U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF INSPECTOR GENERAL

Catalyst for Improving the Environment

Audit Report

Improvements Needed in EPA's Efforts to Replace Its Core Financial System

Report No. 11-P-0019

November 29, 2010

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Abbreviations

EPA	U.S. Environmental Protection Agency
FFMSR	Federal Financial Management Systems Requirements
FMLoB	Financial Management Line of Business
FSIO	Financial Systems Integration Office
IFMS	Integrated Financial Management System
IV&V	Independent Verification and Validation
JFMIP	Joint Financial Management Improvement Program
OCFO	Office of the Chief Financial Officer
OIG	Office of Inspector General
OMB	Office of Management and Budget
PAT	Product Acceptance Testing
PMA	President's Management Agenda
SLCM	Systems Life Cycle Management

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U.S. Environmental Protection Agency
Office of Inspector General

At a Glance

Catalyst for Improving the Environment

Why We Did This Review

We sought to evaluate whether the Office of the Chief Financial Officer (OCFO) effectively managed the system development project to replace the U.S. Environmental Protection Agency's (EPA's) core financial system, the Integrated Financial Management System (IFMS). We also sought to evaluate whether the system development project is achieving the desired results.

Background

In 1989, EPA implemented IFMS as its core financial management and budget execution system. In 2001, EPA began the process to replace IFMS. EPA selected a commercial-off-the-shelf core financial system certified by the General Services Administration Financial Systems Integration Office.

For further information, contact our Office of Congressional, Public Affairs and Management at (202) 566-2391.

To view the full report, click on the following link:
www.epa.gov/oig/reports/2011/20101129-11-P-0019.pdf

Improvements Needed in EPA's Efforts to Replace Its Core Financial System

What We Found

OCFO's management control processes do not ensure compliance with EPA's Systems Lifecycle Management policies and procedures. Such compliance is necessary to provide reasonable assurance that efforts to replace the Agency's core financial system achieve the desired results. EPA's system development policies and procedures identify specific activities and documents required during a system development project. However, OCFO's internal control environment does not enforce these policies and procedures. OCFO proceeded with the design subphase of the system project without obtaining executive management approval of the updated system requirements or developing and obtaining the required approval of test plans to ensure the system will meet Agency needs. Furthermore, OCFO did not predetermine the acceptable product acceptance test script failure percentages to be used as the basis for management's go/no-go decision to proceed with using the evaluated product. These conditions could result in a system that does not meet management's expectations and EPA's needs, and/or does not comply with all applicable federal and EPA requirements.

What We Recommend

We recommend that the Chief Financial Officer develop and implement formal procedures for future projects to ensure that the requirements document(s) and test plans are authorized by executive management prior to approving the system to move into the next phase of the lifecycle. We recommend that any subsequent changes to the requirements document(s) and/or test plans be authorized by executive management prior to making changes to the design of the system.

We also recommend that the Chief Financial Officer develop and implement formal procedures to ensure that the test plan associated with product acceptance testing, or any other test on which management relies, includes criteria that define what constitutes pass or failure to ensure that management has a basis for making go/no-go decisions.

The Agency agreed with the recommendations with agreed-upon corrective actions pending.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

THE INSPECTOR GENERAL

November 29, 2010

MEMORANDUM

SUBJECT: Improvements Needed in EPA's Efforts to Replace Its Core Financial System
Report No. 11-P-0019

FROM: Arthur A. Elkins, Jr.
Inspector General

TO: Barbara Bennett
Chief Financial Officer

This is our report on the subject audit conducted by the Office of Inspector General (OIG) of the U.S. Environmental Protection Agency (EPA). This report contains findings that describe the problems the OIG has identified and corrective actions the OIG recommends. This report represents the opinion of the OIG and does not necessarily represent the final EPA position. Final determinations on matters in this report will be made by EPA managers in accordance with established audit resolution procedures.

The estimated cost of this report, calculated by multiplying the project's staff days and expenses by the applicable daily full cost billing rates in effect at the time, is $136,849.

Action Required

In accordance with EPA Manual 2750, you are required to provide a written response to this report within 90 calendar days. You should include a corrective actions plan for agreed-upon actions, including milestone dates. Your response will be posted on the OIG's public website, along with our memorandum commenting on your response. Your response should be provided as an Adobe PDF file that complies with the accessibility requirements of section 508 of the Rehabilitation Act of 1973, as amended. The final response should not contain data that you do not want to be released to the public; if your response contains such data, you should identify the data for redaction or removal. We have no objections to the further release of this report to the public. We will post this report to our website at http://www.epa.gov/oig.

If you or your staff have any questions regarding this report, please contact Patricia H. Hill at 202-566-0894 or hill.patricia@epa.gov, or Rudolph M. Brevard at 202-566-0893 or brevard.rudy@epa.gov.

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Purpose

We sought to evaluate whether the Office of the Chief Financial Officer (OCFO) effectively managed the information technology project to replace the U.S. Environmental Protection Agency's (EPA's) core financial system, the Integrated Financial Management System (IFMS). We also sought to evaluate whether the system development project is achieving the desired results.

Background

Based on requirements and demands placed on EPA by internal and external stakeholders, EPA decided to explore new core financial system options. The Financial Replacement Systems investment is OCFO's ongoing modular approach to replacing its legacy financial systems, which include IFMS. EPA implemented IFMS in 1989 as its management and budget execution system.

In February 2001, EPA hired a contractor to conduct an analysis of the Agency's current financial systems and document the results in a strategic assessment. This assessment initiated the exploration for a new application. In January 2006, EPA issued a request for proposal to obtain bids for the project. EPA selected a commercial-off-the-shelf core financial system that is certified by the General Services Administration Financial Systems Integration Office (FSIO).

EPA issued its Systems Life Cycle Management (SLCM) policy to promote effective and efficient processes for designing and operating information systems. Consistent with the policy, EPA's SLCM procedure requires periodic, documented, management-level review of projects by the sponsoring office. The procedure requires program managers to oversee activities and establishes key opportunities to review development as the project progresses. These EPA policy documents define major decision points as "control gates." The SLCM procedure requires the system manager to provide the required SLCM documentation to senior management for approval at each control gate. The procedure then requires senior management to make a go/no-go decision based on a review to ensure the required work products for each control gate are completed, approved, and verified. The policy and procedure also dictate that a system cannot move to the next phase without a go decision for the specific control gate.

Many internal and external issues occurred during the lifecycle of this project, resulting in baseline changes and schedule delays. Appendix A highlights some of the issues that appear to have significantly altered the course of this project. The OCFO Office of Technology Solutions is managing the implementation of EPA's SLCM processes for this project. See appendix B for specific details of EPA's SLCM phases, subphases, and control gates.

Scope and Methodology

We conducted this audit from January through September 2010, at EPA headquarters in Washington, DC. We conducted the audit in accordance with generally accepted government auditing standards. These standards require that we plan and perform the audit to obtain sufficient and appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions.

We performed a limited review of the status of the SLCM processes the Agency had undergone up to this point to replace IFMS. According to the project manager, at the start of the audit, the Agency had just moved into the design subphase of the acquisition/development phase of the SLCM process. We considered relevant internal controls associated with the objectives of our review. We reviewed system lifecycle documentation and interviewed Agency personnel involved with the replacement system project. We did not look in detail at any specific subphase of the SLCM process, but rather evaluated the applicable documentation to assess compliance with EPA's SLCM procedures. For example, we did not test the adequacy of system requirements but rather verified whether EPA defined and authorized them.

Findings

OCFO's management control processes do not ensure compliance with EPA's SLCM policies and procedures necessary to provide reasonable assurance that efforts to replace the Agency's core financial system achieve the desired results. OCFO proceeded with the design subphase without obtaining executive management's approval of the revised requirements or developing and obtaining required approval of the associated test plans as required by EPA's SLCM procedure. Furthermore, OCFO did not predetermine the acceptable product acceptance test (PAT) script failure percentages to be used as the basis of management's go/no-go decision on the project. These conditions could result in a system that does not meet management's expectations and EPA's needs, and/or does not comply with all applicable federal and EPA requirements.

Key Requirements Phase Documentation Not Authorized Before Moving Into Design Subphase

In October 2008, the acting director for the Office of Enterprise Technology Innovations issued, and the deputy chief financial officer approved, a decision memorandum directing the project team to proceed to the design subphase prior to completing key activities in the requirements subphase. OCFO proceeded to the acquisition/development phase's design subphase of implementation without solidifying requirements or developing and approving test plans. Without

solidified requirements, it is difficult for OCFO to create test plans that ensure that the system meets the needs of the Agency.

According to Agency policies and procedures, the requirements document(s) and test plans must be completed and approved by executive management prior to moving from the requirements subphase into subsequent phases of the system's lifecycle. Also, any subsequent changes to either the requirements or test plans must be authorized by executive management prior to making changes to the design of the system. OCFO did not receive approval to make changes to its requirements from the Change Control Board until May 2010, over a year and a half after OCFO had moved into the design subphase.

The system manager must ensure that specific, complete, measurable, and testable requirements and associated test plans are developed and approved by executive management prior to moving from the requirements subphase to subsequent phases. Additionally, the system manager must ensure that any changes to the requirements and/or test plans in subsequent phases are approved by executive management prior to making changes to the design. If specific, complete, measurable, and testable requirements and test plans are not developed, EPA cannot be sure that all requirements are met.

Product Acceptance Criteria Not Defined Before Testing

OCFO did not establish thresholds for PAT success or failure on which management would make a go/no-go decision prior to executing the test. According to the contract:

> The awardee shall conduct a PAT using the configuration that demonstrates the solution meets the requirements indicated as met "out of the box" in the awardee's response to the Requirements Matrix. The awardee shall complete the PAT within the timeframe and acceptance metrics proposed by the Awardee and accepted by the Government.

Without predefined test criteria, OCFO did not have objective measures to ensure that the intent of the PAT was met and the out-of-the-box system met the requirements as indicated by the contractor.

Additionally, OCFO could not provide a test plan approved by senior management that defined and documented the test (purpose, requirements, test scripts, the criteria associated with the results to be applied for making the go/no-go decision, etc.). Such a test plan should have been developed and approved by executive management prior to the acquisition/development phase (the phase in which the PAT occurred). The lack of predefined test result thresholds for pass/failure on the PAT scripts could result in a product that requires significant customization to meet Agency requirements.

Recommendations

We recommend that the Chief Financial Officer:

1. Develop and implement formal procedures for future projects to ensure that:

    a. the requirements document(s) and test plans are authorized by executive management (as a part of the definition phase's requirements subphase) prior to approving the system to move into the next phase of the lifecycle, and
    b. any subsequent changes to the requirements document(s) and/or test plans are authorized by executive management prior to making changes to the design of the system.

2. Develop and implement formal procedures to ensure that the test plan associated with PAT or any other test includes criteria that define what constitutes pass or failure to ensure that management has a basis for making go/no-go decisions.

Agency Comments and OIG Evaluation

In its October 12, 2010, response to the draft audit report, OCFO agreed with our recommendations. OCFO is planning to take actions to improve its processes related to our findings and recommendations. OCFO indicated that it plans to develop a checklist to identify, track, and monitor the requirements approval process and provide training on the procedures for obtaining executive management's approval for changes to requirements and test plans. OCFO also plans to develop processes, revise existing procedures, and provide training associated with go/no-go decisionmaking criteria and ensure that the criteria are defined and approved prior to the start of work. We consider all of the recommendations open with agreed-upon corrective actions pending. The Agency's complete response is provided in appendix C.

Status of Recommendations and Potential Monetary Benefits

RECOMMENDATIONS						POTENTIAL MONETARY BENEFITS (in $000s)	
Rec. No.	Page No.	Subject	Status[1]	Action Official	Planned Completion Date	Claimed Amount	Agreed-To Amount
1	4	Develop and implement formal procedures for future projects to ensure that: a. the requirements document(s) and test plans are authorized by executive management (as a part of the definition phase's requirements subphase) prior to approving the system to move into the next phase of the lifecycle, and b. any subsequent changes to the requirements document(s) and/or test plans are authorized by executive management prior to making changes to the design of the system.	O	Chief Financial Officer			
2	4	Develop and implement formal procedures to ensure that the test plan associated with PAT or any other test includes criteria that define what constitutes pass or failure to ensure that management has a basis for making go/no-go decisions.	O	Chief Financial Officer			

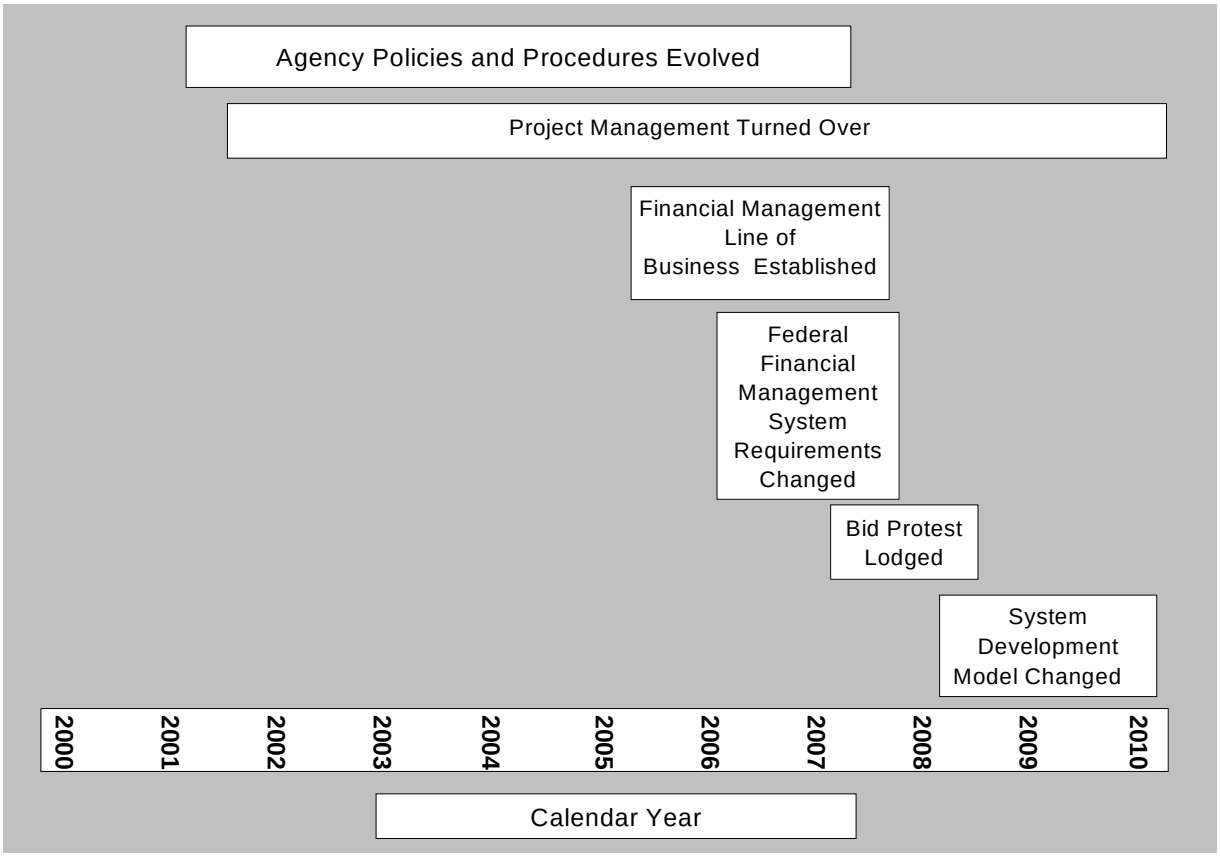
[1] O = recommendation is open with agreed-to corrective actions pending
C = recommendation is closed with all agreed-to actions completed
U = recommendation is undecided with resolution efforts in progress

Appendix A

Summary of Issues That May Have Contributed to Delays

A number of events occurred during the system development project that slowed the project's progress. Each is shown in the timeline below (figure A-1) and explained in the text that follows.

Figure A-1: Financial Replacement System chronological project roadblocks



Source: OIG analysis.

Agency Policies and Procedures Evolved

Throughout the lifecycle of this project, EPA governed its systems development activities under multiple, evolving systems lifecycle management procedures. When the project began in 2001, EPA policy for SLCM was documented in the Information Resources Management Manual Chapter 17, Systems Life Cycle Management, issued August 28, 1994. An Interim Agency SLCM Procedure, which was approved on April 29, 2005, and the SLCM Procedure, which was approved on June 28, 2007, superseded the Information Resources Management Manual.

Differences in these documents may have contributed to delays throughout the lifecycle of this project. In the 2005 and 2007 SLCM procedures, the SLCM is broken into the following phases:

- Definition phase
- Development or acquisition phase (2005 procedure)
  Acquisition/development phase (2007 procedure)
- Implementation phase
- Operations and maintenance phase
- Termination phase

The 2007 SLCM procedure documents the same phases but broke down some of the phases into subphases and established control gates to which the Agency must adhere. The subphases for the definition phase are concept exploration, system planning, and requirements. The acquisition and development subphases are acquisition, design, development, and test.

Project Management Turned Over

Since this project began, persons holding project management responsibility on the Financial System Modernization Project have retired or left to pursue other opportunities. Loss of expertise and knowledge over the lifetime of the project has presented challenges in maintaining artifacts as well as understanding undocumented thought processes.

Financial Management Line of Business Established

A major hurdle that the Agency faced during the procurement was deciding which procurement vehicle to use as well as ensuring that the process was competitive and complied with federal procurement regulations and the federal government's implementation of the Financial Management Line of Business (FMLoB) initiative established by the Office of Management and Budget (OMB).

In 2001, President Bush created the President's Management Agenda (PMA) to address the need for citizen-centered, results-oriented, and market-based federal government initiatives. The success of the PMA depended on federal agencies working as a team across traditional boundaries to better serve the American people by focusing on citizens rather than individual agency needs. Pursuant to the PMA, OMB created the lines-of-business initiatives, which address redundant information technology investments and business processes across the federal government. The lines-of-business initiatives afforded agencies an unprecedented opportunity to influence the direction of specific core business functions government-wide. The FMLoB was created as part of these initiatives. FSIO, within the General Services Administration Office of Technology Strategy, is the program manager for FMLoB.

In June 2005, EPA issued the initial acquisition strategy for the replacement system project, stating that it planned to use a General Services Administration schedule to issue a blanket purchase agreement for services needed for the replacement system project. In fall 2005, OMB began to issue guidance directing agencies to use commercial vendors or the center of excellence

vendors for implementation as well as hosting services In January 2006, EPA revised its acquisition strategy to address OMB's guidance.

Federal Financial Management System Requirements Changed

EPA's original requirements were documented under the Joint Financial Management Improvement Program (JFMIP) Federal Financial Management Systems Requirements (FFMSR), in place in October 2005 when the original solicitation package was put together. The JFMIP principals voted to modify the roles and responsibilities of the JFMIP and established FSIO within the General Services Administration, which was formerly known as the JFMIP staff office. FSIO issued new FFMSRs in 2006, which replaced the associated JFMIP FFMSRs. In August 2009, OCFO underwent a process to recertify the requirements to ensure compliance with the new FSIO FFMSRs, among other inputs.

Bid Protest Lodged

A bid protest over the contract award associated with this project also added to the delays. EPA awarded the contract on February 12, 2007. One of the unsuccessful vendors filed a bid protest on February 26, 2007. The U.S. Government Accountability Office sustained/approved the bid protest on June 4, 2007. The award protest was resolved on April 10, 2008, and the first task order was issued on May 6, 2008.

System Development Model Changed

The decision to begin the implementation with the Rapid Prototype Life Cycle system development model in 2005 and then to change to the spiral model in 2008 may have contributed to some of the Agency's time lags and schedule delays.

In a rapid prototype development effort, an initial set of system requirements is translated into a test environment, and end users provide feedback. The feedback may lead to changes in configuration, business process reengineering, or other modifications. While every attempt will be made to minimize customizations to the commercial software, some customizations may be needed. The process of building, using, evaluating, and refining goes through several iterations before the system is ready for deployment. As the project progresses, the rapid prototype model may be tailored.

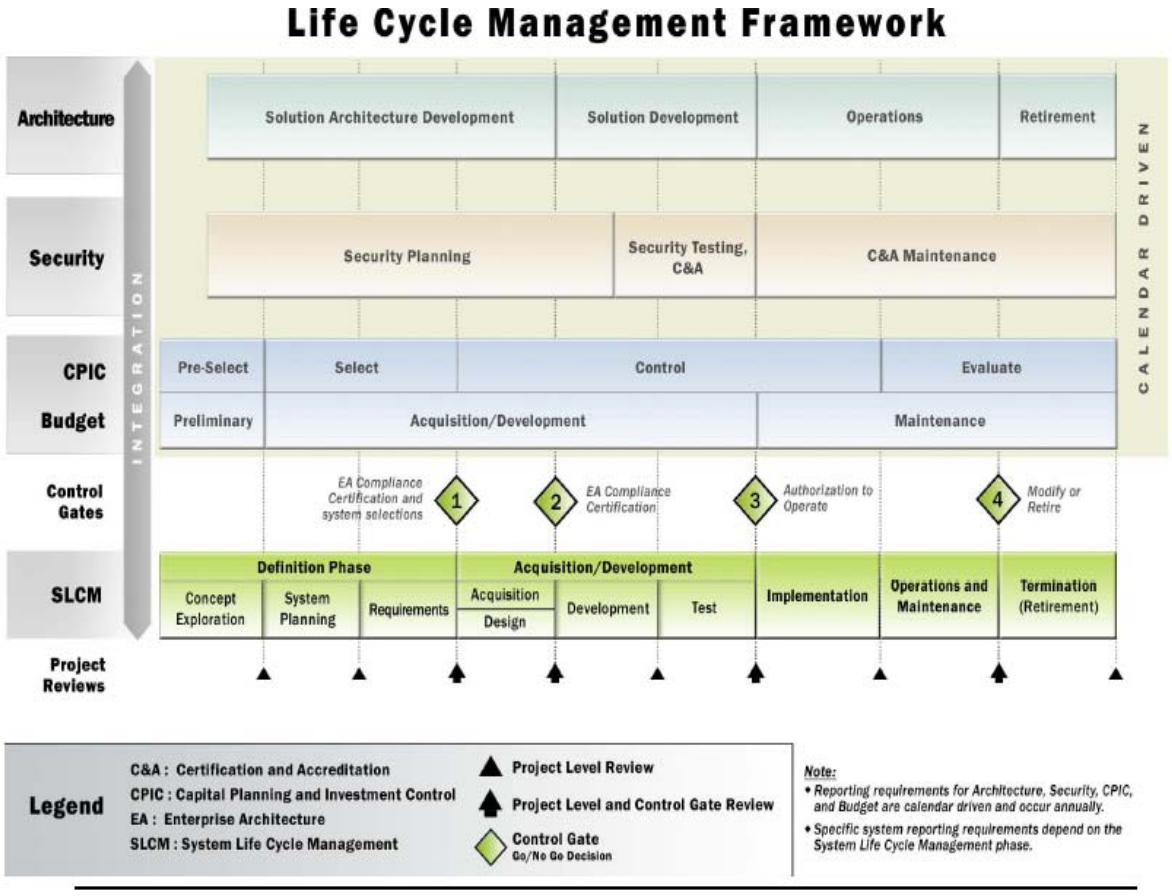
The Spiral Life Cycle Model encompasses the best features of both the Waterfall Life Cycle and prototyping models, while simultaneously adding a new element: risk analysis. The model divides the software engineering space into four quadrants: planning, risk analysis, engineering, and customer evaluation.

Appendix B

Overview of EPA's System Life Cycle Management Phases

EPA's system lifecycle consists of five phases. The objective of each phase is to ensure sound project planning and management practices throughout the system lifecycle. Figure B-1 depicts these phases and provides a context in relation to EPA's enterprise architecture, capital planning and investment control, and security processes. The diagram also identifies the principal executive-level reviews (control gate reviews) that apply during the system lifecycle.

Figure B-1: EPA's Lifecycle Management Framework



Source: EPA's System Life Cycle Management (SLCM) Procedure (2121-P-01.0), June 28, 2007, p. 8.

Appendix C

Agency Response

October 12, 2010 (date stamped)

MEMORANDUM

SUBJECT: Response to the Office of the Inspector General Draft Audit Report, "Improvements Needed in EPA's Efforts to Replace Its Core Financial System," Project Number OMS-FY10-0006, dated September 9, 2010

FROM: Barbara J. Bennett /s/
Chief Financial Officer

TO: Rudolph M. Brevard
Director, Information Resources Management Assessments
Office of Missions Systems
Office of Inspector General

Thank you for the opportunity to review and comment on the draft audit report entitled, "Improvements Needed in EPA's Efforts to Replace Its Core Financial System, Project Number OMS-FY10-0006." I would like to express my appreciation to you and your staff for working collaboratively with OCFO to ensure the report's factual accuracy and provide recommendations to improve OCFO processes.

The Office of Inspector General issued the following two recommendations. OCFO's responses follow each recommendation:

Report Recommendation 1:

- ***Develop and implement formal procedures for future projects to ensure that:***
  - ***the requirements document(s) and test plans are authorized by executive management (as a part of the definition phase's requirements subphase) prior to approving the system to move into the next phase of the lifecycle, and***
  - ***any subsequent changes to the requirements document(s) and/or test plans are authorized by executive management prior to making changes to the design of the system.***

OCFO Response:

OCFO agrees that the management control processes could have been more structured as the project progressed and has taken steps to formalize its current requirements and management approval procedures. However, at no time did OCFO's management approval process compromise the development of system requirements and test plans to provide reasonable assurance that EPA will achieve its desired results.

The draft report accurately described that revisions/changes made in the System Lifecycle Management (SLCM) document and the related control gate impacted how OCFO progressed in developing its new core financial system. OCFO used its program management support contractor to review the changes that occurred from the initial SLCM document in place at the beginning of the contract to its current version. The contractor identified the specific actions OCFO had taken that were different than the required actions in the initial SLCM. The contractor further prepared a justification for an approval waiver, if warranted. Based on an Independent Verification and Validation (IV&V) conducted by the Office of Environmental Information (OEI), a waiver was deemed unnecessary because OCFO's actions and approach did not materially compromise or change the eventual decision. The program management report for OCFO and the IV&V report from OEI are available for review.

The draft report portrayed the OCFO system requirements approval process less favorably. OCFO took great strides to ensure that requirements were complete, measureable, and testable. OCFO documented and tracked requirements in a matrix that was reviewed and approved by senior management at key points. The draft report accurately identified OCFO's progress in reviewing and revising its requirements as the project progressed. For example, OCFO worked with EPA's program and regional office subject matter experts to identify and confirm that approximately 1,400 requirements satisfied EPA, Financial Management Line of Business (FMLoB), and Financial Systems Integration Office (FSIO) requirements. This baseline set of requirements was an attachment to the formal OCFO acquisition in the Request for Proposal. Due to subsequent changes to FSIO requirements and new Momentum capabilities, OCFO continued its review and approval of system requirements. Rather than submitting a revised list of all the requirements for management's approval, EPA separated the requirements into two categories: (1) no additional changes and/or approvals needed, and (2) changes that required management approval through the OCFO Change Control Board. Although the draft report states that OCFO proceeded with the design subphase without obtaining executive management approval, OCFO based the design phase on requirements that did not require additional management approvals.

To improve the requirements approval process and procedures for current and future OCFO projects, OCFO is developing a checklist to identify, track, and monitor those actions that require executive management approval. The OCFO project manager will see that the checklist is regularly utilized and maintained. OCFO will train its control account managers and other subject matter experts working on the project on the procedures for obtaining executive management approval over changes to requirements and test plans.

Report Recommendation 2:

- ***Develop and implement formal procedures to ensure that the test plan associated with PAT or any other test includes criteria that define what constitutes pass or failure to ensure that management has a basis for making go/no-go decisions.***

OCFO Response:

OCFO agrees that it should have followed a more formal process in identifying and documenting its PAT plan and the associated criteria for formulating a "go/no go" decision on the project. However, at no time did the PAT "go/no-go" criteria: (1) incorrectly influence management's decision to accept or not accept the Momentum product, (2) result in a system that could not meet management's expectations and EPA's needs, and (3) result in the selection of a product that does not comply with applicable federal and EPA requirements.

OCFO worked with EPA's program and regional office subject matter experts to test and verify whether the Momentum product could meet EPA's critical requirements. The Momentum product was a commercial-off-the-shelf product that is in place in other government agencies. Accordingly, OCFO was fully aware that the Momentum product was an established suite and relied on the success/failure criteria established by EPA's subject matter experts during their assessment of performance against test scripts during the PAT testing. The Momentum contractor developed the test scripts with input from the EPA experts. In some cases, the test script failed due to a missing step and not because the Momentum software could not meet the EPA requirement. Accordingly, EPA allowed some test scripts to be revised and retested. The EPA control account manager made the decision to develop the "go/no-go" decision criteria based on input from the EPA subject matter experts. OCFO documented the PAT results and made a presentation to the Administrative System Architecture Steering Committee (ASA SC) that serves as the Agency-level governance body for the project. Based on the information provided, the ASA SC made the recommendation to the Deputy CFO, as the project sponsor, to accept the Momentum product and move forward with the project.

To improve its process for defining "go/no-go" decision making criteria, OCFO will develop processes and revise existing procedures to apply more rigorous use of test script results in driving "go/no-go" decisions on current and future projects. We have done this with FSMP and will use the criteria in obtaining executive management go/no-go decisions. The OCFO project manager will see that decision making criteria are developed based on test script pass/fail metrics and approved prior to the start of the work. OCFO will train its control account managers and other subject matter experts working on the project on the appropriate evaluation of projects based on test script pass/fail measures. At present, EPA has applied the OIG recommendation and established success/failure metrics and acceptance criteria for the upcoming User Acceptance Testing phase of the Core Financial System implementation.

Appendix D

Distribution

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