November 21, 2019

**MEMORANDUM FOR**:    Dr. Steven D. Dillingham
Director
U.S. Census Bureau

**FROM**:    Carol N. Rice
Assistant Inspector General for Audit and Evaluation

**SUBJECT**:    *Management Alert: Critical 2020 Census Systems Failed to Meet Peak Recruiting Demands During Testing*
Final Memorandum No. OIG-20-010-M

Attached is a management alert on the U.S. Census Bureau's (the Bureau's) Decennial Applicant Personnel and Payroll System and the Census Hiring and Employment Check system. The issues regarding these systems came to our attention during our audit fieldwork related to the 2020 Census Performance and Scalability Test. Our ongoing objective for that audit is to determine whether the Bureau completed phases 1 through 4 in accordance with the 2020 Census Performance and Scalability Test plan phase requirements and schedule. During our fieldwork, we observed issues with these systems that present a risk to the successful completion of the 2020 Census program.

Consistent with the Inspector General Act of 1978, as amended (IG Act),[1] we are notifying Bureau leadership of the potential risks that could affect the 2020 Census Performance and Scalability Test and overall 2020 Census program.

We are not requesting a formal response to this management alert, as the key issues discussed in it were briefed to cognizant Departmental officials in advance of issuance. This management alert will be posted to our public website. We plan to include the information in this memorandum in an audit report to be issued at a later date.

If you have any questions or concerns about this memorandum, please contact me at (202) 482-6020 or Terry Storms, Division Director, at (202) 482-0055.

Attachment

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[1] The IG Act establishes that offices of inspectors general will "provide a means for keeping the head of the establishment and the Congress fully and currently informed about problems and deficiencies relating to the administration of such programs and operations and the necessity for and progress of corrective action." 5 U.S.C. App., § 2(3).

## Key Issue

The Decennial Applicant Personnel and Payroll System (DAPPS) and the Census Hiring and Employment Check (CHEC) system failed phases 3 and 4 of the 2020 Census Performance and Scalability (P&S) Test and, as of July 8, 2019, were unable to perform at the scale needed to support decennial census peak recruiting. According to U.S. Census Bureau (Bureau) personnel, these systems failed because of either inadequate infrastructure and/or inefficiencies in the software. Personnel from the Bureau also stated that P&S retesting will occur in November 2019; however, peak recruiting—or the time during which DAPPS and CHEC will experience high demands—will begin in January 2020, which leaves little time to resolve any additional issues discovered during retesting. In addition, the Bureau does not have an adequate, documented contingency plan in place in case the proposed solutions do not work.

## Proposed Actions for Change

To address the potential impact on the 2020 Census program, the Bureau should formalize a contingency plan that includes alternative methods to ensure employees are cleared, hired, processed, and paid in a timely manner.

## Background

According to the Bureau, P&S testing will help (a) enable mission objectives by ensuring that systems process transactions within the requisite time frames; (b) demonstrate the maturity, scalability, and stability of systems to minimize rework and schedule delays due to system failures and performance issues; and (c) maximize user satisfaction through operational performance and quality of service delivered. All P&S testing activities are performed by the Technical Integrator contractor in support of the 2020 Census program.

Performance testing will help the Bureau ensure the quality of decennial census operations throughout the design, implementation, and operation phases by determining how a system performs under a specific workload. Scalability testing is a subset of Performance testing, which determines how a system scales with an increasing workload. The P&S Test uses a four-phased approach in which pre-test activities are carried out in phase 1 and testing is conducted in phases 2, 3, and 4.

# Our Observations to Date

According to the P&S Test plan, the final phase of Peak Recruiting P&S testing (i.e., phase 4) was scheduled to begin in April 2019 and conclude in June 2019. However, information technology infrastructure issues[2] caused delays and the contractor did not complete testing until July 2019. Following the completion of phase 4 testing, we requested the Test Analysis Report (TAR), which details findings, performance summaries, and the systems' ability to scale up.[3] The TAR indicated that DAPPS[4] and the CHEC system[5] did not meet phases 3 and 4 peak recruiting performance goals.[6] According to Bureau personnel, the failures for both systems were due to either inadequate infrastructure and/or inefficiencies in the software, although each system was affected differently.

Specifically, DAPPS failed five out of the six test scenarios because it could not meet targeted selection, hiring, and training transaction rates. Bureau personnel informed us that issues with third-party software caused DAPPS to fail those five test scenarios. In order to ensure that this system will be able to handle the full, anticipated workload, the Bureau must first conduct additional work to fix system defects, and then the contractor must follow up and conduct additional P&S testing. The software solution for DAPPS is expected to be delivered in November 2019, and the contractor plans to conduct its additional testing in November 2019 (i.e., after the solution is received from the vendor). This will result in an updated TAR in December 2019.

In addition, CHEC failed all five test scenarios because the system used 100 percent of its processing power, even though the targeted threshold was less than 70 percent. The solution for the CHEC system will require an update to the code that will be performed by the systems team at the Bureau. The update is expected to be completed within the same timeframe as the DAPPS solution or earlier.

The Bureau does not have a documented contingency plan in place in case the proposed solutions do not work. Bureau officials stated that it could limit the number of concurrent users and increase the expected amount of time needed to process transactions.

However, during the periods of peak recruiting (January and March 2020) these systems must be able to scale to meet the increased demands of nonresponse followup (NRFU),[7] which is the most expensive decennial census operation. The success of NRFU, like all other decennial operations, rests on the implementation of certain innovations, including automated administrative functions for clearing, hiring, processing, and paying staff efficiently in order to reduce staffing requirements and control cost. The Bureau's proposed solution deviates from expected innovations and introduces the

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[2] Delays to the test start date were caused by discrepancies in the cluster and server configuration. Other deployment and environment issues were discovered during testing that required an extension to the period of testing.

[3] The Bureau provided a draft TAR that included test results, but stated that the finalized TAR was pending discussion of how to handle the additional testing needed to resolve the observed performance issues.

[4] DAPPS supports selection, hiring, personnel actions, time and expense processing, and payroll administration for temporary 2020 Census employees.

[5] The CHEC system automates clearance processing of all Bureau personnel.

[6] However, according to the Bureau, the systems were able to support the smaller address canvassing operation.

[7] According to the Bureau's *2020 Census Life-Cycle Cost Estimate*, the address canvassing operation only had to select 65,127 applicants; however, NRFU will require the selection of 591,925 applicants.

risk that it would not be able to perform such tasks as expected and hire the required number of NRFU staff in time to conduct the operation efficiently and control cost.

## Our Future Work

The information in this management alert, as well as any actions taken by the Bureau in response to this memorandum, will be included in a later audit report. This management alert will be posted to our public website.