OFFICE OF
INSPECTOR
GENERAL
UNITED STATES POSTAL SERVICE

Standardization of Mail Processing Equipment at Processing and Distribution Centers

Audit Report

October 4, 2011

Report Number NO-AR-12-001

OFFICE OF INSPECTOR GENERAL
UNITED STATES POSTAL SERVICE

HIGHLIGHTS

October 4, 2011

Standardization of Mail Processing Equipment at Processing and Distribution Centers

Report Number NO-AR-12-001

IMPACT ON:

Standardization of selected mail processing equipment at major U.S. Postal Service processing and distribution centers (P&DCs).

WHY THE OIG DID THE AUDIT:

We performed this self-initiated audit to assess the level of standardization of equipment at major mail processing facilities and to identify potential efficiency gains from standardizing the equipment set deployed to each facility.

WHAT THE OIG FOUND:

The Postal Service has a sufficient number of machines available to process the mail and has achieved considerable standardization of equipment at the facilities reviewed. While the Postal Service has managed to reduce workhours and has introduced initiatives to improve mail processes at the facilities, it has not always matched equipment needs to mail volume. Consequently, opportunities for further standardization exist at some facilities. Additionally, reducing the number of Delivery Bar Code Sorter Phase I machines, which sort letter mail, and redeploying newer machines could lead to further standardization and reduce maintenance costs.

WHAT THE OIG RECOMMENDED:

We recommended the vice president, Network Operations, periodically compare equipment to mail volume at P&DCs and redeploy excess equipment to those sites where equipment deficiencies exist and, when funds are available, redeploy new equipment to replace older equipment wherever it is cost effective.

WHAT MANAGEMENT SAID:

Management agreed with the recommendations, stating the Postal Service consistently reviews and analyzes the capacity of equipment and continues its effort to modernize its equipment fleet. As part of recent announcements of facility consolidation studies, management expects to dramatically reduce mail processing equipment to come in line with workload needs and purge older equipment.

AUDITORS' COMMENTS:

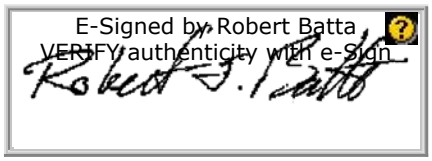
The U.S. Postal Service Office of Inspector General considers management's comments responsive to the recommendations and corrective actions should resolve the issues identified in this report.

Link to review the entire report

OFFICE OF INSPECTOR GENERAL
UNITED STATES POSTAL SERVICE

October 4, 2011

MEMORANDUM FOR: DAVID E. WILLIAMS, JR.
VICE PRESIDENT, NETWORK OPERATIONS



FROM: Robert J. Batta
Deputy Assistant Inspector General
for Mission Operations

SUBJECT: Audit Report – Standardization of Mail Processing Equipment at Processing and Distribution Centers (Report Number NO-AR-12-001)

This report presents the results of our audit of the Standardization of Mail Processing Equipment at processing and distribution centers (Project Number 11XG041NO000).

We appreciate the cooperation and courtesies provided by your staff. If you have any questions or need additional information, please contact James L. Ballard, director, Network Processing, or me at 703-248-2100.

Attachments

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Introduction

This report presents the results of our audit of the standardization[1] of mail processing equipment at processing and distribution centers (P&DCs) (Project Number 11XG041NO000). Our objectives were to assess the level of standardization of equipment at major U.S. Postal Service P&DCs and to identify potential efficiency gains from standardizing the equipment deployed to each facility. This is the first in a series of self-initiated audits on standardization and addresses operational risk. See Appendix A for additional information about this audit.

Mail processing is an integrated group of activities[2] required to sort and distribute mail for dispatch and eventual delivery. Post Offices, stations, and branches send outgoing mail to P&DCs and processing and distribution facilities for processing and dispatch for a designated service area. The Postal Service initiated Continuous Improvement or a Lean Six Sigma[3] methodology in 2008 to reduce variations or standardize processes. Standardization is defined as "all processes associated with the performance of a service, which are performed within set guidelines." This ensures the product has consistent quality.

This report will focus on standardization of the Automated Flat Sorting Machine 100 (AFSM-100) and Delivery Bar Code Sorter (DBCS) machines, which process the majority of letter and flat volumes. We sampled 22 Group 1[4] facilities whose combined total pieces fed (TPF)[5] volume was 5.7 billion.[6] The TPF volume on the AFSM-100 and DBCS machines at these facilities totaled 4.3 billion pieces (or 76 percent) of all mail handled by the P&DCs in the sample.

Conclusion

The Postal Service has a sufficient number of flat and letter machines to process the mail and has achieved considerable standardization of these machines at the facilities reviewed. Overall, the Postal Service generally matched machine deployment to mail volume, although opportunities for further standardization exist at some facilities. These opportunities exist because of the continued decline in mail volume, which has dropped by 20 percent since its peak of 213 billion pieces in FY 2006. Additionally, reducing the number of older DBCS Phase I machines and redeploying newer machines in their place could lead to increased standardization as well as reduced maintenance costs.

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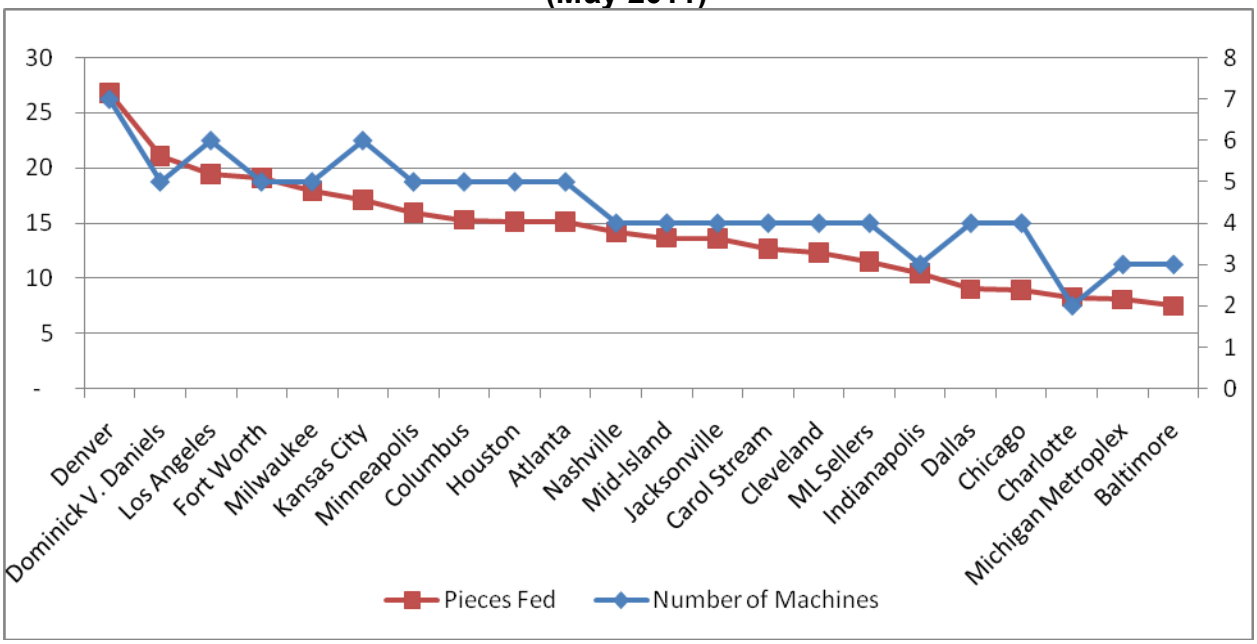
[1] The implementation of rules and specifications for common and repeated use, aimed at achieving optimum degree of order or uniformity.
[2] Mail processing activities include culling, edging, stacking, facing, canceling, sorting, tying, pouching, and bundling.
[3] Continuous Improvement is the Postal Service's plan to accomplish the business changes necessary to compete in today's marketplace and business environment. Lean management focuses on reducing waste and improving process flows, while Lean Six Sigma concentrates on reducing variation or defects and improving quality.
[4] The U.S. Postal Service Office of Inspector General (OIG) stratified facilities that process mail into seven groups ranked by mail volume outlined in the Breakthrough Productivity Initiative (BPI). Group 1 facilities process a minimum of 1.3 billion first-handling pieces (FHP) based on fiscal year (FY) 2010 mail volume.
[5] The number of pieces inducted at the front of mechanization for automation equipment. This includes rejects, reworks, and re-feeds.
[6] Mail volume processed during the period of May 1–31, 2011. December mail volume processed December 1-31, 2010, was 6.7 billion during the peak mailing season.

Machine Deployment Matched to Mail Volume

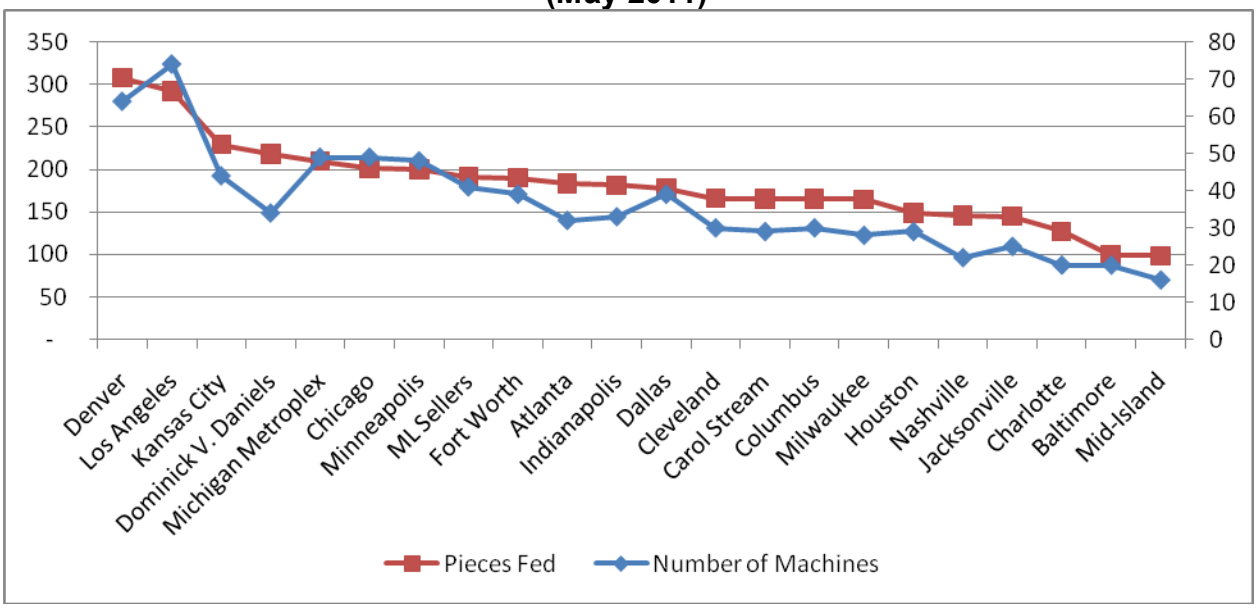
We found considerable standardization among AFSM-100 and DBCS machine deployment when comparing the number of machines in the facilities to mail volume. The correlation[7] between the number of AFSM-100 machines deployed and associated mail volume processed in these machines is 89 percent. The correlation between the number of DBCS machines and the mail volume processed in these machines is 93 percent. Such a high positive correlation indicates that management has been successful in standardizing the equipment. See Charts 1 and 2.

Chart 1 – Number of AFSM-100 Machines and Pieces Fed (Millions) (May 2011)



[7] Correlation is a measure of the relation between two or more variables. Correlation coefficients can range from -1.00 to +1.00. The value of -1.00 represents a perfect negative correlation, while a value of +1.00 represents a perfect positive correlation. A value of 0.00 represents a lack of correlation.

Chart 2 – Number of DBCS Machines and Pieces Fed (Millions) (May 2011)



Further, analysis found the majority of equipment performed at comparable efficiency levels. Specifically, when reviewing AFSM-100 machines, we found that their throughput rates at 11 of the 22 facilities sampled fell within 10 percent of the average group throughput[8] rate of 14,485 mailpieces per hour. Our analysis of the DBCS machines found that 100 percent of the facilities sampled in Group 1 fell within 10 percent of the average throughput rate of 35,912 mailpieces per hour. When all sites in the sample fall within 10 percent of the average throughput, it indicates the machines are operating at comparable efficiency levels and that standardization exists. See Charts 3 and 4.

[8] Throughput is the rate at which a machine processes mail usually designated in pieces per hour.

Chart 3 – AFSM-100 Machine Throughput (Thousands) (May 2011)

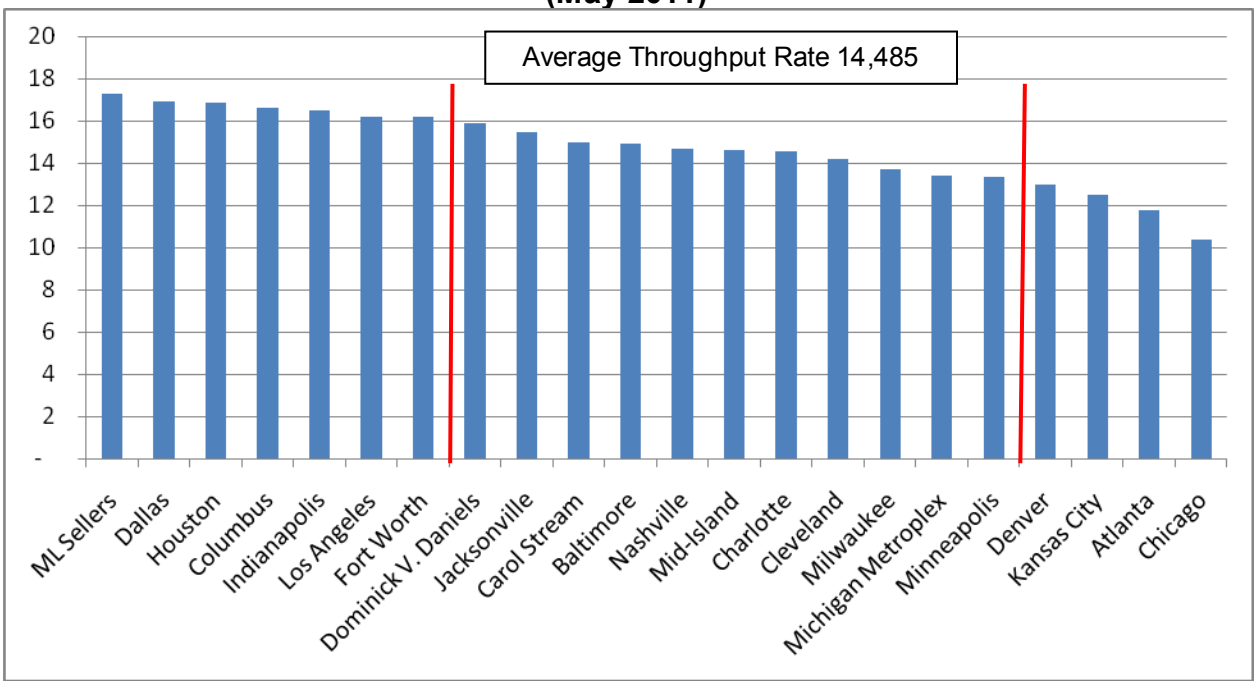
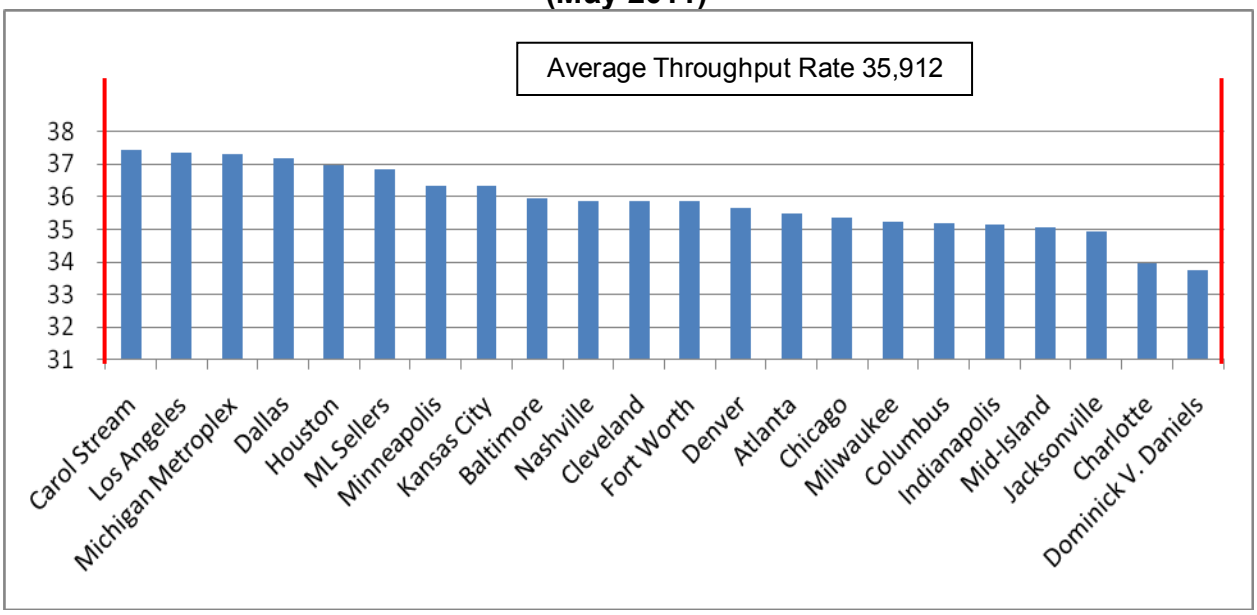


Chart 4 – DBCS Machine Throughput (Thousands) (May 2011)



Opportunities for Further Standardization

We identified opportunities for further standardization by identifying those facilities whose equipment set did not match mail volumes being processed at that facility. Of the 22 facilities, we found opportunities for further standardization for AFSM-100 machines in nine and for DBCS machines in eight[9] (see Table 1).

For example, our analysis, which compares throughput to the number of machines in the plants, indicates the Los Angeles P&DC and others had more machines than actually needed to process letter volumes (see Chart 2), which shows the facilities as outliers in the correlation analysis. Conversely, our analysis of AFSM-100 machines shows the Dominick V. Daniels P&DC may not have enough machines to process all flat volumes effectively, supported by the correlation analysis in Chart 1 showing that facility as a significant outlier.

Table 1 summarizes our analysis of AFSM-100 machine and DBCS machine deployment and variance between the number of machines needed and the machines on hand.

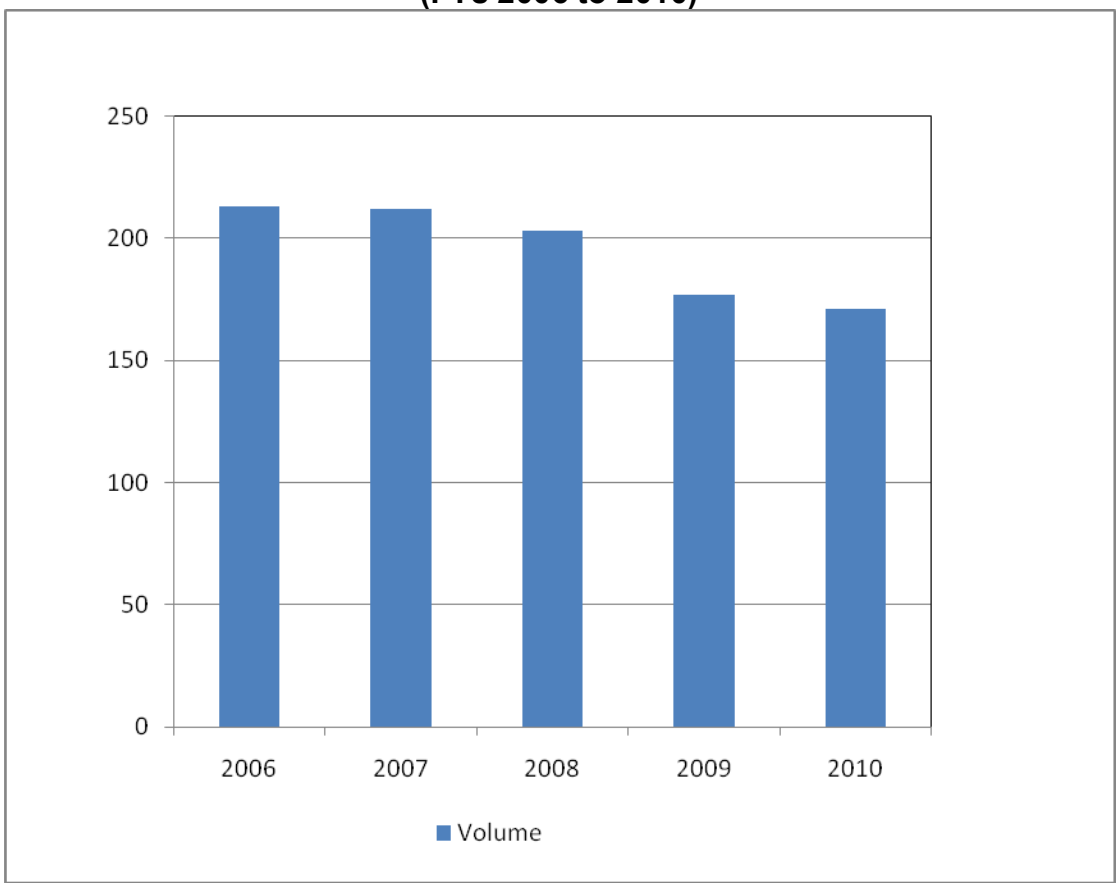
[9] When considering the number of facilities that may not be standardized, we counted those that need to adjust the number of DBCS by five or more. However, we recognize that the Postal Service requires sufficient capacity to handle peak day mail processing volumes and, in some locations, there may be other factors that impact the number of machines needed to meet mail processing goals. These factors may include the number of delivery points serviced, service standards, machine configuration, and the level of overnight exchanges between plants.

Table 1 – Group 1 AFSM-100 Machine and DBCS Machine Breakdown (May 2011)

P&DCs	Actual Number of Machines		Number of AFSM-100 Machines Needed and Variance		Number of DBCS Machines Needed and Variance	
	AFSM	DBCS	AFSM	Under/(Over)	DBCS	Under/(Over)
Atlanta	5	32	5	0	36	4
Baltimore	3	20	2	(1)	20	0
Carol Stream	4	29	4	0	33	4
Charlotte	2	20	3	1	25	5
Chicago	4	49	3	(1)	40	(9)
Nashville	4	22	4	0	29	7
Cleveland	4	30	4	0	33	3
Columbus	5	30	5	0	33	3
Dallas	4	39	3	(1)	35	(4)
Denver	7	64	8	1	61	(3)
Dominick V. Daniels	5	34	7	2	43	9
Fort Worth	5	39	6	1	38	(1)
Houston	5	29	5	0	29	0
Indianapolis	3	33	3	0	36	3
Jacksonville	4	25	4	0	29	4
Kansas City	6	44	5	(1)	45	1
Los Angeles	6	74	6	0	58	(16)
Michigan Metroplex	3	49	3	0	42	(7)
Mid-Island	4	16	4	0	20	4
Milwaukee	5	28	6	1	33	5
Minneapolis	5	48	5	0	40	(8)
ML Sellers	4	41	4	0	38	(3)

These opportunities exist because the Postal Service was not able to adjust to the unprecedented decline in mail volume, which has dropped from 213 billion pieces in FY 2006 to 171 billion pieces in FY 2010, a decline of 20 percent (see Chart 5). While the Postal Service has managed to reduce workhours by 27 percent since FY 2000 and introduced initiatives to improve the mail processes in the facilities, it has not always matched equipment needs to mail volume.

Chart 5 – Mail Volume (Billions)
(FYs 2006 to 2010)



Source: Postal Service Form 10-K Report

DBCS Phase Upgrades

There are seven phases of DBCS machines deployed nationwide. The Postal Service introduced the DBCS Phase I machine in 1991, subsequently adding newer models with Phases II through VII. We found selected Group 1 facilities also deployed all phases of the DBCS machines (see Table 2).

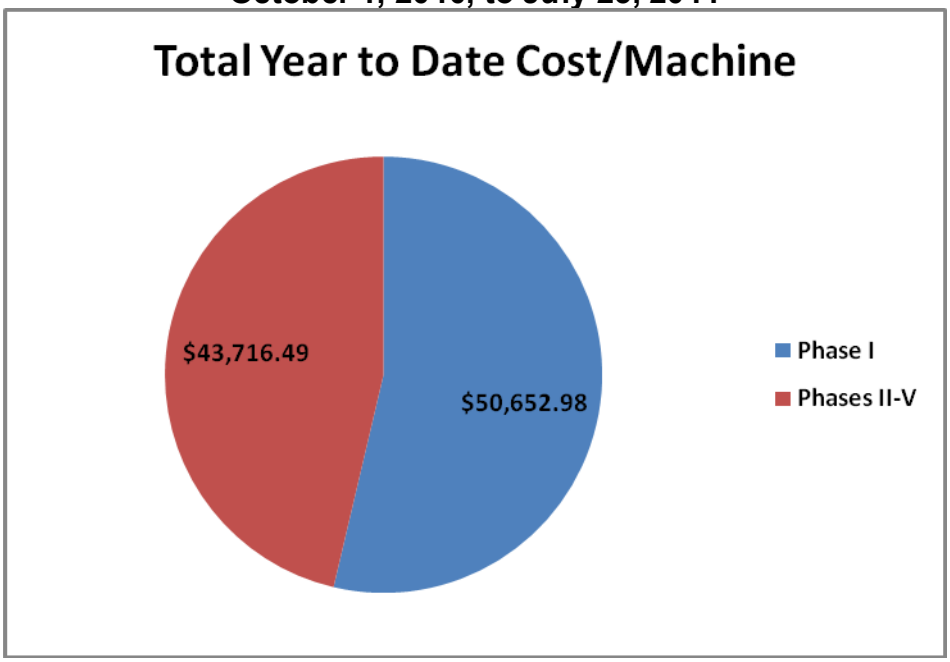
Table 2 – Group 1 DBCS Machine Deployment (May 2011)

DBCS Machine Deployment			
P&DCs	**Phase I**	**Phases II-V**	**Phases VI-VII**
Minneapolis	16	29	3
Carol Stream	15	13	1
Dallas	11	26	2
Denver	10	48	6
Mid-Island	9	7	0
Fort Worth	8	31	0
Cleveland	7	23	0
Charlotte	2	17	1
Chicago	2	25	22
Nashville	2	16	3
Atlanta	1	30	1
Baltimore	0	20	0
Columbus	0	27	3
Dominick V. Daniels	0	33	1
Houston	0	27	2
Indianapolis	0	28	5
Jacksonville	0	21	4
Kansas City	0	40	4
Los Angeles	0	70	3
Michigan Metroplex	0	49	0
Milwaukee	0	26	2
ML Sellers	0	39	2
TOTAL	**83**	**645**	**65**

The average maintenance cost[10] is approximately $51,000 for the Phase I machines and $44,000 for Phase II through V machines,[11] a difference of about $7,000 annually per machine. Reducing the number of DBCS Phase I machines and redeploying Phase II or above as indicated could lead to additional standardization and reduced maintenance costs (see Chart 6).

[10] Costs per machine that include corrective maintenance, reactive maintenance, preventative maintenance, material costs, and operational maintenance.
[11] These costs are for FY 2011, year-to-date, and are limited to Phase I, Model AC and Phase II through V, Model CJ deployed nationwide.

Chart 6 – Average Annual DBCS Maintenance Cost Per Machine[12] October 1, 2010, to July 25, 2011



Recommendations

We recommend the vice president, Network Operations:

1. Periodically compare equipment to mail volume at processing and distribution centers and redeploy excess mail processing equipment to those sites where equipment deficiencies exist.

2. As funds are available, redeploy newer mail processing equipment to replace older equipment whenever it is cost effective.

Management's Comments

Management agreed with recommendation 1, stating the Postal Service consistently reviews and analyzes the capacity of its equipment and has removed over 1,500 pieces of equipment over the past 3 years and continues to identify areas for improvement. As part of recent announcements of facility consolidation studies, the Postal Service expects to reduce its mail processing equipment to be in line with workload needs.

Management agreed with recommendation 2, stating the Postal Service continues with its efforts to modernize its equipment fleet, responsibly balancing the capital constraints of the organization with the efficiencies that it could gain through state-of-the-art

[12] We calculated the average maintenance cost per machine by dividing total maintenance costs by the number of machines deployed from October 1, 2010, to July 25, 2011.

equipment investments. As a part of its recent announcements of facility consolidation studies, the Postal Service will be able to reduce its older equipment. See Appendix B for management's comments in their entirety.

Evaluation of Management's Comments

The OIG considers management's comments responsive to the recommendations in the report and corrective actions should resolve the issues identified in the report.

Appendix A: Additional Information

Background

The Postal Service is facing one of the most difficult challenges in its history. There has been a continual decline in First-Class Mail® volume over the past decade. The recent recession, continuing economic pressures, the use of electronic media, and additional expenses associated with Retirement Health Benefit pre-funding have had a significant adverse impact on operating expenses and mail volume. Net losses for the 9 months ended June 30 amount to $5.7 billion in 2011 compared to $5.4 billion in 2010.

In testimony before Congress,[13] the U.S. Government Accountability Office (GAO) stated that action is urgently needed to facilitate the Postal Service's financial viability, as it cannot support its current level of service and operations. The Postal Service needs to become a leaner, more flexible organization so that it can operate more efficiently, control costs, keep rates affordable, and meet customers' changing needs. The Postal Service needs to realign its operations, networks, and workforce need to meet changes in mail usage and customer behavior, as the Postal Service now has costly excess capacity.

The Postal Service introduced Continuous Improvement in 2008 to make the business changes necessary to compete in today's marketplace and business environment. The Postal Service uses the Origin-Destination Information System-Revenue, Pieces, and Weight system, a probability sampling system, to assist in estimating the Postal Service's revenue, volume flow, weight, and performance measurement. Management uses the information gathered to estimate the volume of mail by category and class, which aids the Postal Service in rate setting. Additionally, management uses this information to plan for transportation and mail processing operations and to design and develop mail processing facilities and equipment requirements.

Our analysis of equipment standardization focused on two machines, the AFSM-100 and the DBCS machine. The AFSM-100 machine is fully automated and processes flat size[14] mail. The machine receives mail via automatic feeders, acquires images of script and typed mail for video encoding, and processes mail using optical character recognition technology (see Photograph 1).

[13] GAO testimony before the Subcommittee on Federal Workforce, U.S. Postal Service and Labor Policy, Committee on Oversight and Government Reform, House of Representatives (Testimony Number GAO-11-428T, dated March 2, 2011).

[14] A mailpiece that exceeds one of the dimensions for letter-size mail (11-1/2 inches long, 6-1/8 inches high, 1/4 inch thick) but that does not exceed the maximum dimension for the mail processing category (15 inches long, 12 inches high, 3/4 inch thick).

Photograph 1 – AFSM-100 Machine

Source: Postal Service Blue Pages

The DBCS machine is an automated letter sorting machine used for letter-size mail already barcoded either by mailers or by the Postal Service on other equipment. The high-speed multilevel DBCS machine can sort mail in carrier walk sequence, eliminating additional sorting at the delivery unit. The DBCS can also sort letter mail to carriers in sector-segment sequence using a two-pass operation. Sector-segment sorting places the mail in block face delivery sequence (see Photograph 2).

Photograph 2 – DBCS Machine

Source: Postal Service Blue Pages

Objectives, Scope, and Methodology

Our objectives were to assess the level of standardization of equipment at major Postal Service P&DCs and to identify potential efficiency gains from standardizing the equipment set deployed to each facility.

We used computer-processed data from the Web End of Run (WebEOR) system. We pulled data from May 1 through 31, 2011, but did not test controls over these systems. However, we checked the reasonableness of results by confirming our analysis and results with management and multiple data sources.

To accomplish our objectives, we obtained the listing for the seven plant groups as stratified by the OIG.[15] We judgmentally selected a sample of 50 percent of the facilities from Group 1 as our sample. We selected our sample from Group 1 facilities because they are the largest facilities and typically have more equipment than those facilities in the other groups. We obtained the Machine Summary and the Machine Mapping reports from WebEOR to determine equipment inventory, volume, and the DBCS machine phases for our sample. We analyzed the inventory for each plant in the sample to assess the level of standardization of equipment. We also analyzed the data to identify potential efficiency gains from standardizing the equipment.

We conducted this performance audit from June through October 2011, 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 objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. We discussed our findings and conclusions with management on September 8, 2011, and included their comments where appropriate.

Title 39, U.S.C., Part 1, Chapter 4, § 403, states: “The Postal Service shall plan, develop, promote, and provide adequate and efficient postal services at fair and reasonable rates and fees.” It further states that; "It shall be the responsibility of the Postal Service to maintain an efficient system of collection, sorting, and delivery of the mail nationwide." Further, the Postal Accountability and Enhancement Act, P.L. 109-435, December 20, 2006, Title II, highlights ". . . the need for the Postal Service to increase its efficiency and reduce its costs, including infrastructure costs, to help maintain high quality, affordable postal services. . .” and Title 39, U.S.C., Part 1, Chapter 1, § 101, states that the Postal Service: ". . . shall provide prompt, reliable, and

[15] We divided facilities that process mail into seven groups ranked by mail volume outlined in the BPI. The Postal Service established the BPI to drive costs out of the organization while creating continuous improvement capability. The BPI uses comparative monitoring and performance ranking in operating units across the country. Higher performing units are sometimes used as models to identify best practices. Standard procedures are based on best practices and training is developed to share performance expectations. Targets are set to drive performance toward the highest levels.

efficient services to patrons in all areas and shall render postal services to all communities."

Prior Audit Coverage

The OIG did not identify any prior audits or reviews related to the objectives of this audit.

Appendix B: Management's Comments

DAVID E. WILLIAMS
VICE PRESIDENT, NETWORK OPERATIONS

UNITED STATES POSTAL SERVICE

September 28, 2011

SHIRIAN B. HOLLAND
ACTING DIRECTOR, AUDIT OPERATIONS

SUBJECT: Standardization of Mail Processing Equipment at Processing and Distribution Centers (Report Number NO-AR-11)

Thank you for the opportunity to respond to the recommendations contained in the Draft Audit Report – Standardization of Mail Processing Equipment at Processing and Distribution Centers. Management agrees with all recommendations.

Recommendation 1:
Periodically compare equipment to mail volumes at processing and distribution centers, redeploying excess mail processing equipment to those sites where equipment deficiencies exist.

Management Response/Action Plan:
Management agrees with this recommendation. The Postal Service consistently reviews and analyzes the capacity of its equipment. Over the past three years, the Postal Service has removed over 1,500 pieces of equipment and continues to identify areas of improvement. As part of its recent announcements of facility consolidation studies, the Postal Service expects to dramatically reduce its mail processing equipment in line with the workload needs.

Target Implementation Date:
December 2011

Responsible Official:
Manager, Processing Operations / Manager, Network Development and Support

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Recommendation 2:
As funds are available, redeploy newer mail processing equipment to replace older equipment whenever it is cost effective.

Management Response/Action Plan:
Management agrees with this recommendation. The Postal Service continues with its efforts to modernize its equipment fleet in a responsible manner which balances the capital constraints of the organization with the efficiencies which can be gained through state of the art equipment investments. Currently the Postal Service is replacing its Advanced Facer-Canceller System (AFCS) technology with the new AFCS 200 to take advantage of the efficiency gains, as well as the update of its end of life Small Parcel and Bundle Sorter with a reengineering to the state of the art Automated Parcel and Bundle Sorter. As part of its recent announcements of facility consolidation studies, the Postal Service will be able to reduce its older equipment.

Target Implementation Date:
December 2011

Responsible Official:
Manager, Processing Operations / Manager, Network Development and Support

This report and management's response do not contain information that may be exempt from disclosure under the FOIA.

David E. Williams

cc: Mr. Aliperto
Mr. Black
Ms. Feindt
Mr. Fields
Mr. Small
Ms. Welch
Mr. Neri
Mr. Grossmann
Mr. Batta
Ms. Haring
Corporate Audit and Response Management