



May 07, 2010

JERRY D. LANE  
VICE PRESIDENT, CAPITAL METRO OPERATIONS

SUBJECT: Audit Report – Capital Metro Area: Delivery Barcode Sorters Equipment Utilization (Report Number DA-AR-10-002)

This report presents the results of our self-initiated audit of equipment utilization. (Project Number 09YG039DA000). As we highlighted in the Quarter 1 fiscal year (FY) 2010 maintenance risk model, delivery barcode sorter (DBCS) machines — core letter mail processing platforms — were experiencing a 50 percent utilization rate. To maximize the utilization of DBCS equipment to meet cost goals and minimize financial risk, our objective was to identify solutions for DBCS machine excess capacity, given declining mail volume. See [Appendix A](#) for additional information about this audit.

### Conclusion

Declining mail volumes have resulted in decreased utilization of DBCS machines in the Capital Metro Area. While mail volumes decline, plants routinely staff and operate DBCS machines unnecessarily using traditional standard approaches. DBCS excess capacities exist because plants in the Capital Metro Area do not adhere to lean six sigma work distribution standards. To minimize overcapacity, lean six sigma synchronizes DBCS startups with available mail volume and dispatch times. We determined that the Capital Metro Area could have deactivated 55 and 72 DBCS machines<sup>1</sup> during FYs 2008 and 2009, respectively, and still meet service requirements. Deactivating excess DBCS machines would have saved the Capital Metro Area \$3.1 million in mail processing costs and \$6.6 million in maintenance costs during FYs 2008 and 2009. See [Appendix B](#) for our detailed analysis of this topic.

To address DBCS excess capacity, we recommend the vice president, Capital Metro Area:

1. Incorporate lean six sigma work distribution standards for DBCS mail processing.
2. As DBCS machines become idle, deactivate and eliminate the associated mail processing and maintenance workhours.

---

<sup>1</sup> Full-time equivalents based on 303 days per year.

## Management's Comments

Management agreed with our finding and two recommendations and is taking the following actions to implement corrective measures:

- Recommendation 1 – Management stated it is presently undertaking a lean six sigma initiative to improve DBCS utilization and expects to complete the initiative by June 30, 2010.
- Recommendation 2 – Management, in recognition of declining mail volume, plans to properly schedule machines to match the declining workload.

Management does not agree with the annual impact of our findings on maintenance and mail processing workhours and provided the following reasons:

- They had difficulty assessing calculations because the specific calculation used in the report and considerations taken into account as stated in the report were not in the draft report.
- The OIG may not have taken all factors into consideration, leading to inflated dollar savings.
- The discussion draft indicated 27 excess DBCS machines and the draft report noted 72.
- The Capital Metro Area would require the 30 existing underutilized DBCSs to satisfy its ongoing initiative to eliminate all Carrier Sequence Bar Code Sorters (CSBCS) processing.

We have included management comments, in their entirety, in [Appendix D](#).

## Evaluation of Management's Comments

While management agrees with the recommendations and the existence of a monetary impact, they believe the amount is inflated. Our analysis appropriately considered customer service times and any CSBCS machines eliminated during FYs 2008 and 2009. We believe the reported monetary impact is conservative. It is based on maintenance and mail processing hours that could have been saved if fewer DBCS machines had been in operation during the last two fiscal years. We did not project the future impact of eliminating DBCS machines.

Although our calculations showed 72 DBCS machine could have been deactivated based on FY 2009 mail volumes, we did not recommend deactivation of a specific number of machines in consideration of the CSBCS reduction initiative. Management's final analysis concluded the Postal Service would need 30 DBCS machines to process CSBCS mail moved from the field to the P&DC's. Therefore, based on the Capital Metro Area analysis and our analysis, we believe the opportunity exists to deactivate 42

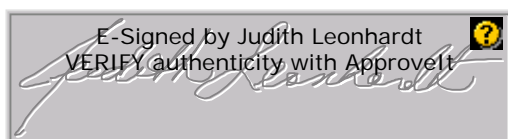
DBCS machines<sup>2</sup>. We believe the monetary impact presented is conservative as if we had calculated the monetary impact of future DBCS machine reductions due to declining mail volumes, the monetary impact would have been significantly higher over a 10-year period.

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

The OIG considers all recommendations significant, and therefore requires OIG concurrence before closure. Consequently, the OIG requests written confirmation when corrective actions are completed. These recommendations should not be closed in the Postal Service's follow-up tracking system until the OIG provides written confirmation that the recommendations can be closed.

We will report \$9,639,036 in unrecoverable questioned costs in our *Semiannual Report to Congress*.

We appreciate the cooperation and courtesies provided by your staff. If you have any questions or need additional information, please contact Miguel Castillo, director, Engineering and Facilities, or me at 703-248-2100.



**for**

Mark Duda  
Deputy Assistant Inspector General  
for Support Operations

Attachments

cc: Patrick Donahoe  
Steven J. Forte  
David E. Williams  
Area Vice Presidents  
Sally K. Haring

---

<sup>2</sup> Based on FY09 volumes, 72 DBCS machine could be eliminated. Subtracting the 30 DBCS machines needed to process future CSBCS volumes allows for the elimination of 42 DBCS machines.

## **APPENDIX A: ADDITIONAL INFORMATION**

### **BACKGROUND**

The DBCS is a multilevel, high speed bar code sorter. Implementation of the delivery point bar code allows the DBCS to sort letter mail in carrier walk sequence, eliminating the need for additional sorting at the delivery unit. Letter trays of sequenced mail are transported by the carrier directly to vehicles for delivery to the customer. Because the DBCS can sort approximately 40,000 pieces per hour, it has become a major contributor to rapid and efficient letter mail processing. To maximize the utilization of DBCS equipment to meet the service standard and cost goals the mail and machine must be readied before processing. Once ready, no more than two clerks are assigned to operate the machine.

Preventive maintenance is the scheduled, systematic servicing of equipment to maximize operating conditions. Preventive maintenance guidelines<sup>3</sup> are based on pieces fed per production run for the DBCS machines. Because the level of mail processing activity wears parts, preventive maintenance performed is based on the daily throughput of the machine.

Lean management is focused on reducing waste and improving process flows while Six Sigma methodologies concentrate on reducing variation or defects and improving quality. Of the 218 DBCS Lean Six Sigma projects tracked by Postal Service, one project was in process that addressed automation utilization.

### **OBJECTIVE, SCOPE, AND METHODOLOGY**

Our audit objective was to identify solutions for DBCS machine excess capacity, given declining mail volume. To answer our objective, we visited and interviewed managers at nine of 28 plants that process more than 40 percent of letter mail in the Capital Metro Area. These plants were judgmentally selected based on high letter mail volume. We also analyzed Web End of Run (WebEOR)<sup>4</sup> data to assess DBCS processing capacity. To determine monetary impact, we identified the additional operational and maintenance costs attributed to distributing workloads over available DBCS machines.

We extracted data from the WebEOR system to analyze DBCS utilization. The OIG previously reported<sup>5</sup> that the internal controls over management operating data (MODS) were generally effective and reliable when used for the purpose for which it is intended – to assess overall plant efficiency. We also performed reasonableness tests and found the WebEOR volume data sufficiently reliable to satisfy our audit objective.

---

<sup>3</sup> MMO-082-07, Production Based Maintenance

<sup>4</sup> WebEOR provides the capability to reproduce and summarize machine information captured during a DBCS run.

<sup>5</sup> *Management Operating Data System* (Report Number MS-AR-07-003, dated August 21, 2007). WebEOR is a feeder system to MODS.

We conducted this performance audit from August 2009 through April 2010 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 March 10, 2010, and included their comments where appropriate.

## **PRIOR AUDIT COVERAGE**

We did not identify any prior audits or reviews related to the objective of this audit.

## APPENDIX B: DETAILED ANALYSIS

### Excess Delivery Barcode Sorter Capacity

Although Capital Metro Area letter mail volume declined from 30.7 to 25.9 billion pieces (15.6 percent) from FY 2007 through FY 2009, plants continue to operate and staff available DBCSs in the same manner. As shown in Chart 1, FY 2009 Capital Metro Area DBCS excess capacity ranged from 50 to 57 percent by District. This overcapacity could process another 21.5 billion letter mailpieces. The greatest opportunities to minimize excess capacities were in the Baltimore, Richmond, and Greensboro districts, accounting for more than 60 percent of the excess mailpiece capacity.

**Chart 1. FY 2009 Capital Metro Area Delivery Barcode Sorter Excess Capacity**

District	Machine Under-Utilization Percentage	Excess Mailpiece Capacity (000s)	Cumulative Percent
Baltimore	57%	5,148,855	24%
Richmond	53%	4,126,524	19%
Greensboro	51%	3,883,170	18%
Northern Virginia	54%	3,032,021	14%
Mid-Carolinas	50%	2,908,327	13%
Greater South Carolina	50%	2,012,589	9%
Capital	56%	434,159	2%
<b>Total</b>	<b>--</b>	<b>21,545,645</b>	<b>100%</b>

**Source: Enterprise Data Warehouse and Mail Image Reporting System, FY 2009.**

We recognize that the Capital Metro Area has an ongoing initiative to reduce carrier sequence barcode sorters (CSBCS) letter mail processing at delivery units. If all delivery units respond to the Capital Metro Area's initiative<sup>6</sup> to reduce CSBCS mail processing, delivery point sequencing (DPS) volume at plants would increase proportionately. We have previously reported<sup>7</sup> that although a business case exists for continued use of CSBCS machines in some associate offices, districts can still reduce machines. For example, the Mid Carolinas district reduced 11 of 121 CSBCS machines but had not yet fully evaluated moving more letter mail to the DBCS' in the plants. Should DBCS excess capacity still exist after this initiative, the Capital Metro Area would be in a position to strategically determine which DBCS machines it can deactivate and still meet delivery service requirements. Reducing excess machine capacities has the potential to save additional processing and maintenance workhours as described in the next sections.

<sup>6</sup> Headquarters Operations Technical and Systems Integration Support personnel began an initiative during FY 2009 to reduce the number of CSBCS machines nationwide because of declining mail volumes.

<sup>7</sup> Continuing Use of Carrier Sequence Barcode Sorter Machines at Delivery Units (Report Number DR-AR-10-004)

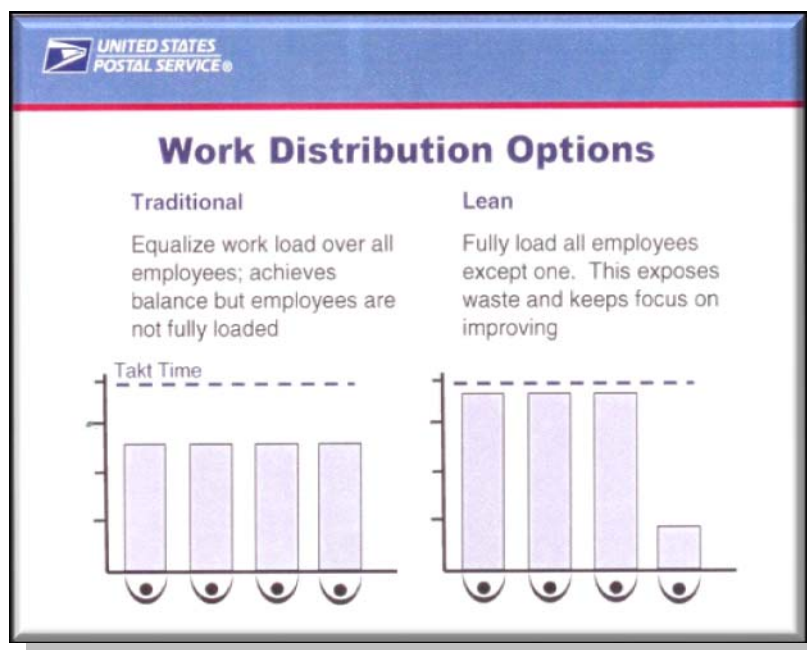
## Delivery Barcode Sorter and Lean Six Sigma Management Standards

Illustration 1. Traditional Versus Lean

Delivery Barcode Sorter and lean six sigma management standards<sup>8</sup> recommend using mail volume levels when determining the number of machines to operate and staff. The procedures outlined in these standards are key to reducing excess capacities or overproduction,<sup>9</sup> increasing productivity, and controlling costs.

DBCS excess capacities existed because plants<sup>10</sup> in the Capital Metro Area did not adhere to lean six sigma work distribution standards. In addition, although the DBCS

work instruction guide requires consideration of mail volume before machine startup, it does not reference lean sigma principles regarding overproduction. Illustration 1 depicts work distribution options, highlighting the lean option to fully load machines, except one to expose waste. To minimize overproduction, lean six sigma synchronizes DBCS startups with available mail volume and dispatch times.



<sup>8</sup> *DBCS Standardization Work Instruction Guide*, Version 9, dated May 31, 2006  
<http://blue.usps.gov/continuousimprovement/presentations.htm>

<sup>9</sup> Overproduction - making more than is required by the next process; making it earlier than is required by the next process; making it faster than is required by the next process.

<sup>10</sup> We conducted site visits at the following Capital Metro plants; Merrifield Processing and Distribution Center (P&DC), Dulles P&DC, Richmond P&DC, Charlotte P&DC, Ashville P&DC, Greenville P&DC, Hickory P&DF, Suburban MD P&DC, and Columbia P&DC. In addition, we performed data analysis of average daily machine runtimes for all plants in the Capital Metro Area.

### Impact of Excess Delivery Barcode Sorter Capacity

Fully loading and staffing needed DBCS machines before starting the next machine can reduce work crew and maintenance needs. Combining any two DBCS DPS second pass sorts less than 1.5 hours on one machine permits deactivation of the other machine while allowing time for clearance. Using this criteria, we determined that the Capital Metro Area could have deactivated 55 and 72 DBCS machine equivalents<sup>11</sup> during FYs 2008 and 2009, respectively, and still have met service requirements.

We estimate deactivating excess DBCS machines would have saved the Capital Metro Area \$3.1 million in mail processing costs and \$6.6 million in maintenance costs during FYs 2008 and 2009. This action should also result in savings in future years as the Capital Metro Area implements its CSBCS initiative and idle DBCS machines become more apparent. See [Appendix C](#) for details of the monetary impact calculations.

---

<sup>11</sup> For FY 2008, 16,663 machine-days/303 days per year and for FY 2009, 21,873 machine-days/303 days per year.



### APPENDIX C: MONETARY IMPACT CALCULATIONS

Maintenance and Mail Processing Costs				
Unrecoverable Questioned Cost				
		Hours	Cost	Total Cost
Maintenance	FY 2008	73,317	\$2,755,994	
	FY 2009	96,241	\$3,798,640	\$6,554,634
Mail Processing	FY 2008	39,595	\$1,330,396	
	FY 2009	49,548	\$1,754,006	\$3,084,402
Total Monetary Impact				\$9,639,036

The preceding calculation of monetary impact is based on specific facts derived from data. These facts are as follows:

- FY 2008 Capital Metro Area Overtime Hourly labor rates, Labor Distribution Code (LDC) 36 = \$37.59, LDC 11 = \$33.60,
- FY 2009 Capital Metro Area Overtime Hourly labor rates, Labor Distribution Code (LDC) 36 = \$39.47, LDC 11 = \$35.44,
- LDC 11 hour savings = Actual hours x percent runtime for machines that could have been deactivated.
- LDC 36 hour savings = average preventive and corrective maintenance hours per machine per day x total days machines recommended for deactivation were run.
- FYs 2008 and 2009 mail processing (LDC 11) and maintenance (LDC 36) overtime dollars are \$20.8 million and \$11.9 million, respectively.

## APPENDIX D: MANAGEMENT'S COMMENTS

VICE PRESIDENT  
CAPITAL METRO AREA OPERATIONS



April 28, 2010

LUCINE M WILLIS  
DIRECTOR, AUDIT OPERATIONS  
OFFICE OF INSPECTOR GENERAL

SUBJECT: Transmittal of Draft Report – Capital Metro Area: Delivery Barcode Sorter Equipment Utilization (Report Number DA-AR-10-DRAFT)

The Capital Metro Area has reviewed the subject Draft Audit Report – Delivery Barcode Sorter Equipment Utilization – Capital Metro (Report Number DA-AR-10-DRAFT), and concurs with the general findings and recommendations of the OIG audit team. We agree in principle that a monetary impact exists and commit to capturing potential savings through implemented efficiencies. Additionally, this report and management's response do not contain information that may be exempt from disclosure under the FOIA (Freedom of Information Act).

**Recommendation #1:** Incorporate lean six sigma work distribution standards for DBCS mail processing.

**Response #1:** Capital Metro Area agrees with the recommendation of incorporating Lean Six Sigma (LSS) work distribution standards for DBCS mail processing. Capital Metro currently has undertaken our own LDC 11 LSS initiative to improve DBCS efficiency and utilization in all plants. This initiative is expected to be completed by June 30, 2010.

**Recommendation #2:** As DBCS machines become idle, deactivate and eliminate the associated mail processing and maintenance work hours.

**Response #2:** We agree that as DBCS machines become idle, the associated mail processing work hours should be eliminated. We also recognize that our plants have underutilized DBCS equipment due to declining mail volume, and opportunity to capture the associated savings through proper scheduling of the machines to match the declining workload. However, we do not agree with the assessment that the equivalent of 72 DBCSs can be deactivated without a serious degradation in service.

As no specifics have been provided as to the calculations used and considerations taken into account in determining that 72 DBCSs can be deactivated, it is difficult to effectively assess your analysis and calculations. However, based on the total number of machines which have been suggested for deactivation, it appears that planned mail arrival times, required DPS clearance times and many other factors may not have been taken into consideration. As an example, many of our plants have limited Tour 1 DPS operational windows due to programmed overnight committed arrival times as late as 0300 (a time which no DPS First pass runs can end prior to in the respective plant) and required DPS Second Pass Clearance Times (CTs) as early as 0400 (driven by transportation travel times to delivery units). In addition, the resulting built-in excess DBCS capacity on Tour 3 driven by the number of DBCSs required on Tour 1 to support DPS may also not have been taken into consideration. As these recommendations were used for the monetary impact calculations, we also believe that the dollar savings calculations are inflated.

MAILING ADDRESS  
16501 SHADY GROVE ROAD  
GAITHERSBURG, MD 20898-9998  
301 548-1410  
FAX: 301 548-1434

It should be noted that the discussion draft provided to the Area for review in late February 2010 included a chart indicating the number of excess DBCSs by district totaled 27 machines for the CM Area. The 72 excess machines noted in this draft is approximately three times the 27 suggested in the discussion draft.

Capital Metro's ongoing initiative to improve DBCS utilization and eliminate CSBCS processing, discussed with you in our November 23 entrance meeting, eliminated 65 CSBCSs on December 15 in the Richmond District. Completion of the Area's analysis and plan for improved DBCS utilization indicates that 30 existing underutilized DBCSs will be required to eliminate all CSBCSs throughout the Area. These machines will be relocated from plants with underutilized equipment, absorbed within existing Capital Metro plants with CSBCSs within their processing area and, if necessary, from outside the Area. This plan is being carefully coordinated, taking into account existing AMP implementation plans, the new facility activation in Greenville, SC, and to reduce any possibility of negative service impacts.

Capital Metro will continue the efforts to review the utilization and efficiencies of all mail processing equipment in each plant throughout the Area and look for additional opportunities for work hour savings related to improved utilization of our DBCS equipment. However, based on your analysis provided, we do not agree with your assessment that 72 DBCSs can be deactivated, and ask that you provide the specific rationale and calculations used in your analysis.

If you require additional information, you may contact Ron Worrich, Area Manager In-Plant Support or Jeff Becker, Area Manager Operations Support.

  
Jerry B. Lane

cc: Sally K. Haring, [CARMMManager@USPS.GOV](mailto:CARMMManager@USPS.GOV)  
Steve Darragh  
Kit Allshouse