OFFICE OF INSPECTOR GENERAL
UNITED STATES POSTAL SERVICE

Small Package Sorting System Performance and Functionality at the West Valley Processing and Distribution Center

Audit Report

Report Number
MI-AR-15-006

August 24, 2015

OFFICE OF INSPECTOR GENERAL
UNITED STATES POSTAL SERVICE

Highlights

The Small Package Sorting System (SPSS) machine sorts packages that weigh 20 pounds or less and are processed at U.S. Postal Service facilities.

Background

The Small Package Sorting System (SPSS) machine sorts packages that weigh 20 pounds or less and are processed at U.S. Postal Service facilities. The Postal Service saves labor costs as packages move from manual operations to the SPSS machine. The SPSS program is one of the major activities supporting Delivering Results, Innovation, Value, and Efficiency (DRIVE) Initiative 43 – Building a World-Class Package Platform.

The Postal Service identified four performance metrics to evaluate the program's success:

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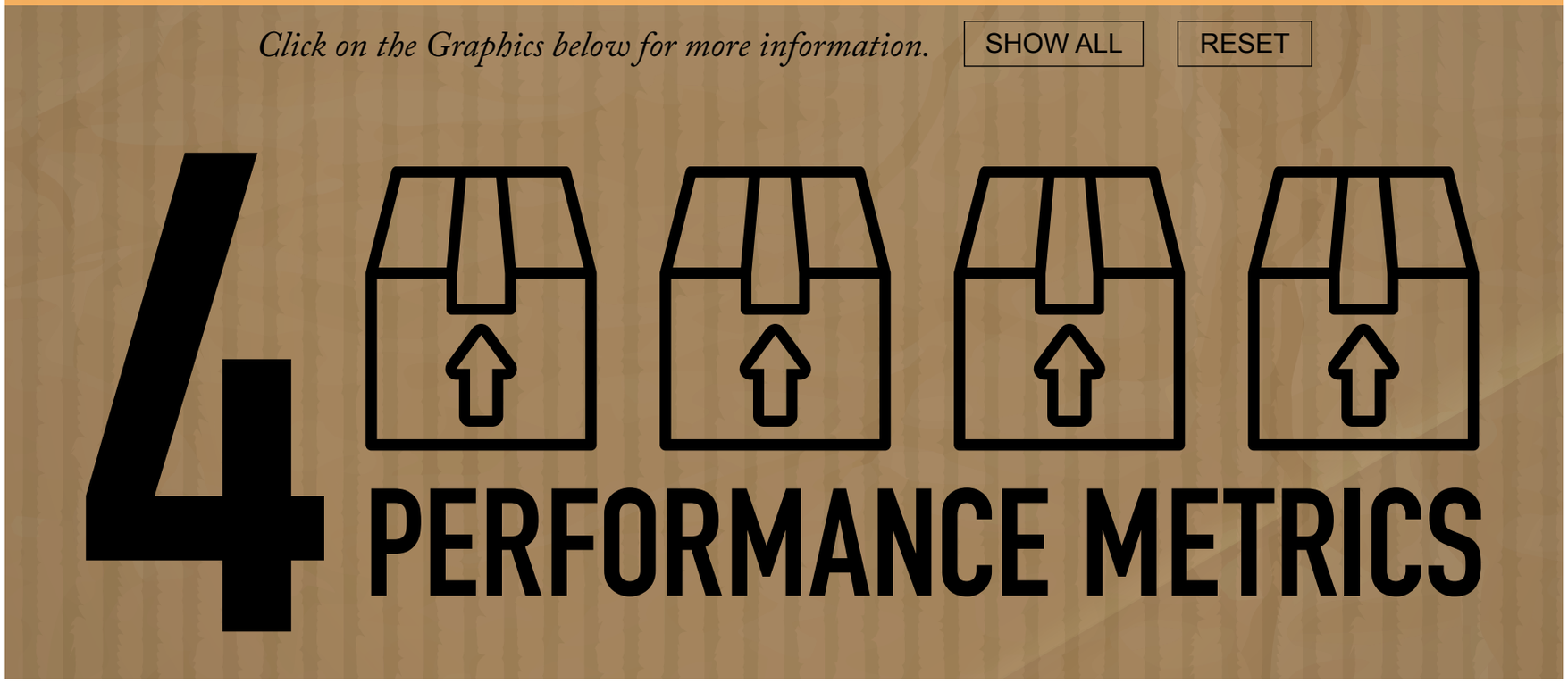

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In March 2014, the Postal Service approved the purchase of five SPSS machines for about $[redacted] million for evaluation in Arizona, California, Florida, New York, and Texas. In January 2015, the Postal Service approved $[redacted] million to purchase and deploy an additional 26 SPSS machines. This occurred before the Postal Service fully deployed the first five machines. At the time of this audit, the SPSS machine at the West Valley Processing and Distribution Center (P&DC) was the only system operating.

Our objective was to evaluate whether the performance and functionality of the SPSS machine at the West Valley P&DC met stated expectations. We plan to conduct future audit work on overall SPSS deployment, performance, and functionality.

What The OIG Found

The SPSS machine at the West Valley P&DC is not achieving the projected performance and economic goals in support of DRIVE Initiative 43. It is exceeding the [redacted] percent acceptance rate (how well the machine reads the packages) goal by [redacted] percent because an upgraded optical character reader was installed on it. However, the SPSS machine did not meet the projected performance metrics for daily machine runtime (amount of time the machine is in use each day) and package processing volume (number of packages fed through the machine). The average daily machine runtime is [redacted] percent less than projected and the average package processing volume is [redacted] percent less than projected. We found the site has enough packages to support running the machine for more time each day.

The shorter machine runtime and lower volume impact projected and actual labor savings from automation. Between February 3 and April 30, 2015, labor savings were $[redacted] less than the projected [redacted] (30 percent less) because the SPSS machine did not meet the projected runtime of [redacted] hours. Management stated this issue is occurring because the site is not receiving packages early enough to run the machine on additional tours. Also, West Valley P&DC management is not ensuring that employee time clock rings are accurate. As a result, there is no way to determine if the West Valley P&DC is achieving projected labor savings of [redacted] hours per year. This issue is occurring because the operational supervisors are not ensuring staff is clocking into the correct job function.

Correcting these issues at the West Valley P&DC and preventing them at future sites will help achieve the labor savings goal and support DRIVE Initiative 43.

What The OIG Recommended

We recommended management establish optimum runtimes and processed package volumes for each deployed SPSS machine and establish a process for all non-deployed SPSS sites to maximize machine use and reduce manual parcel sorting. We also recommended management establish a process to ensure that SPSS employee clock rings are properly completed so labor costs can be accurately attributed and measured.

Transmittal Letter

OFFICE OF INSPECTOR GENERAL
UNITED STATES POSTAL SERVICE

August 24, 2015

MEMORANDUM FOR: MICHAEL J. AMATO
VICE PRESIDENT, ENGINEERING SYSTEMS

LINDA M. MALONE
VICE PRESIDENT, NETWORK OPERATIONS

E-Signed by Michael Thompson
ERIFY authenticity with eSign Deskto

FROM: Michael L. Thompson
Acting Deputy Assistant Inspector General
for Technology, Investment and Cost

SUBJECT: Audit Report – Small Package Sorting System Performance and Functionality at the West Valley Processing and Distribution Center (Report Number MI-AR-15-006)

This report presents the results of our audit of the Small Package Sorting System Performance and Functionality at the West Valley Processing and Distribution Center (Project Number 15TG018MI000).

We appreciate the cooperation and courtesies provided by your staff. If you have any questions or need additional information, please contact Sean D. Balduff, director, Major Investments, or me at 703-248-2100.

Attachment

cc: Corporate Audit and Response Management

Table of Contents

Findings

The SPSS machine at the West Valley P&DC is not achieving the projected performance and economic impacts in support of DRIVE Initiative 43.

Introduction

This report presents the results of our audit of the Small Package Sorting System (SPSS) Deployment and Functionality (Project Number 15TG018MI000). Our objective was to review and evaluate whether the performance and functionality of the SPSS met stated expectations. See Appendix A for additional information about this audit.

The SPSS program is one of the major activities supporting Delivering Results, Innovation, Value, and Efficiency (DRIVE) Initiative 43 - Building a World-Class Package Platform. The SPSS machine is a commercial-off-the-shelf (COTS) sorter for packages weighing 20 pounds or less.[1] The U.S. Postal Service approved $[redacted] million to purchase and deploy five SPSS machines for evaluation purposes and identified four performance metrics to evaluate the program's success:

- Pieces fed per workhour
- Pieces fed per day
- Machine acceptance rate
- Pieces fed per workhour charged

In January 2015, the Postal Service approved $[redacted] million to purchase and deploy an additional 26 SPSS machines. This occurred before the Postal Service fully deployed the first five test and evaluation machines. At the time of this audit, the SPSS machine at the West Valley Processing and Distribution Center (P&DC) was the only machine operating. Between February and April 2015, the Postal Service deployed four additional SPSS machines; however, this audit did not evaluate those machines because there was limited operational data to evaluate throughput[2] and workhours.

The DAR projected that the SPSS machine would cost less than purchasing new Automated Package Processing System (APPS) machines, which the Postal Service has used for almost 10 years. The new sorters will save labor costs as packages move from manual operations to automation. The Postal Service projected deployment of the five SPSS machines would provide $[redacted] million in gross labor savings through fiscal year (FY) 2025 with $[redacted] million in net operational savings and a [redacted] percent return on investment (ROI).

Conclusion

The SPSS machine at the West Valley P&DC is not achieving the projected performance and economic impacts in support of DRIVE Initiative 43. The SPSS machine is exceeding the acceptance rate[3] goal of [redacted] percent by [redacted] percent and the Postal Service estimates the acceptance rate should increase [redacted] percent once the machine is connected to the remote encoding center.[4]

However, the SPSS machine did not meet the projected performance metrics for daily machine runtime and volume. The average daily machine runtime[5] is [redacted] percent less than projected and the average volume is [redacted] percent less than projected. The site has

1 *World-Class Package Program – Small Package Sorting System Test and Evaluation* decision analysis report (DAR), March 17, 2014, [redacted]
2 The average number of packages fed through the machine per hour.
3 Measures how well the machine reads the packages.
4 An off-site operation that uses advanced technology to assign barcodes to mailpieces that cannot be read by equipment at a mail processing facility.
5 The amount of time the machine is in use each day.

enough packages to support running the machine for more time each day. As a result, the SPSS machine saved $[redacted] less than the projected savings of [redacted] (30 percent less) from February 3 to April 30, 2015.

Further, management is not monitoring SPSS package operation employee time clock rings to track labor distribution code (LDC)[6] 14, which is the data needed to determine whether the system is saving a projected [redacted] workhours per year.

These issues occurred because the site was not receiving the packages early enough to run the machine on additional tours and West Valley P&DC management was not monitoring the employee clock rings to ensure proper labor attribution.

Correcting these issues at the West Valley P&DC and preventing them at future sites will help the Postal Service support DRIVE Initiative 43 and achieve its labor savings goal.

Meeting Performance Metric Goals

The SPSS machine is exceeding the acceptance rate goal of [redacted] percent by [redacted] percent because an upgraded optical character reader was installed on the machine. The manager of Package Technology estimates the acceptance rate should increase an additional [redacted] to [redacted] percent once the SPSS machine is connected to the remote encoding center. The successful and improving acceptance rate can help increase throughput rates.

The SPSS machine did not meet the projected performance metrics for daily machine runtime and volume at the West Valley P&DC. Specifically, the average daily machine runtime is [redacted] percent less than projected and the average daily volume is [redacted] percent less than projected. There are enough packages available at the site to benefit from increasing the machine's runtime (see Table 1 for volume details).

Table 1: SPSS Volume Analysis

	West Valley Projection	West Valley Actual[7]	Difference	% Difference
Average Daily Volume	[redacted]	[redacted]	[redacted]	[redacted]
Average Daily Runtime	[redacted]	[redacted]	[redacted]	[redacted]
Total Manual Package Sorts				[redacted]
Average Daily Manual Package Sorts				[redacted]

Source: *World-Class Package Program – Small Package Sorting System Test and Evaluation* DAR, March 17, 2014, Web End-of-Run System (WebEOR), and Enterprise Data Warehouse (EDW) - Management Operating Data System (MODS).

West Valley P&DC management stated that they are not receiving the packages early enough to run the machine during additional tours. Currently, the SPSS machine is only running during the evening tour; however, management stated that they have a plan to change the arrival profiles to receive packages earlier and increase machine runtime.

6 A 2-digit number that describes the major work assignments at a Postal Service facility. LDC 14 is used to capture mail processing workhours for manual distribution.
7 Scope period was February 3 to April 30, 2015.

The Postal Service needs to understand the LDC 14 savings as they relate to the SPSS machine to measure success and understand why LDC 14 manual package sorting workhours increased compared to the same period last year.

The reduced machine runtime and volume impacts the projected and actual labor savings to be gained from automation. From February 3 to April 30, 2015, the SPSS machine saved [redacted] less than the projected labor savings of $[redacted] ([redacted] percent less) because it was running fewer than [redacted] hours a day.

The average hourly SPSS machine throughput exceeded the minimum throughput goal by [redacted] percent, but it is [redacted] percent less than the top range throughput goal (see Table 2 for hourly throughput analysis).

Table 2: Hourly Throughput Analysis

	Goal	Actual	Difference	% Difference
Minimum Goal	[redacted]	[redacted]	[redacted]	[redacted]
Top Range Goal	[redacted]	[redacted]	[redacted]	[redacted]

Source: World-Class Package Program – Small Package Sorting System Test and Evaluation DAR, March 17, 2014; 26 Small Package Sorting System Machines DAR, December 19, 2014, revised January 14, 2015; and WebEOR.

The projected throughput goal performance ranges are not based on performance test results, but on Engineering System's professional judgment. In addition, the projected West Valley P&DC average daily volume of [redacted] packages and the [redacted] average daily runtime result in an average hourly SPSS machine throughput of [redacted] pieces. This is about [redacted] percent less than the [redacted] minimum performance goal.

Managing Labor Savings

The manager of Technical Planning and Analysis, Engineering Systems, stated that the site has the primary responsibility to monitor clock rings. However, the SPSS package operation time clock rings are not being monitored to ensure data is captured to support the projected LDC 14 labor savings of [redacted] workhours per year. An operational productivity performance metric exists for the SPSS machine, but West Valley P&DC personnel are not clocking into the correct job function.

As a result, the Postal Service will not have accurate data to determine the extent to which the SPSS machine is helping to reduce LDC 14 workhours in the West Valley P&DC and whether projected labor savings are achieved. The Postal Service needs to understand the LDC 14 savings as they relate to the SPSS machine to measure success and understand why LDC 14 manual package sorting workhours increased [redacted] percent compared to the same period last year (SPLY). This increase in manual workhours caused a $[redacted] increase in labor costs while volume only increased [redacted] percent for the same period (see Table 3 for labor cost details).

Table 3: LDC 14 Labor Cost Analysis

	2015[8]	2014	Difference	% Difference
Total Hours	[redacted]	[redacted]	[redacted]	[redacted]
Labor Cost	[redacted]	[redacted]	[redacted]	[redacted]
Total Package Sorts	[redacted]	[redacted]	[redacted]	[redacted]

Source: WebEOR and EDW - MODS.

8 Workhours from February 3 - April 30, 2015, compared to the SPLY.
9 [redacted]
10 Based on the 2015 weighted labor rate for determining labor cost.

Recommendations

We recommend management establish optimum runtimes and processed packaged volumes for each deployed SPSS machine; establish a process for all non-deployed SPSS sites to maximize machine use and reduce manual parcel sorting; and establish a process to ensure that SPSS clock rings are properly monitored to enable tracking of labor savings.

We recommend the vice president, Network Operations:

1. Establish optimum runtimes and processed package volumes for the currently deployed Small Package Sorting System site to maximize machine use and reduce manual parcel sorting.

We recommend the vice president, Engineering Systems, in coordination with the vice president, Network Operations, direct the Small Package Sorting System program manager to:

2. Establish a process to ensure that all Small Package Sorting System sites scheduled for deployment are able to achieve optimum runtimes and processed package volumes.

We recommend the vice president, Network Operations, in support of Delivering Results, Innovation, Value, and Efficiency Initiative 43 - Building a World-Class Package Platform:

3. Establish a process to ensure that Small Package Sorting System clock rings are properly monitored to enable tracking of labor savings.

Management's Comments

Management agreed with the findings and all three recommendations, but disagreed with the other impact related to labor savings.

See Appendix B for management's comments, in their entirety.

In response to our findings, management stressed the importance of the SPSS machine for providing service and package processing in an environment of significant package growth. Management stated that the SPSS machine is capable of efficiently sorting parcels and has demonstrated that it can sort more than originally anticipated. Additionally, the Postal Service disagreed with the other impact, stating that the analysis occurred too early in the program's lifecycle to draw conclusions about its economic achievements.

In response to recommendation 1, management stated that site personnel will perform additional monitoring and analysis of performance data through the use of Run Plan Generators (RPG). Management also stated that district and area leadership will update and revise mail flows to maximize machine utilization and monitor performance through weekly teleconferences. Management plans to implement these additional activities by October 1, 2015.

In response to recommendation 2, management stated that, prior to implementation, future SPSS sites will be required to have an approved RPG that demonstrates the capability of meeting baseline performance targets. Management plans to implement this requirement by October 1, 2015.

In response to recommendation 3, management stated that they will highlight the importance of clock rings by developing additional reporting, monitoring, and operating procedures with a target implementation date of October 1, 2015.

Evaluation of Management's Comments

The OIG considers management's comments responsive to the recommendations and the actions taken or planned will address the issues identified in the report. Since the Postal Service has initiated several activities to improve machine utilization, including revised reporting and monitoring requirements, the OIG will follow-up to validate the effectiveness of these actions in future audit work of the SPSS platform.

Management disagreed with the other impact, stating that the audit occurred too early in the program's lifecycle to assess its economic impact. Since management cited the accomplishments of this machine in their justification to purchase 26 additional machines, we determined that it was necessary to evaluate whether the performance and functionality of the SPSS machine at the West Valley P&DC met stated expectations and not the SPSS program as noted by management.

Appendices

Click on the appendix title to the right to navigate to the section content.

Appendix A: Additional Information

Background

The SPSS machine is a COTS sorter for packages weighing 20 pounds or less. In March 2014, the Postal Service approved a $[redacted] million DAR to purchase and deploy five SPSS machines for evaluation purposes.[11] The DAR provided funding to evaluate new package sorting equipment for use in the fast growing and competitive package delivery market. This program is one of the major activities supporting DRIVE Initiative 43. In January 2015, the Postal Service approved $[redacted] million to purchase and deploy an additional 26 SPSS machines. This occurred before the Postal Service fully deployed the five test and evaluation machines.

According to the DAR, the SPSS machines cost less than the new APPS machines, which have been in use for almost 10 years. Additionally, SPSS machines will free up capacity on the APPS and Automated Parcel and Bundle Sorter machines that can be used to handle larger packages. The added capacity SPSS machines provide will generate labor savings in plant operations as packages move from manual to automated operations. The Postal Service projected the five SPSS machines would generate $[redacted] million in gross labor savings through FY 2025, with $[redacted] million in net operational savings and a [redacted] percent ROI.

The Postal Service identified four performance metrics to track whether SPSS machines were meeting expectations (see Table 4 for performance metrics details).

Table 4: Performance Metrics Details

Metric	Indicator	DAR Goal
SPSS Machine Operational Productivity	Total Pieces Fed (TPF) / Workhours Charged to SPSS Machine Operations	[redacted] Pieces fed per Workhour
SPSS Machine Throughput	TPF per Runtime Hour	[redacted] Pieces per Hour
SPSS Machine Acceptance Rate	Total Pieces Handled/TPF	[redacted] or Higher
Average Daily Volume Processed on SPSS Machine	TPF per day on the SPSS Machine	[redacted] Pieces per day

Source: *World-Class Package Program – Small Package Sorting System Test and Evaluation* DAR, March 17, 2014, and *26 Small Package Sorting System Machines* DAR, December 19, 2014, revised January 14, 2015.

Objective, Scope, and Methodology

Our objective was to review and evaluate whether the performance and functionality of the SPSS met stated expectations. The scope of this audit was the performance and functionality of the SPSS machine the Postal Service deployed at the West Valley P&DC. During the audit period, four other SPSS machines were deployed; however, they were not evaluated as part of this review because of limited performance data.

To achieve our objective we:

- Reviewed criteria describing the requirements for documenting a proposed investment using a DAR as well as criteria related to monitoring employee clock rings.

11 [redacted]

- Reviewed deployment schedules to evaluate deployment progress against goals established in the DAR.
- Reviewed package processing reports in WebEOR and EDW – MODS and compared the actual results with the goals of the performance metrics.
- Reviewed assumptions in the DARs supporting documentation used to develop labor savings.
- Obtained and reviewed all SPSS program expenses to ensure that the program did not go over the DAR's funded amount.
- Conducted a site visit at the West Valley P&DC from February 17-20, 2015, and:
  - Interviewed management to obtain information about the performance, functionality, and deployment of the SPSS machine.
  - Observed the SPSS machine in operation to gain an understanding about how the machine operates.
  - Determined when the site runs the machine.
  - Obtained information about all of the equipment revisions and additions made to the machine to evaluate SPSS machine functionality.
- Interviewed management at the remaining four deployed sites to obtain information about the performance, functionality, and deployment of their SPSS machine.
- Discussed performance, functionality, and deployment of SPSS machines with Engineering and Network Operations personnel, including monitoring of performance metrics at the five sites.

We conducted this performance audit from February through August 2015, in accordance with generally accepted government auditing standards and included such tests of internal controls as we considered necessary under the circumstances. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. We discussed our observations and conclusions with management on July 28, 2015, and included their comments where appropriate.

We did not asses the reliability of any computer-generated data for the purposes of this audit. We used data to assess the performance of the SPPS machine and corroborated the data with our site visit observations and interviews with Postal employees. We determined that the data used was sufficiently reliable for the purposes of this report.

Prior Audit Coverage

The U.S. Postal Service OIG did not identify any prior audits or reviews related to the objective of this audit.

Appendix B: Management's Comments

LINDA M. MALONE
VICE PRESIDENT, NETWORK OPERATIONS

UNITED STATES POSTAL SERVICE

August 18, 2015

LORI LAU DILLARD
Director, Audit Operations

SUBJECT: Small Package Sorting System Performance and Functionality at the West Valley Processing and Distribution Center
(Report Number MI-AR-15-DRAFT)

In response to your audit on the Small Package Sorting System Performance and Functionality at the West Valley Processing and Distribution Center, management wants to ensure key objectives of the program are not overlooked.

The SPSS program is designed to ensure the Postal Service has adequate capacity to address its burgeoning parcel volumes. As highlighted in the July 2014 OIG's White Paper, Package Services: Get Ready, Set, Grow!, "The Postal Service needs to invest in the package business and develop a network that maximizes the efficiency and minimizes the cost of providing modern package products and services. The existing network may not have the capabilities necessary to meet the expanding needs of today's rapidly evolving marketplace".

The SPSS program is designed around quickly implementing proven commercial off-the-shelf (COTS) technology within the package processing environment to ensure the Postal Service can provide efficient and service responsive package processing in an environment of significant growth. This program began with the installation of the first SPSS machine at the West Valley AZ P&DC in November 2014, as part of a research and development (R&D) effort to test commercially available solutions.

As noted, the SPSS machine deployed to the West Valley P&DC was the first of five R&D machines. As with nearly all R&D efforts, the lessons learned and experience gained provide valuable insight from both a technology and an operational perspective for future investment and deployments. While the OIG noted concerns related to management process in the use of the machine, the test confirmed that the machine is capable of efficiently sorting parcels. The five test sites have demonstrated they can use the equipment to sort more than the initial estimated parcels per hour. Given this audit occurred so early in the SPSS program lifecycle (evaluation period February 3 – April 30), the Postal Service believes that it is premature to draw any conclusions about the economic achievements of the SPSS program.

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Washington DC 20260-7100
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Fax: 202-268-3331
www.usps.com

In response to the specific recommendations in this audit report:

OIG Recommendations

We recommend the Vice President, Network Operations:

Recommendation 1: Establish optimum runtimes and processed package volumes for the currently deployed Small Package Sorting System site to maximize machine use and reduce manual parcel sorting.

Management Response / Action Plan: Management agrees with this recommendation and has initiated several activities to improve machine utilization at the five pilot site locations. Activities include monitoring and analyzing existing run data and establishing baseline performance targets. Site leadership has been tasked to revise Run Plan Generators (RPG) plans to ensure performance targets are met. Elevated involvement of District and Area leadership to ensure mail flows are updated and revised to maximize machine utilization is driving progress toward meeting performance expectations. Weekly telecons are conducted to monitor performance.

Target Implementation Date:
October 1, 2015

Responsible Official:
Manager, Processing Operations

We recommend the vice president, Engineering Systems, in coordination with the vice president, Network Operations, direct the Small Package Sorting System program manager to:

Recommendation 2: Establish a process to ensure that all Small Package Sorting System sites scheduled for deployment are able to achieve optimum runtimes and processed package volumes.

Management Response / Action Plan: Management agrees with this recommendation. Prior to future site implementation, sites will be required to have an approved RPG plan that demonstrates capability to meet baseline performance targets.

Target Implementation Date:
October 1, 2015

Responsible Official:
Manager, Processing Operations

We recommend the Vice President, Network Operations, in support of Delivery Results, Innovation, Value and Efficiency Initiative 43 – Building a World-Class Package Platform:

Recommendation 3: Establish a process to ensure that Small Package Sorting System clock rings are properly monitored to enable tracking of labor savings.

Management Response / Action Plan: Management agrees with this recommendation. Headquarters management will establish reporting and monitoring to track SPSS workhours. Additionally, standard operating procedures will be developed to disseminate to sites covering proper implementation of SPSS operation numbers and highlight the importance of proper clock rings to ensure compliance.

Target Implementation Date:
October 1, 2015

Responsible Official:
Manager, Processing Operations

Monetary Impact

The Postal Service believes the audit period was so early in the initial implementation phase that the monetary impact noted is not representative of full up steady state operations.

Linda M. Malone
Vice President, Network Operations

Michael J. Amato
Vice President, Engineering Systems

cc: Mr. Williams
Manager, Corporate Audit Response Management

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