




Office of Inspector General
Pension Benefit Guaranty Corporation

January 11, 2018

TO: Cathy Kronopolus
Chief of Benefits Administration

CC: Bob Scherer
Chief Information Officer

Alice Maroni
Chief Management Officer

FROM: Robert Westbrooks 
Inspector General

SUBJECT: Issuance of Final Special Report No. SR-2018-10/RV-17-120:
Review of the Acquisition and Performance of Spectrum 4

We received hotline complaints detailing concerns related to Spectrum 4's acquisition and performance. We initiated a limited scope review to determine the legitimacy and severity of these issues. This special report communicates the results of our review. It contains public information and will be posted in its entirety on our website and provided to the Board and Congress in accordance with the Inspector General Act.

Summary

We substantiated some of the issues, and they warrant management's attention. Specifically, we found the deployment of Spectrum 4 resulted in increased errors/variances, which required PBGC to release ten versions in attempts to fix the issues causing the errors. We also found that the deployment of Spectrum 4 resulted in slower day-to-day functioning of the system. This slowness has impacted users' ability to complete tasks and frustrated users. (We did not substantiate other allegations, including improper de-scoping of requirements, improper delays, improper monitoring of the contract, and breach of contract training requirements.) In response to the issues we substantiated, we recommend that management perform and document an Integrated Product Team led "lessons learned."

Additionally, in “Other Matters,” we report our concerns regarding IT system acquisition planning and administration. We will include those concerns, as well as our findings regarding Spectrum 4, in our annual top management challenges and audit work planning.

Background

Within PBGC’s Office of Benefits Administration, the Benefit Payment Division (BPD) is responsible for coordinating the transmission of payment information between PBGC and the paying agent. Spectrum is a web-based application that allows BPD to manage customer pension benefits and data. BPD’s goal is to use Spectrum 4 to eliminate legacy systems and consolidate data from other systems to send payment information to PBGC's paying agent.

In 2011, PBGC awarded the Indefinite Delivery Indefinite Quantity (IDIQ) contract. The contract included two main responsibilities: (1) the development, modernization, and enhancement (DME) of Spectrum 4 and (2) the operations and maintenance of the Spectrum system. The contract was awarded with a base year plus four option years and a ceiling of \$30 million. The contract timeline estimated completion of the last option year in June 2016.

The purpose of the DME portion of the IDIQ contract was to reengineer functionality from legacy applications to enable users to process payments within one application – Spectrum 4. Additionally, Spectrum 4 was to streamline the reconciliation process and expedite the correction of errors by BPD. PBGC awarded four task orders to complete the DME portion of the contract at a cost of approximately \$13.3 million. PBGC awarded the first task order in September 2011 and the last task order concluded in February 2016. Under the DME portion of the contract, various versions of Spectrum 4 were developed, tested, and released. The final Spectrum 4.1 releases occurred in November of 2015.

Hotline Concerns

The hotline contacts detailed various concerns related to the DME portion of Spectrum 4. Our office conducted an initial assessment and performed this limited scope review to determine whether: (1) the enhancement resulted in system error increases and ongoing system issues; (2) the enhancement slowed the system’s speed and performance; (3) one of the task orders had an improper reduction in scope with no cost offset; (4) system acquisition was improperly delayed; (5) the contract was improperly monitored; and (6) specific training deliverables did not meet contract requirements.

Details

1. *Did Spectrum 4 result in increased system errors?*

We substantiated the concerns that the Spectrum 4 deployment in January 2016 resulted in increased errors and ongoing problems with the system.

We determined that PBGC deployed Spectrum 4, even though it observed higher than planned error rates in the testing phase. Post deployment, PBGC has had to release ten versions in attempts to fix the issues causing the errors. These fixes have resulted in a decline of the errors. Nonetheless, the system is still experiencing issues and releases have been issued and others are being developed to fix the problems.

BPD processes participant payments and ensures the participant's information transferred to the paying agent is accurate and complete. Throughout each month, multiple file transfers occur between PBGC and the paying agent. During these file transfers errors are identified and PBGC resolves them prior to payment. There are three types of errors discussed in the report: (1) transmission and acknowledgement, (2) trial balance, and (3) post balancer.

We compared reported errors from the last test cycle in October 2015 to reported errors post deployment in January 2016. (Table 1) We determined that all three error types initially increased post deployment, with transmission and acknowledgement errors increasing most dramatically from 608 to 819,693.

Table 1: Comparison of Errors from the Last Test Cycle to Post-Deployment ¹

Error Type	Errors as of October 2015 Test Cycle	Errors as of January 2016
Transmission and Acknowledgement	608	819,693
Trial Balance	222	19,117
Post Balancer	106	203

Source: OIG analysis of PBGC Executive Briefing (October 2015).

¹ PBGC provided clarification on the January 2016 errors stating that approximately 817,000 transmission and acknowledgement errors were due to a single issue - a result of files being truncated due to an Oracle update. Almost half of the trial balance errors were due to a single issue with data conversion – the assignment of payment identification numbers. The majority of the remaining trial balance errors were attributed to the one time conversion of the entire database.

We analyzed contract criteria to determine the severity of these errors. For the DME task orders, PBGC identified “Go/No Go” or clean criteria to assist them in assessing whether the system’s error rates were at an “Acceptable” level for deployment, i.e., transmission/acknowledgement errors of 210 or less; trial variances of 150 or less; and post balancer variances of 85 or less. The clean criteria were to be demonstrated for three cycles prior to implementation. Per the clean criteria, the pilot cycles could still be deemed "clean" by management if there was a consistent decline of errors and if the errors were not substantively worse than the “Acceptable” level.

We analyzed system error records and compared the results of Spectrum 4’s test cycles against the clean criteria. We found that all error levels decreased through the testing cycles. We observed, for example, 40,613 transmission and acknowledgement errors in the April 2015 test cycle, but these errors were reduced to 608 in the October 2015 test cycle. This number was still over the clean criteria acceptable level of 210; however, only 28 of the transmission and acknowledgement errors required action by PBGC. The other errors required data fixes by the contractor because PBGC users were not able to address them. At the end of testing, the three error types were still above the clean criteria level. By deploying Spectrum 4, management accepted these error rates.

We note that as of September 2017, transmission and acknowledgment and post balancer errors decreased below the clean criteria level. Trial balance errors remained slightly above the clean criteria level.

Due to the increase in errors post-deployment, PBGC has released ten versions of Spectrum since February 2016 to address 119 data fixes. These fixes affected records for over 14 million participants. There are 46 outstanding issues. PBGC has plans to issue 2 releases in 2018 to address 5 of the issues; this leaves 41 outstanding issues to be addressed.

2. Did the project result in slower system performance?

We substantiated the allegation that the deployment of Spectrum 4 resulted in slower day-to-day functioning of the system. Spectrum is a web-based application. Its users navigate between multiple screens to perform their daily duties. Both users and acquisition team members reported to OIG they were frustrated with slow system responsiveness during day-to-day use. This impacts the users’ ability to timely complete tasks. During our review, we observed users waiting several minutes to open screens within the system.

Based on our review, we determined that the contract documents for Spectrum 4.0, and later versions, do not contain specific system responsiveness requirements. The contract documents for Spectrum 1.0 state: "For page loads, PBGC's acceptable response time is less than 5 seconds." We were unable to identify any similar requirements for Spectrum 4.0 or higher. Based on users' feedback and our observations, we concluded that page loads were not occurring at less than 5 seconds. PBGC officials told the OIG review team that the contract for Spectrum 4.0 and later versions do not include requirements related to system response times since the original performance requirements from Spectrum 1.0 did not change.

We determined that after the releases of Spectrum 4.0 and Spectrum 4.1, the Spectrum team received at least 149 service desk tickets related to Spectrum performance/slowness issues. The Spectrum team deployed subsequent releases to address the slowness and performance issues. Additionally, in November 2016, PBGC established a bi-weekly meeting with production operations teams to discuss application performance/slowness issues and address them. These meetings identified the need to restart the Spectrum and other application servers every Wednesday night to alleviate slowness related to database connections and caching. Also, PBGC plans to further address slowness in future Spectrum releases.

3. Was the IDIQ first task order improperly de-scoped to reduce requirements with no cost offset?

It was alleged that the IDIQ's first task order was improperly de-scoped to delete the requirement to decommission legacy applications. We found that PBGC, in fact, modified the IDIQ contract's first task order and reduced the scope of work required without a cost offset; however, we determined that the change in scope was due to the official contract file inadvertently containing the wrong Statement of Objectives. Emails from the Contracting Officer (CO) and the Contracting Officer Representative (COR) verified this error. To correct the error, PBGC modified the contract to incorporate the correct Statement of Objectives. We reviewed the IDIQ contract to verify that the contract was not intended to decommission the legacy applications. Although planning and draft documents in the contract file discuss the decommissioning of the legacy systems, the final contract does not contain this language.

4. Was Spectrum 4 delivered on time in accordance with contract requirements?

It was alleged that Spectrum 4 was not delivered, as required, within 18 months of the October 5, 2011 contract award date. We did not substantiate this allegation. We reviewed contract documents and determined that the performance period outlined in the contract was June

2011 to June 2016. This includes a base year plus four option years. The final task order was completed in February 2016, within the established IDIQ timeline.

5. Did PBGC improperly monitor the Spectrum 4 contract?

We did not substantiate the allegation that PBGC did not properly monitor the Spectrum contract. We found the COR, per the COR's letter of designation, monitored the contractor's work to verify that contract requirements were met. The COR duties include, but are not limited to, providing the CO with quarterly reports detailing the contractor's performance and informing the CO promptly whether services delivered by the contractor conform fully with the contract requirements. We obtained 16 of the 19 required COR quarterly reports to the CO for 2012-2016. (Reports from Q4 of 2013, Q2 of 2014, and Q4 of 2014 are missing. The current COR was not serving at that time and could not locate them.) The quarterly reports show that PBGC monitored the contractor's work and verified that the contractor met contract requirements.

Also, we found PBGC monitored the performance of three Spectrum 4 task orders. The Information Technology Solutions Life Cycle Management deliverables show that PBGC's monitoring of the first task order resulted in the contractor's development of the Project Charter, Project Management Plan, Lessons Learned, Business Process Model-As is and Business Process Model-To Be. In particular, the lessons learned are vetted through PBGC for input and concurrence. A second PBGC task order resulted in the contractor's development of deliverables for, among other things, a Design Document, User Acceptance Testing, and Deployment Guide. During the second task order, PBGC monitoring identified a need to mitigate risks associated with untimely or inaccurate payments. PBGC issued a letter of concern to the contractor, withheld the award fee, and requested a Corrective Action Plan to address the contractor's performance issues. To mitigate the identified risks, PBGC released Spectrum 4 in a test mode to correct legacy data issues. Finally, PBGC oversaw Spectrum's acquisition and implementation through regular executive steering committee meetings and Integrated Product Team meetings.

6. Did specified training deliverables meet contract requirements?

We did not substantiate the allegation that the contractual requirement of hands-on system training was not met. We found that although many users expected hands-on training and a live demonstration of the system, the contract does not require these things. System users were, instead, provided training through a PowerPoint presentation.

Other Matters

During our review, a PBGC official told the review team that management “underestimated the amount of plan data to be processed by Spectrum.” This comment offers a possible explanation for the increases in errors and reduced system speed. In addition to the substantiated allegations above, the OIG review team identified additional concerns relating to a lack of overall understanding of the needs of the system at the time of solicitation, an increased reliance on contract support as the project progressed, and a lack of transparency of cost and deliverables. We believe these issues collectively warrant the performance and documentation of an Integrated Product Team “lessons learned.”

Our office has previously identified IT modernization and contract oversight as two of the three top management challenges facing PBGC. In our Semiannual Report to Congress we noted:

Transparency of the cost and deliverables of individual projects that make up PMP modernization remains a concern. Despite the critical nature of these systems and the millions of dollars invested, there is not enough information about each system’s project costs in the public domain to provide for meaningful public accountability. PBGC is highly-dependent on contract staff to conduct its work, which includes providing IT support, developing and assessing internal controls, and calculating and paying pension benefits.

The Government Accountability Office has also identified IT acquisitions and operations as a high risk to the government. In its 2017 High Risk Report, GAO noted:

Although the executive branch has undertaken numerous initiatives to better manage the more than \$80 billion that is annually invested in information technology (IT), federal IT investments too frequently fail or incur cost overruns and schedule slippages while contributing little to mission-related outcomes. These investments often suffered from a lack of disciplined and effective management, such as project planning, requirements definition, and program oversight and governance. In many instances, agencies have not consistently applied best practices that are critical to successfully acquiring IT[.] ... Agencies continue to have IT projects that perform poorly. Such projects have often used a “big bang” approach — that is, projects are broadly scoped and aim to deliver functionality several years after initiation.

Our review substantiated some concerns that we believe were driven by IT acquisition risks as identified by GAO and the OIG. Additional improvement in the Spectrum acquisition may be

realized with the performance of a “lessons learned” by the Integrated Product Team. The recommendation below will help ensure that PBGC continues to identify and incorporate improvements in the acquisition process. As a general practice, PBGC may consider incorporating the Integrated Product Team “lessons learned” into other IT acquisitions, given the high risks identified by the GAO and the OIG’s management challenges.

Recommendation

We recommend the Office of Benefits Administration:

1. Perform and document an Integrated Product Team led “lessons learned.” (OIG Control Number OBA-3)

PBGC’s Response and OIG’s Evaluation

Resolved. PBGC agreed with the recommendation and provided actions to complete this recommendation by March 31, 2018. Closure of this recommendation can occur when PBGC implements the Spectrum 4 retrospective meeting with the Integrate Project Team. For these retrospective meetings, the Office of Benefits Administration will partner with the Office of Information Technology, when needed, to identify and document any remaining issues or concerns of federal staff related to the Spectrum 4 release.

cc: Tom Reeder, Director
Steve Pawela, Division Manager, Actuarial Services and Technology Department
Marty Boehm, Director, Corporate Controls and Reviews Department
Nicole Puri, Risk Management Officer
Department of Labor Board staff
Department of the Treasury Board staff
Department of Commerce Board staff

Appendix I: Objective, Scope, and Methodology

Objective

Our objective was to determine the legitimacy and severity of hotline complaints, and to determine if management had planned or taken any corrective action.

Scope

To answer our objective, we reviewed contract documents related to the acquisition of Spectrum 4, awarded on June 7, 2011. We conducted this review from April through December 2017 in Washington, DC.

Methodology

To accomplish our objectives, we reviewed applicable regulations and PBGC policies and procedures. We reviewed the IDIQ contract for Spectrum and the corresponding task orders. We also reviewed supporting contract documents, such as COR Quarterly reports, the Requirements Traceability Matrix, contract modifications, and Executive briefings on the system. Last, we interviewed procurement staff and users of the system.

We conducted the review under the authority of the Inspector General Act of 1978, as amended, and according to the Quality Standards for Inspections issued by the Council of the Inspectors General on Integrity and Efficiency.

Appendix II: Management Response



January 10, 2018

To: Robert Westbrooks
Inspector General

From: Scott G. Young 
Director, Actuarial Services and Technology Department (ASTD)

Subject: PBGC's Response for Incorporation into the Office of Inspector General
Special Report – Review of the Acquisition and Performance of Spectrum 4

On behalf of PBGC's Office of Benefits Administration (OBA), I am pleased to respond to the findings and recommendation in the draft Office of Inspector General Special Report – Review of the Acquisition and Performance of Spectrum 4.

OBA agrees with the findings and recommendation contained within the draft report. OBA, partnering with the Office of Information Technology as needed, will conduct a Spectrum 4.0 retrospective (i.e. "lessons learned") session with the Integrated Project Team. With this approach, OBA will be able to identify and document any remaining concerns and issues from federal staff related to the Spectrum 4.0 release. OBA will use the findings from the report, as well as the lessons identified by the IPT to improve future system development efforts. OBA anticipates completing the recommendation by March 31, 2018.

Thank you for providing us the opportunity to respond to the draft report. If you have questions or comments, please contact me at extension 6816.

cc: Cathy Kronopolus
Bob Scherer
David Foley
Vidhya Shyamsunder

Appendix III: Acronyms

BPD	Benefit Payment Division
CO	Contracting Officer
COR	Contracting Officer Representative
DME	Development, Modernization, and Enhancement
GAO	Government Accountability Office
IDIQ	Indefinite Delivery Indefinite Quantity
IT	Information Technology
OIG	Office of the Inspector General
PBGC	Pension Benefit Guaranty Corporation

Appendix IV: PBGC OIG Contact and Staff Acknowledgement

PBGC OIG Contact

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westbrooks.robert@pbgc.gov.

Staff Acknowledgement

In addition to the contact named above, Brooke Holmes,
Audit Manager; Tyson Lee, Auditor-In-Charge; and Tiara
Grotte, Auditor, made key contributions to this report.