September 30, 2003

THOMAS G. DAY
VICE PRESIDENT, ENGINEERING

SUBJECT: Audit Report - Delivery Bar Code Sorter – Expanded Capability
                     (Report Number DA-AR-03-007)

This report presents the results of our self-initiated review of the Delivery Bar Code
Sorter – Expanded Capability (Project Number 02BG025DA000). During the survey, we
identified concerns in the areas of testing and machine utilization, which if left
unresolved could negatively impact performance of the Delivery Bar Code Sorter –
Expanded Capability (DBCS-EC). In addition, these concerns could affect future Postal
Service initiatives.

Background

On August 7, 2000, the Board of Governors approved $55.3 million in capital funds
and $750,000 in expense funds for the development of DBCS-EC[1] systems. On
September 8, 2000, the Postal Service issued a letter contract for this project. On
September 28, 2001, the Postal Service awarded the contractor a $48.3 million firm-
fixed price contract. In April 2003, the Postal Service completed deployment of all
84 DBCS-EC machines.

The purpose of the DBCS-EC machine is to allow thick and flimsy (bulky) [2] letter mail,
which is primarily processed manually,[3] to be sorted on the Delivery Bar Code Sorter
machines. In March 2001, preproduction testing was performed, and the DBCS-EC
machine did not meet many of the statement of work performance requirements. In
November 2001, a first article machine was built and tested. This test was terminated
after 2 weeks due to unacceptable levels of mail damage. Afterwards, the contract was
modified lowering several performance requirements. A second test was conducted
during February 2002. The results of this test did not meet the modified contract

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[1] The Delivery Bar Code Sorter (DBCS) is a multi-level high speed bar code sorter for letter mail, which sorts mail in
delivery walk sequence eliminating the need for additional sorting at the delivery unit.
[2] Bulky expanded capability mail is thick and flimsy letter mail that meets certain height, thickness, and weight
ranges, which cannot generally be processed on the regular DBCS machine.
[3] The Decision Analysis Report states that although manual mail represents only around 8 percent of the total letter
mail in processing plants, over 50 percent of letter processing hours are spent in processing this volume.

requirements for the rate of damaged mail. Also, the test revealed excessive amounts of maintenance time were required to keep the machine operational.

After the two First Article Test failures[4] of the DBCS-EC, an operational evaluation, referred to as the Live Mail Study was performed. The purpose of the evaluation was to allow the contractor another opportunity to demonstrate the capability of their DBCS-EC, which the Postal Service could utilize to gain some economic efficiency. The Live Mail Study demonstration was not a pass or fail test such as a First Article Test, which is used to verify compliance with statement of work and Decision Analysis Report requirements prior to deployment authorization. After evaluation of the study, a decision was made to deploy.

Objectives, Scope, and Methodology

The objectives of the audit were to determine the adequacy of testing and evaluate machine utilization. During the course of our audit, we made several visits to sites with the machines including the First Article Test site in St. Louis, Missouri. We also interviewed Postal Service officials at headquarters and the Maintenance Technical Support Center, reviewed applicable policies and procedures, reviewed relevant documentation, and consulted with Office of Inspector General (OIG) experts. Also, we distributed a judgmental survey to many of the deployment sites to get feedback on overall machine performance.

This audit was conducted from October 2002 through September 2003, in accordance with generally accepted government auditing standards and included such test of internal controls, as were considered necessary under the circumstances. We discussed our conclusions and observations with appropriate management officials 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.

Results

The Postal Service's business decision to continue the DBCS-EC program without fully addressing the First Article Test failures did not ensure that the DBCS-EC could effectively process bulky mail without damaging the mail. We question management's decisions to disregard the results of the First Article Tests and subsequently revalidate performance through a demonstration, while also eliminating contractual requirements. Consequently, it appears management was disregarding the machines inability to meet the program objectives. We determined the Live Mail Study was a demonstration and

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[4] The contractor was told to stop work on deployment preparation, and to focus on correcting deficiencies identified during First Article Testing.

not a pass/fail test of contractual requirements, like a First Article Test. Also, the Test Evaluation and Quality group did not participate in the Live Mail Study. Thus, we question the independence of the demonstration and the data reliability. In addition, we found that many of the deployment sites are processing only small percentages of bulky mail and are utilizing the machine to process regular automation mail. If this continues, the efficiencies and savings of processing the bulky type mail on the DBCS-EC, which justified the program's approval, may not be realized.

The above issues impact another program in development, the Delivery Bar Code Sorter Input Output Subsystem-Expanded Capability (DIOSS-EC). This program utilizes similar technology. This program is part of a major effort to replace most of the multiline optical character readers. Postal Service management needs to address these issues during the development and deployment of the new DIOSS-EC.

Testing Process Was Incomplete

The Live Mail Study indicated a significant reduction in major damage to mailpieces occurred during the demonstration. Afterwards, the Postal Service made a business decision[5] to continue the program, modify the Decision Analysis Report,[6] and begin deployment. Equipment deployment started September 2002.

However, the demonstration was not an independent evaluation and did not ensure the system performed satisfactorily for the following reasons:

- The Test Evaluation and Quality Group did not manage, conduct, evaluate, and assess the results of the Live Mail Study, nor develop the test plan. The Live Mail Study indicates that the results from the second First Article Test were in dispute.

- The Live Mail Study results did not meet all the statement of work requirements, and some testing criteria and requirements were eliminated rather than being retested. The second First Article Test report states that the extremely high damage rate of the thick and bulky test decks during the test was a major problem. Subsequently, program management eliminated the contractual requirements for testing the bulky mail test decks and did not use them during the Live Mail Study.

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[5]The possibility of terminating the contract was explored. Nearly $27 million of the $55 million approved for the program had been expended without any deployment. Termination was not recommended and deployment was approved.

[6] A Decision Analysis Report modification was approved in August 2002, which changed the scope of the program from upgrading existing machines to purchasing new machines without any changes to the funding requirements.

- In September 2002, the DBCS-EC contract was modified, which eliminated all First Article Test performance issues. Due to this modification, the Live Mail Study allowed the program to proceed into production.

The Live Mail Study report states that after the contractor made final operating procedure changes, mail damage and maintenance time were significantly reduced. This may have occurred because the contractor had the leeway[7] to choose mail to process, providing the opportunity to improve the damage rates and reduce machine downtime. The statement of work requirement for the DBCS-EC was to have a greater ability to process mail types than existing Postal Service equipment.

We question how a demonstration, not a properly conducted test, can be a basis for approval[8] to deploy equipment. A previous audit report on the Test Evaluation and Quality group noted through benchmarking that effective test groups had significant involvement in determining whether equipment was accepted or rejected. However, the Test Evaluation and Quality group was not involved in the decision to deploy. We will continue to monitor engineering management's departure from this best practice for effective acceptance processes.

Further, the DBCS-EC Decision Analysis Report stated that the approach to purchasing a small number of the new machines would ensure thorough testing before more complex DBCS's equipped with other subsystems are modified. Engineering recently initiated a multiline optical character reader replacement program. The program is in development and a formal approval decision is not scheduled until later this year. Part of the planned program includes purchasing new DIOSS-EC machines.[9] An Engineering program official indicated that several hundred of the DIOSS-EC machines might be purchased under this program.

Recommendation

We recommend the vice president, Engineering:

1. Direct the Test Evaluation and Quality group to evaluate the DBCS-EC testing process and results, and ensure all testing of the DIOSS-EC is conducted under the direction and approval of the group.

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[7] According to the Live Mail Study plan, the contractor was allowed to choose mail to process, but limited to deselecting pieces that do not fit the specific size descriptions of bulky mail. The plan also indicates that the contractor was allowed to evaluate mail and accept or reject the mail as being able to run on the DBCS-EC.
[8] The Decision Analysis Report modification states that the Live Mail Study operational evaluation, was not a full scope First Article Test, but it gave the Postal Service an opportunity to evaluate the DBCS-EC under operational conditions. Also, the Live Mail Study indicated that the results of the demonstration in no way resolve or waive any contractual requirements or outstanding DBCS-EC First Article Testing criteria.
[9] The DIOSS-EC comes equipped with expanded capability stackers and feeders. It is supposed to be an improvement over the 84 DBCS-EC's. Its reader/elevator is increased by 6 feet to better handle the bulky mail.

Management's Comments

Management agreed with our recommendation stating that the Engineering Test, Evaluation and Quality group should review and evaluate the DBCS-EC testing process and results prior to and in preparation for the DIOSS-EC testing, which is scheduled for January 2005. In addition, management states that the current plan is to have the group conduct the DIOSS-EC First Article Testing. Management's comments, in their entirety, are included in the appendix of this report.

Evaluation of Management's Comments

Management's comments are responsive to the recommendation. Management's actions taken or planned should correct the issues identified in the report. We plan to begin a review during calendar year 2004 of the multiline optical character reader replacement program, which includes the DIOSS-EC component. As such, we plan to follow up on these planned actions.

Sites Indicate DBCS-EC not Fully Utilized as Intended

The Postal Service completed deployment of all 84 DBCS-EC machines in April 2003. We sent surveys to 20 of the sites to determine utilization. They indicated they were generally utilizing the new machines to sort various types of letter mail. Many of the sites claimed they were processing only small percentages of the bulky mail and mostly processing regular automation mail[10] on the DBCS-EC machines. The low usage of these machines for bulky type mail appears to be caused by the following:

- A lack of bulky type mail available at certain plants.

- Plant personnel are still manually processing bulky mail and using other automated equipment[11] besides the DBCS-EC despite headquarters guidance.

- Plant personnel expressed concerns about the DBCS-EC ability to efficiently process bulky mail and excessive machine maintenance.

Headquarters, Engineering, and Operations were unable to determine what quantities of bulky mail were being processed on the DBCS-EC machines. Also, they did not have specific goals for processing bulky mail. As a result, there was no assurance that the

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[10] The DBCS-EC can process both regular automation and expanded capability bulky mail. Program management and headquarters Operations could not state definitely what percentages of these two types of mail the new machines should be processing. An operator's manual indicated that the machine should be able to process about 26 percent of a plants total manual expanded capability mail. We found most plants were processing much less than this percentage of the total plant available expanded capability bulky volume.

[11] A headquarters Operations official indicated that at this time a number of sites still utilize the multiline optical character reader Bulky and Mail Processing Bar Code Sorters – Chunky to handle the manual type volumes and are using the DBCS-EC as a regular DBCS to process delivery point sequenced mail.

efficiencies and savings estimates for processing bulky mail on the DBCS-EC will be realized.

Recommendation

We recommend the vice president, Engineering:

2. Determine whether the DBCS-EC actual performance for processing bulky type mail is sufficient to meet the Decision Analysis Report projected savings.

Management's Comments

Management agreed with our recommendation stating that efforts are in place to review and address equipment performance. A review is expected to be completed October 15, 2003.

Evaluation of Management's Comments

Management's actions taken or planned should correct the issues identified in the report. When we begin a review of the multiline optical character reader replacement program in calendar year 2004, we will look at the DBCS-EC performance data and any design changes in conjunction with the development of the DIOSS-EC program.

General Comments

Management included comments and concerns about the report's findings and conclusions. Management states the decision to purchase and deploy the 84 DBCS-EC machines was sound, clearly supported by the events and situation, and in the best interest of the Postal Service. Management also commented that the First Article Test failures were reasonably addressed and the Postal Service received compensation, after renegotiating, to procure and deploy the 84 new machines.

Response to Management's General Comments

We partially agree with management's statement in the report that they made a business decision to purchase and deploy DBCS-EC machines given the situation and the events. We also noted at the time of the decision the program had expended significant funds without any deployment of equipment.

However, in its comments, management did not clearly agree or disagree with our conclusions regarding the lack of independence and data reliability for the Live Mail Study and the lack of follow up of the First Article Test failures. We agree the Test, Evaluation and Quality group did follow the testing process policies. The group issued a final test report, which stated that serious performance issues existed at completion of the second First Article Test. However, we found no indication the group was included

in resolving documented concerns, or consulted to develop the Live Mail Study and validate the test data. After the First Article Test dispute and the live mail study, changes were made to the statement of work, which essentially eliminated all First Article Test performance issues. We may look into this process more closely in a planned audit of the functioning and effectiveness of the Technology Acquisition Management group.

We appreciate the cooperation and courtesies provided by your staff during the audit. If you have any questions or need additional information, please contact Tracy A. LaPoint, director, Developmental, at (703) 248-2100 or me at (703) 248-2300.

Ronald D. Merryman
Deputy Assistant Inspector General
  for Technology/Oversight

Attachment

cc: John A. Rapp
       Mary Anne Gibbons
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MANAGEMENT'S COMMENTS

THOMAS G. DAY
VICE PRESIDENT
ENGINEERING

UNITED STATES
POSTAL SERVICE

September 15, 2003

RONALD MERRYMAN
DEPUTY ASSISTANT INSPECTOR GENERAL
for TECHNOLOGY/OVERSIGHT

SUBJECT: Response to OIG Draft Audit Report on the Delivery Bar Code Sorter –
             Expanded Capability

The following is Engineering's response to the OIG's Draft Audit Report on the Delivery Bar Code Sorter – Expanded Capability (Report number DA-AR-03-DRAFT) provided on August 15, 2003.

Overall, we generally concur with the report's two specific recommendations. However, prior to responding to these, we have some general comments and concerns about some of the reports findings and conclusions.

We believe the decision to purchase and deploy the 84 DBCS-EC's was sound, clearly supported by the events and situation, and in the best interests of the Postal Service.

Unlike the report suggests, the DBCS-EC First Article Test results were not disregarded in making this decision. In fact, these tests showed that the machine performed much better than expected or required in many areas. Throughput, jam rate, and system sort rates of the machine all exceeded requirements, some by considerable margins. While it is true that damage rates did not meet specifications, all reasonable efforts to address this problem were pursued. Furthermore, USPS received compensation for the program delay and non-performance associated with the damage rate when the contract was renegotiated to 84 new machines.

A combination of events supported the decision to alter original plans by purchasing and deploying the 84 new DBCS-EC machines. As discussed above, the First Article Test showed that, with the exception of damage rates, the machine performed admirable. These results led to the decision to next focus efforts on determining impacts of the machine in a live operating environment. At the same time, current conditions indicated that purchasing 84 new machines instead of largely upgrading existing machines would provide additional processing capacity, therefore added benefits. Consideration of all of the above showed that deployment of the equipment would indeed produce sufficient benefits for the Postal Service. In fact, the economics for the program were improved by this decision as indicated by nearly a 20 percent increase in the program's originally projected net present value.

Recommendation

We recommend the vice president, Engineering:

1. Direct the Test, Evaluation, and Quality group to evaluate the DBCS-EC testing process and results, and ensure all testing of the DIOSS-EC is conducted under the direction and approval of the group.

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Response: Our normal process is to have Test, Evaluation, and Quality conduct First Article Tests; current plans already are to have this group conduct DIOSS-EC First Article Testing. We concur that this group should review and evaluate the DBCS-EC testing process and results. This review will be conducted prior to and in preparation for the DIOSS-EC testing, schedule for January 2005.

As cited in our response to OIG Audit DA-AR-02 (July 26, 2002), Engineering has established formal policies and procedures for testing. These procedures became effective August 1, 2002 and will be adhered to for all future testing conducted by Test, Evaluation and Quality.
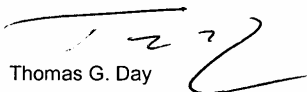
Recommendation

We recommend the vice president, Engineering:

2. Determine whether the DBCS-EC actual performance for processing bulky type mail is sufficient to meet the Decision Analysis Report projected savings.

   Response: We concur with the recommendation to further review DBCS-EC performance. In fact, efforts to review and address equipment performance are already underway. Additionally, our preliminary review of equipment utilization suggests that the volume processed by these new machines is well in excess of that needed to produce the level of savings contained in the Decision Analysis Report. The review is expected to be completed by October 15, 2003.

In summary, we believe the decision to purchase and deploy the 84 new DBCS-EC machines was sound. As is our normal policy, we will be relying on our Test, Evaluation, and Quality group for future first article testing. And, while preliminary indications are that the equipment is processing sufficient mail to meet savings projections, we continue to review performance. We will continue to work on improving the machine and have made some design changes that will be integrated into the next generation of DBCS-EC machines that are purchased.

We appreciate the opportunity to respond to your report. If you would like any further information, please contact Tom Shipe at 703-280-7879.

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