the agency satisfy compliance-related mandates and improve investment management. In addition, the Office of the Chief Information Officer performs periodic reviews that serve as the basis for publicly reported program ratings.[8]

Within USCIS, directorates govern divisions and program offices govern specific functions, such as the Transformation Program. One program office, the Office of Transformation Coordination, has managed and

[8]These ratings are published on the Federal IT Dashboard. In June 2009, OMB deployed a public website known as the IT Dashboard to improve the transparency and oversight of agencies' IT investments. The IT Dashboard displays federal agencies' cost, schedule, and performance data for major federal IT investments at federal agencies. For each major investment, the Dashboard provides performance ratings on cost and schedule, a chief information officer evaluation, and an overall rating, which is based on the cost, schedule, and ratings.

overseen the development of USCIS ELIS. Other USCIS directorates and program offices, including the Office of Information Technology and the Customer Service and Public Engagement directorate, have supported the management and oversight of the larger USCIS Transformation Program.

Software Development Approach

In April 2015, USCIS officially changed its software development approach. In particular, USCIS transitioned from a waterfall approach to develop, test, and deliver USCIS ELIS functionality[9] to an incremental approach. In an incremental approach, software is developed, tested, and delivered in smaller components or phases, rather than in the typically long, sequential phases of a traditional waterfall approach. Incremental software development is consistent with the Office of Management and Budget's IT Reform Plan[10] and the law commonly referred to as the Federal Information Technology Acquisition Reform Act (FITARA).[11] The incremental approach chosen by USCIS, called Agile, is intended to allow subject matter experts to validate requirements, processes, and system functionality in increments, and deliver the functionality to users in short cycles.

Transformation Program Has Experienced Significant Cost Increases and Schedule Delays

Since USCIS began implementation of the Transformation Program in 2006, the effort has experienced significant cost increases and schedule delays. In particular, the program's most recent baseline, approved in April 2015, indicates that the Transformation Program will cost up to $3.1 billion and be fully deployed no later than March 2019. This is an increase of approximately $1 billion with a delay of more than 4 years from its initial July 2011 acquisition program baseline. In November 2008, USCIS awarded a solutions architect contract for approximately $500 million over a 5-year period to design, develop, test, deploy, and sustain the Transformation Program by November 2013. In July 2011, DHS officially approved the Transformation Program's acquisition program baseline and

[9]Waterfall development is an approach that uses long, sequential phases, resulting in product delivery years after program initiation.

[10]Office of Management and Budget, *25 Point Implementation Plan to Reform Federal Information Technology Management* (Washington, D.C.: Dec. 9, 2010).

[11]40 U.S.C. § 11319(b)(1)(B)(ii). *The Federal Information Technology Acquisition Reform provisions of the Carl Levin and Howard P. 'Buck' McKeon National Defense Authorization Act for Fiscal Year 2015*, Pub. L. No. 113-291, div. A, title VIII, subtitle D, 128 Stat. 3292, 3438-3450 (Dec. 19, 2014).

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supporting operational requirements. This baseline estimate was for about $2.1 billion and the program was projected to reach full operating capability no later than June 2014.

In May 2012, USCIS launched the first release of USCIS ELIS. This release included capabilities associated with all of the system's core operational requirements, such as online account setup, case management, case acceptance, applicant evidence intake, and notice generation. Subsequent to this first release, USCIS deployed additional releases to add functionality. This initial USCIS ELIS[12] was used to process nonimmigrant requests to change or extend their status, USCIS immigrant fees, and immigrant petitions for foreign nationals who make investments in U.S. commercial enterprises.

Beginning in 2013, the program was operating beyond its approved baseline, a situation DHS referred to as being "in breach."[13] As a result, we reported in 2015 that the program was not in compliance with DHS acquisition policies and procedures. To address the breach, DHS acquisition policies and procedures required that, within 90 days, a new baseline be approved or a program review be conducted to review the proposed baseline revisions. We reported that neither of these actions had taken place since 2013.

However, despite exceeding its approved baseline and operating without a DHS-approved revised acquisition strategy and baseline, the Transformation program continued with its system development efforts. As part of the continued development, USCIS pursued a new acquisition approach. As we reported in May 2015,[14] changes in its approach included changes to the software development methodology, contracting approach, and program architecture and were intended to help address concerns about delays and cost overruns. See table 2 for a description of these changes.

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[12]The initial USCIS ELIS was later replaced with a new system, also called USCIS ELIS, and the first system was decommissioned. More details on this are included after table 2.

[13]DHS programs establish baselines for cost, schedule, and performance expectations. When these expectations are exceeded, such as a cost overrun or schedule delay, the program is considered in breach and required to re-baseline.

[14]GAO-15-415.

Table 2: Key Changes to the Transformation Program's Acquisition Approach

Key change	Previous approach	New approach
Contracting approach	One contractor that served as the sole solution architect and system integrator.	Multiple contractors to provide various services, with USCIS serving as the system integrator.
Software development approach	Waterfall development, an approach that uses long, sequential phases, resulting in product delivery years after program initiation.	Agile software development, an approach that delivers software in small, short increments, resulting in software released in phases.
Program architecture	Included a large number of proprietary commercial off-the-shelf software products, which are ready-made and available for sale.	Includes open source software, which is publicly available for use, study, reuse, modification, enhancement, and redistribution by the software's users. This software is to be used in combination with fewer commercial off-the-shelf products in a cloud computing environment.

Source: GAO analysis of USCIS documentation. | GAO-17-486T

The shift in acquisition approach also resulted in the proposed development of a new USCIS ELIS system. The new system was to be a separate and distinct system from the previously-developed USCIS ELIS. In November 2014, after a year and a half of planning and development, USCIS deployed an initial version of the new USCIS ELIS system to allow for limited processing of permanent resident card renewals and replacements. This initial deployment also tested all core processing capabilities, such as the ability to electronically file or schedule appointments for collecting biometric information.

Between November 2014 and February 2015, the functionality of the new USCIS ELIS was enhanced to allow full processing of permanent resident card renewals and replacements. Nevertheless, during this time, the Transformation Program continued to operate in breach status, without a DHS-approved revised acquisition strategy and baseline. In 2015, we reported[15] that this breach had impacted DHS' ability to effectively oversee and govern the program because oversight was no longer being conducted relative to a current and approved program schedule.

The program's revised acquisition baseline and strategy were formally approved in April 2015, over 2 years after the breach. Under its new acquisition baseline, USCIS estimated the program to cost up to $3.1

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[15]GAO-15-415.

billion and to be fully deployed no later than March 2019. This was an increase of approximately $1 billion and a delay of over 4 years from the program's initial approved baseline in July 2011.

The new acquisition strategy represented official DHS approval of the program's updated acquisition approach and also formally required that the old USCIS ELIS be decommissioned and that USCIS continue to pursue the new USCIS ELIS. In May 2015, we reported that changes in the Transformation Program acquisition strategy intended, in part, to address the breach had contributed to significant delays in the program's planned schedule.[16]

In July 2016, we once again expressed concerns over program performance, focusing on the reliability of the program's cost, schedule, and scope measurements.[17] For example, we reported that delays in the schedule could increase the risk that the program would proceed with future USCIS ELIS development or deployment before it was ready in order to meet committed dates. In addition, we reported that the program was at risk of future schedule delays in later USCIS ELIS releases, which might result in the program exceeding its revised cost or schedule thresholds. We made twelve recommendations to improve the ability of USCIS to manage the program. USCIS concurred with our recommendations and has initiated work to implement them.

USCIS continues to expand the ability of the new USCIS ELIS to process citizenship and immigration benefits. Specifically, after April 2016, USCIS deployed the additional capability to process applications for temporary protected status and additional naturalization forms. However, in August 2016, the program reverted back to the legacy system, called the Computer-Linked Application Information Management System 4, for processing the same naturalization form that had been deployed in the new USCIS ELIS only 4 months earlier. As a result of the switchover and other technical issues with the new system, the program did not complete deployment of system functionality associated with its Citizenship line of

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[16]GAO-15-415.

[17]GAO-16-467.

business by its September 2016 deadline, resulting in another schedule breach.[18]

In November 2016, USCIS submitted a breach remediation plan to the Deputy Under Secretary for Management that identified several root causes for the breach. These causes included that:

- the program's schedule did not allow time to gather user feedback or address complexities discovered during development;

- new requirements were added; and,

- USCIS leadership did not provide any consistent performance requirements on what the program was supposed to accomplish for specific business lines.

USCIS had planned to re-baseline the program in February 2017 to account for the September 2016 breach. However, in December 2016, DHS leadership directed USCIS to stop planning and development for new lines of business, update its breach remediation plan and acquisition documentation, and brief leadership on the program's revised approach by February 2017. The program submitted a revised remediation plan on February 1, 2017. The revised plan was subsequently accepted by the Acting Under Secretary for Management on February 14, 2017.

The revised remediation plan set an expectation that the program would submit revised acquisition documentation for review including a new baseline by February 28, 2017. However, according to the Deputy Chief of the Resource Management Division within the USCIS Office of Information Technology, the program was granted an extension. According to this official, the program expects to discuss the revised acquisition documentation before the Acquisition Review Board in March 2017.

Delays are Impacting the Ability of USCIS to Realize the Benefits of Transformation

The Transformation Program's delays in delivering system functionality have limited USCIS's ability to realize its planned cost savings and operational improvements. With respect to cost savings, the program's business case highlighted cost savings that would be realized from decommissioning legacy systems on full deployment of USCIS ELIS.

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[18]The four lines of business associated with the Transformation program each represent a different set of system functionality. They are (1) non-immigrant, (2) immigrant, (3) humanitarian, and (4) citizenship.

However, these legacy systems must remain operational to allow USCIS to perform its mission until an alternative option is available—thus, preventing the associated savings from being realized. For example, in fiscal year 2014, the total cost of maintaining systems that could have been decommissioned if USCIS ELIS had been fully operational was approximately $71 million. Further, the business case for the Transformation Program identified anticipated cost savings from reducing data entry and mail handling costs. With the continuing delays, however, USCIS will continue to incur such costs while the program awaits full implementation.

In addition, the schedule delays have deferred USCIS's ability to realize operational improvements tied to the program and intended to resolve issues we've previously reported.[19] For example, the Transformation Program is expected to implement organizational and business process changes to better use the new electronic system. According to USCIS, this increased use of IT should help achieve goals such as reducing the immigration benefit backlogs through business process change, improving customer service through expanded electronic filing, and enhancing national security by authenticating users and integrating with external agency databases. However, once again, the delays in delivery of the program mean that these improvements have yet to be achieved.

Program Management Challenges Contribute to System Performance Risks

Prior to the Transformation Program's change in acquisition strategy, USCIS spent more than 8 years and approximately $475 million on developing the old USCIS ELIS. According to program officials, this system was decommissioned in April 2016 due to its instability. As we have reported,[20] the old USCIS ELIS proceeded through development despite challenges in program management and limited oversight. Given this history and the subsequent commitment of additional resources for a new USCIS ELIS, it is more important than ever that USCIS consistently follow key practices associated with software development, systems

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[19]See appendix I for related GAO products.

[20]See, for example, GAO-15-415 and GAO-16-467.

integration and testing, and contract management[21] and execute effective program oversight and governance.

Inconsistent Software Development Practices Risk Further Program Costs and Delays

In July 2016, we reported that the program had at least partially adhered to 7 of 8 key practices[22] for effectively managing Agile software development in producing USCIS ELIS.[23] We reported that the program deviated from key software development practices for various reasons. For example, we reported that the program was not always completing planning for software releases prior to initiating development as required in agency policy. The USCIS Chief Information Officer explained that, although policy requires a program to obtain approval for the scope of each release prior to proceeding with development, this was no longer the practice for the Transformation Program. Instead, approval was granted for six months of development and the scope of that approval was

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[21]These key practices summarize practices that apply to the USCIS Transformation program and are based on leading practices and agency policy and guidance. These practices and their sources are described in more detail in GAO-16-467.

[22]These practices are described in table 3. They are gathered from leading practices and agency policy and guidance. Leading practices were derived from various sources, including GAO, *Software Development: Effective Practices and Federal Challenges in Applying Agile Methods*, GAO-12-681 (Washington, D.C.: Jul. 27, 2012); Office of Management and Budget, U.S. Digital Services, *Playbook* (version pulled Dec. 18, 2015); *TechFAR: Handbook for Procuring Digital Services Using Agile Processes* (draft version pulled Nov. 6, 2014); Software Engineering Institute, *Agile Metrics: Progress Monitoring of Agile Contractors*, CMU/SEI-2013-TN-029 (Jan. 2014); *CMMI® for Development, Version 1.3*, CMU/SEI-2010-TR-033 (Nov. 2010); MITRE, *Defense Agile Acquisition Guide: Tailoring DoD IT Acquisition Program Structures and Processes to Rapidly Deliver Capabilities* (March 2014); *Handbook for Implementing Agile in Department of Defense Information Technology Acquisition* (Dec. 15, 2010); ISO/IEC/IEEE, *Systems and software engineering —Developing user documentation in an agile environment*, Corrected Version, ISO/IEC/IEEE 26515:2012(E) (Mar. 15, 2012) (a full copy of the documents may be found at standards.ieee.org/store); http://agilemanifesto.org.; Ken Schwaber and Jeff Sutherland, *The Scrum Guide:™ The Definitive Guide to Scrum: The Rules of the Game* (Jul. 2013). Applicable agency policy and guidance included U.S. Citizenship and Immigration Services, *Management Instruction CIS-OIT-001, Office of Information Technology: Agile Development Policy* (Apr. 10, 2013); *USCIS Agile Processes and Practices, Principles and Guidelines, version 4.0* (Dec. 6, 2013); *USCIS Transformation Program: System Engineering Life Cycle Tailoring Plan, version 1.0* (March 2015); *USCIS ELIS Team Process Agreement for the April 7, 2015 to September 30, 2015 Development Period;* and *USCIS ELIS Team Process Agreement for the July 22, 2015 to January 30, 2016 Development Period*.

[23]GAO-16-467.

revisited as needed. In contrast, time frames of individual releases were expected to vary depending on the scope of the release.

We also found that the program was not consistently following other key practices and that controls were not always in place to ensure the program adhered to them. For example, with respect to monitoring and reporting on program performance through the collection of reliable metrics, we were unable to track monthly reports on program scope back to the associated software release backlog. In addressing this matter, the Business Integration Division within the Office of Transformation Coordination acknowledged issues regarding traceability. The division subsequently determined that its process for tracking monthly reports on program scope back to the associated software release backlog was not effective since it relied solely on the review of the user stories. The division acknowledged that requirements traceability is critical to avoid scope creep and to demonstrate that the features implemented addressed the mission needs.

With respect to the practice of setting outcomes for Agile software development, which is the only key practice that the program did not fully or partially address, the program did not define Agile software development outcomes. The program provided various reasons for not addressing the practice. For example, the Chief of OTC stated that the outcome or goal for the program is to deploy a product line within baseline cost, schedule, and performance parameters. Nevertheless, we reported that the program had not established a well understood goal, or set of goals, for its transition to Agile development. Table 3 describes the program's satisfaction of key practices in developing USCIS ELIS.

Table 3: Satisfaction of Key Agile Development Management Practices

Key practice	Rating
Completing planning for software releases prior to initiating development and ensuring software meets business expectations prior to deployment	◐
Adhering to the principles of the framework adopted for implementing Agile software development	◐
Defining and consistently executing appropriate roles and responsibilities for individuals responsible for development activities	◐
Identifying users of the system and involving them in release planning activities	◐
Writing user stories that identify user roles, include estimates of complexity, take no longer than one sprint to complete, and describe business value	◐
Prioritizing user stories to maximize the value of each development cycle	●
Setting outcomes for Agile software development	○
Monitoring and reporting on program performance through the collection of reliable metrics	◐

Source: GAO analysis of USCIS documentation. I GAO-17-486T

Note: ● yes ◐ partial ○ no

An element was determined to be a "no" if USCIS provided no evidence to satisfy any portion of the practice; "partial" if USCIS provided evidence that satisfied some, but not all, of the practice; and "yes" if USCIS provided evidence that it substantially satisfied all elements of the practice.

In not addressing key practices for Agile software development, the program faces added risks in deploying a system that does not meet the cost, schedule, or the performance needs of USCIS. We recommended that the program, with assistance from the department, take seven actions to provide reasonable assurance that it executes Agile software development for USCIS ELIS consistent with its own policies and guidance and follows applicable leading practices. At present, all of these recommendations remain open.

Testing Practices Need Improvement to Address System Performance Risks

In this same report,[24] we found that the program was not consistently following key system integration and testing practices.[25] Specifically, the

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[24]GAO-16-467.

program had fully implemented 1 and partially implemented 2 key practices. For example, the program had established an environment and procedures for continuous integration and was conducting unit and integration, functional acceptance, interoperability, and end user tests, as well as performing code inspection. However, we also found that the program was not consistently adhering to its policies and guidance[26] or meeting benchmarks for unit and integration, and functional acceptance tests, and code inspection. Moreover, test plans, cases, and results were not fully developed for interoperability and end user testing.

We reported that the implementation of systems integration and testing deviated from key practices in part because policy and guidance were not being updated to reflect changes in the approach. For example, with respect to performing continuous testing, the program did not meet its stated goals for continuous testing because, according to the USCIS Chief Information Officer, certain program goals were unrealistic. Table 4 describes the program's satisfaction of key practices in USCIS ELIS integration and testing.

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[25]These practices are described in table 4. They are gathered from multiple sources, including leading practices and agency policy and guidance. Leading practices were derived from various sources, including ISO/IEC/IEEE, *ISO/IECIEEE Standard 29119, Software and System Engineering – Software Testing, Part 1: Concepts and Definitions, Part 2: Test Process, Part 3: Test Documentation* (New York, NY, September 2013) (a full copy of the documents may be found at standards.ieee.org/store). Applicable agency policy and guidance included Department of Homeland Security, *Pre-Decisional Draft, DHS Agile Development Guidebook* (Sept. 2, 2014); U.S. Citizenship and Immigration Services, *USCIS Test and Evaluation Master Plan: Electronic Immigration System, version 1.0* (February 2015); *USCIS ELIS Team Process Agreement for the April 7, 2015 to September 30, 2015 Development Period;* and *USCIS ELIS Team Process Agreement for the July 22, 2015 to January 30, 2016 Development Period*; *Agile Processes and Practices Principles and Guidelines, version 4.0* (Dec. 6, 2013); *USCIS Test Plan for Release 5.1-6.0* (10/15/2014-4/15/2015); *USCIS Test Plan* (updated July 2015).

[26]Department of Homeland Security, *Pre-Decisional Draft, DHS Agile Development Guidebook* (Sept. 2, 2014); U.S. Citizenship and Immigration Services, *USCIS Test and Evaluation Master Plan: Electronic Immigration System, version 1.0* (February 2015); *USCIS ELIS Team Process Agreement for the April 7, 2015 to September 30, 2015 Development Period;* and *USCIS ELIS Team Process Agreement for the July 22, 2015 to January 30, 2016 Development Period*; *USCIS Agile Processes and Practices Principles and Guidelines, version 4.0* (Dec. 6, 2013); *USCIS Test Plan for Release 5.1-6.0* (10/15/2014-4/15/2015); *USCIS Test Plan* (updated July 2015).

Table 4: Satisfaction of Key Integration and Testing Practices

Key practice	Rating
Establishing an environment and procedures for continuous integration and testing of code	●
Performing continuous testing through the use of unit and integration tests, functional acceptance tests, and code inspection	◑
Developing complete test plans and cases for interoperability and end user testing and documenting those results	◑

Source: GAO analysis of USCIS documentation. I GAO-17-486T

Note: ● yes ◑ partial ○ no

An element was determined to be a "no" if USCIS provided no evidence to satisfy any portion of the practice; "partial" if USCIS provided evidence that satisfied some, but not all, of the practice; and "yes" if USCIS provided evidence that it substantially satisfied all elements of the practice.

In addition, program policy and guidance did not always align with key practices in systems integration and testing, nor were controls always in place to ensure adherence to policy and guidance. For example, before a developer could integrate code with that of other developers or development teams, peer inspection by another individual was expected to occur to help ensure that the code met program standards. However, the program had not established controls to monitor the extent to which peer inspection had occurred.

As a result of these findings on systems integration and testing, we reported that the program risked poor system performance after being released to the public. At that time, this risk was already being realized. Specifically, the program had reported experiencing issues with USCIS ELIS as a result of deploying software that had not been fully tested. For example:

- In June 2015, the Quality Assurance Team reported that production issues, such as bugs and defects, had increased noticeably after the February 2015 deployment.

- In July 2015, the Quality Assurance Team reported that defects (originating from either production or development) were becoming a significant part of USCIS ELIS iteration work.

- On September 22, 2015, in addition to prior and subsequent outages of the system, the Quality Assurance Team reported that USCIS ELIS was unavailable for approximately 15 hours due to issues with code quality.

- On September 24, 2015, USCIS ELIS encountered performance problems that impacted nearly 5,000 cases. Approximately 2,600 of these cases had to be abandoned.

- In November and December 2015, the Quality Assurance Team reported that code quality had become a major issue.

- In January 2016, the program reported more than 800 minutes in unplanned network outages.

- In February 2016, the program reported missing the threshold for USCIS ELIS reliability (e.g. mean time between failure), for two straight months and four of the last six months.

- In March 2016, program metrics indicated that production tickets were increasing faster than they could be addressed.

Based on these findings associated with systems integration and testing, we made two recommendations to the program. These recommendations were associated with updating existing policy and guidance for systems integration and testing and considering additional controls. At present, these recommendations remain open.

Contract Oversight Practices Limit Contractor Accountability

In the same report,[27] based on a review of six contracts,[28] we found that USCIS had mixed success in implementing selected key contract management internal controls.[29] Specifically, we found that contracting officer representatives were meeting training requirements and USCIS had documented its rationale for not pursuing selected contracts as performance based. However, we also reported that the program could improve contract monitoring to provide reasonable assurance that contractors were meeting program needs. For example, we reported that

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[27]GAO-16-467.

[28]These six contracts were two firm, fixed-price contracts managed by the program office and four cost-plus-fixed-fee contracts managed by the Office of Information Technology.

[29]The key internal controls are described in GAO, *Standards for Internal Control in the Federal Government*, GAO/AIMD-00-21.3.1, (Washington, D.C.: November 1999); *National Flood Insurance Program: Progress Made on Contract Management but Monitoring and Reporting Could be Improved*, GAO-14-160 (Washington, D.C.: Jan. 15, 2014): Office of Federal Procurement Policy, A Guide to Best Practices for Contract Administration, (Washington, D.C.: October 1994); Department of Homeland Security, *Federal Acquisition Certification for Contracting Officer's Representatives and Appointment and Revocation, Acquisition Workforce Policy Number 064-04-003, Revision 02* (Aug. 8, 2012); *Contracting Officer's Representative (COR) Essential Element Guidebook, Spiral 1* (September 2012); and *Office of Procurement Operations: Acquisition Manual, version 1.0* (May 1, 2015).

- The Agile development services contract contained appropriate performance criteria that linked to the program goals, but the program did not clearly define measures against which to analyze differences between services expected and those delivered. Because oversight of contractor performance resides with the Office of Transformation Coordination and management of the contract is the responsibility of the Office of Information Technology, we reported that the need for clearly-defined performance measures was particularly important.

- The program maintained some required documentation in contract files and used contractor performance assessments. However, more clearly defined success measures and evaluation against those measures could have alerted the program to issues in systems integration and testing.

Based on these findings, we reported that the agency lacked information for measuring contractor performance and determining if the Office of Information Technology was meeting its objectives in supporting the program. To help improve oversight of these selected contracts, we made three recommendations focused on contract administration and supporting controls. Since then, the agency has taken steps to close these recommendations, successfully closing two of the three. If effectively implemented, these actions should contribute to improved administration of the contracts that we assessed in our review.

DHS Oversight Bodies Need to Improve Governance and Oversight of the Transformation Program

We also reported in May 2015[30] that the program's two key governance bodies were mostly taking actions aligned with leading practices, but that their decisions were made based on unreliable information. For example, we reported that the Acquisition Review Board ensured that corrective actions were identified when cost, schedule, or performance issues arose. However, the board was not always monitoring performance and progress toward a predefined cost and schedule or ensuring that corrective actions were tracked until the desired outcomes were achieved.

In addition, we found that two DHS offices assisting in overseeing the program—the Office of Program Accountability and Risk Management and the Office of the Chief Information Officer— developed program

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[30]GAO-15-415.

assessments that reflected unreliable and, in some cases, inaccurate information. For example, the Office of the Chief Information Officer performed four assessments of the Transformation Program from June 2013 through June 2014. The most recent assessment available at the time, from June 2014, stated that the program underwent a re-baseline for release 5.0 and, as a result, reported an acceptable schedule variance and positive cost performance. However, at that time, the program had experienced over a 4-year delay in its schedule and had not performed a re-baseline to bring it back within cost and schedule thresholds.

Based on these findings, we reported that the ability of governance bodies to make timely decisions and provide effective oversight was limited. To help improve program governance, we made four recommendations. Subsequently, the program addressed one recommendation by establishing a new baseline, although that baseline has again been breached. The program has taken steps to close the remaining recommendations, although the recommendations remain open.

In summary, the USCIS Transformation Program began officially pursuing a new acquisition strategy in April 2015 to mitigate risks encountered in developing the original system. However, this new strategy reflects a higher cost estimate and a longer amount of time before the system is fully implemented than the program's previously approved strategy. In addition, the program is again encountering issues in development and production. If the agency does not address issues in its efforts to develop and test software, oversee contractors, and govern the program it risks additional cost increases, schedule delays, and performance shortfalls. In addition, continued delays limit the program's ability to achieve critical goals, such as delivering system functionality to enhance customer service and enhancing national security.

Chairman Perry, Ranking Member Correa, and Members of the subcommittee, this completes my prepared statement. I would be pleased to respond to any questions that you may have at this time.

Contacts and Acknowledgments

If you or your staffs have any questions about this testimony, please contact Carol C. Harris, Director, Information Technology Acquisition Management Issues, at (202) 512-4456 or harriscc@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this testimony statement. GAO staff who made key contributions to this testimony are Michael Holland (Assistant Director), Mathew Bader (Analyst in Charge), and Nancy Glover.

Appendix I: Related GAO Products

Immigrant Investor Program: Progress Made to Detect and Prevent Fraud, but Additional Actions Could Further Agency Efforts, GAO-16-828 (Washington, D.C.: Sept. 13, 2016).

Immigration Benefits System: U.S. Citizenship and Immigration Services Can Improve Program Management, GAO-16-467 (Washington, D.C.: July 7, 2016).

Asylum: Additional Actions Needed to Assess and Address Fraud Risks, GAO-16-50 (Washington, D.C.: Dec. 2, 2015).

Immigrant Investor Program: Additional Actions Needed to Better Assess Fraud Risks and Report Economic Benefits, GAO-15-696 (Washington, D.C.: Aug. 12, 2015).

Immigration Benefits System: Better Informed Decision Making Needed on Transformation Program, GAO-15-415 (Washington, D.C.: May 18, 2015).

H-2A and H-2B Visa Programs: Increased Protections Needed for Foreign Workers, GAO-15-154 (Washington, D.C.: Mar. 6, 2015).

Immigration Benefits: Improvements Needed to Fully Implement the International Marriage Broker Regulation Act, GAO-15-3 (Washington, D.C.: Dec. 10, 2014).

H-2A Visa Program: Modernization and Improved Guidance Could Reduce Employer Application Burden, GAO-12-706 (Washington, D.C.: Sept. 12, 2012).

Immigration Benefits: Consistent Adherence to DHS's Acquisition Policy Could Help Improve Transformation Program Outcomes, GAO-12-66 (Washington, D.C.: Nov. 22, 2011).

Department of Homeland Security: Progress Made and Work Remaining in Implementing Homeland Security Missions 10 Years after 9/11, GAO-11-881 (Washington, D.C.: Sept. 7, 2011).

Immigration Benefits: Actions Needed to Address Vulnerabilities in Process for Granting Permanent Residency, GAO-09-55 (Washington, D.C.: Dec. 5, 2008).

USCIS Transformation: Improvements to Performance, Human Capital, and Information Technology Management Needed as Modernization Proceeds, GAO-07-1013R (Washington, D.C.: July 17, 2007).

Appendix II: Status of GAO Recommendations to Improve Transformation Program Performance

Recommendation	Report	Status
1. Document specific performance measures and targets for the pilots, increments, and the transformed organization that are outcome-oriented, objective, reliable, balanced, limited to the vital-few, measurable, and aligned with organizational goals.	GAO-07-1013R	Closed
2. Increase coordination between program office and the Office of Human Capital to ensure transformation and human capital change initiatives are aligned.	GAO-07-1013R	Closed
3. Plan for the number and types of human resources required in the program office to carry the transformation through 2012.	GAO-07-1013R	Closed
4. Plan for obtaining and developing the IT human capital necessary to support the transformation.	GAO-07-1013R	Closed
5. Determine the critical skills and competencies that will be needed to achieve future programmatic results as well as strategies to address gaps in employee numbers, deployment, and skills and competencies.	GAO-07-1013R	Closed
6. Address continuity in key transformation leadership positions and address impacts to time frames when key personnel leave.	GAO-07-1013R	Closed
7. Use performance expectations and competencies to hold USCIS executives and employees accountable for achieving the goals of the transformation.	GAO-07-1013R	Closed
8. Continue to develop an enterprise architecture that sufficiently guides and constrains the transformation plans, as DHS works to address limitations in its own enterprise architecture and alignment processes.	GAO-07-1013R	Closed
9. Complete a comprehensive communication strategy that involves communicating early and often to build trust, ensuring consistency of message, and encouraging two-way communication. Further, the communication strategy should address plans for communicating implementation goals and timelines to demonstrate progress.	GAO-07-1013R	Closed
10. Complete a comprehensive communication strategy that addresses plans for formally engaging internal and external stakeholders throughout the transformation, and tailors information to meet these stakeholders' specific needs.	GAO-07-1013R	Closed
11. Complete a comprehensive communication strategy that addresses plans for a long-term, detailed strategy to share information with employees and stakeholders over the course of the transformation.	GAO-07-1013R	Closed
12. Document specific performance measures and targets for the pilots, increments, and the transformed organization that are outcome-oriented, objective, reliable, balanced, limited to the vital-few, measurable, and aligned with organizational goals.	GAO-07-1013R	Closed
13. Develop and maintain an Integrated Master Schedule consistent with these same best practices for the Transformation Program.	GAO-12-66	Closed
14. Ensure that the life-cycle cost estimate is informed by milestones and associated tasks from reliable schedules that are developed in accordance with the nine best practices we identified.	GAO-12-66	Closed
15. Re-baseline cost, schedule, and performance expectations for the remainder of the Transformation Program.	GAO-15-415	Closed
16. Ensure that the Acquisition Review Board is effectively monitoring the Transformation Program's performance and progress toward a predefined cost and schedule; ensuring that corrective actions are tracked until the desired outcomes are achieved; and relying on complete and accurate program data to review the performance of the Transformation Program against stated expectations.	GAO-15-415	Open

Recommendation	Report	Status
17. Ensure that the Executive Steering Committee is effectively monitoring the Transformation Program's performance and progress toward a predefined cost and schedule and relying on complete and accurate program data to review the performance of the Transformation Program against stated expectations.	GAO-15-415	Open
18. Direct the department's Chief Information Officer to use accurate and reliable information, such as operational assessments of the new architecture and cost and schedule parameters approved by the Under Secretary of Management.	GAO-15-415	Open
19. Complete planning for software releases prior to initiating development and ensure software meets business expectations prior to deployment.	GAO-16-467	Open
20. Consistently implement the principles of the framework adopted for Agile software development.	GAO-16-467	Open
21. Define and consistently execute appropriate roles and responsibilities for individuals responsible for development activities consistent with its selected development framework.	GAO-16-467	Open
22. Identify all system users and involve them in release planning activities.	GAO-16-467	Open
23. Write user stories that identify user roles, include estimates of complexity, take no longer than one sprint to complete, and describe business value.	GAO-16-467	Open
24. Establish outcomes for Agile software development.	GAO-16-467	Open
25. Monitor program performance and report to appropriate entities through the collection of reliable metrics.	GAO-16-467	Open
26. Conduct unit and integration, and functional acceptance tests, and code inspection consistent with stated program goals.	GAO-16-467	Open
27. Develop complete test plans and cases for interoperability and end user testing, as defined in the USCIS Transformation Program Test and Evaluation Master Plan, and document the results.	GAO-16-467	Open
28. Clearly define measures against which to analyze differences between services expected and those delivered.	GAO-16-467	Closed
29. Ensure contracting officer representatives are maintaining complete contract files.	GAO-16-467	Open
30. Ensure quality assurance surveillance plans are developed when appropriate.	GAO-16-467	Closed

Source: GAO analysis of DHS and USCIS documentation | GAO-17-486T