



Library Services

National Library Service for the Blind and Physically Handicapped

*NLS Effectively Planned and Implemented
the Digital Conversion, But Needs to
Reduce Its Requirements Projections*

Audit Report No. 2011-PA-104
October 2011

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UNITED STATES GOVERNMENT

LIBRARY OF CONGRESS

Memorandum

Office of the Inspector General

TO: James H. Billington
Librarian of Congress

October 17, 2011

FROM: Karl W. Schornagel
Inspector General

A handwritten signature in black ink, appearing to read 'Karl Schornagel'.

SUBJECT: *NLS Effectively Planned and Implemented the Digital Conversion,
But Needs to Reduce Its Requirements Projections*
Audit Report No. 2011-PA-104

This transmits our final report summarizing the results of the Office of the Inspector General's audit of the National Library Service for the Blind and Physically Handicapped (NLS) digital talking book program. The executive summary begins on page *i* and our complete findings and recommendations appear on pages 9 to 24.

Based on the written comments to the draft report, we consider all of the recommendations resolved. Please provide, within 30 calendar days, an action plan addressing implementation of the recommendations, including an implementation date, in accordance with LCR 2023-9, *Rights and Responsibilities of Library Employees to the Inspector General*, §6.A.

We appreciate the cooperation and courtesies extended by NLS during this audit.

cc: Chief of Staff
Associate Librarian for Library Services
Director, Partnerships & Outreach Programs
Acting Chief, National Library Service for the Blind and Physically Handicapped

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▶▶ EXECUTIVE SUMMARY

The Library's National Library Service for the Blind and Physically Handicapped (NLS) administers a free program, which provides reading materials to individuals who are blind or physically handicapped. The NLS implements its program through a network of regional and sub-regional libraries that distribute NLS audio books, playback equipment, and Braille publications to eligible borrowers at no cost.

We conducted this performance audit to evaluate NLS's plans for, and implementation of, a digitally-based Talking Book Program, which includes the manufacture and distribution of digital talking book machines (DTBMs), and the duplication of digital talking books on flash cartridges. Summaries of our audit's results are as follows.

NLS's Project Planning and Processes Resulted in an Effective Digital Program—NLS took steps to actively and effectively involve stakeholders in the project, especially before the new digitally-based system was fully deployed. This ensured that NLS could identify the system's problems in a timely manner and take corrective action when necessary. By maintaining active communication with stakeholders and conducting testing on a pilot project basis, NLS demonstrated effective project management.

NLS Should Reduce its Estimate of DTBMs Needed—In December 2010, NLS projected that the program should have about 741,000 DTBMs available for loans. During our fieldwork, NLS made the decision that the 550,000 DTBMs already purchased should generally be adequate for Fiscal Years (FY) 2012 and 2013. Before committing to purchasing more DTBMs, NLS wants to refine its estimates. Further, instead of "pushing" machines to the network, NLS will now react to demand from the network libraries for additional DTBMs. We agree with NLS' decision to delay purchasing more DTBMs. Our estimates indicate that 550,000 should be sufficient for the short-term; this will result in a savings of about \$14.8 million. We recommend that NLS: 1) reevaluate its projections of DTBM requirements and 2) encourage all network libraries to periodically review their patron records and remove inactive accounts.

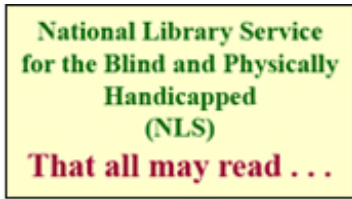
NLS Needs to Reflect BARD Use in Its Budget Request to Produce New Titles on Flash Cartridges—NLS' Braille and Audio Reading Download (BARD) service results in more efficient service to the patron and savings to NLS by not having to duplicate as many copies of a title on a flash drive cartridge. However, NLS has not factored the program efficiency benefit that the service yields into its budget requests for talking book production. An estimated 13.8 percent of NLS's patrons have registered to use BARD and registration is on the upswing. We recommend that NLS amend its FY 2012 and 2013 budget requests by reducing the requested funding for duplicating new titles by at least 15 percent each year. This would reduce the program's funding by about \$2.3 million per year.

NLS Needs to Determine the Full Costs of Its Products and Services to Better Inform the Congress and States—NLS reported to the network regional libraries that the FY 2010 federal investment for a DTBM was \$156.38 and \$12.80 for a digital book in English. However, these costs do not include dollar allocations for approximately \$14 million in compensation (i.e., salaries and benefits) for NLS's staff nor the cost for NLS' rental space. We recommend that NLS apply *Managerial Cost Accounting Concepts and Standards for the Federal Government* to internal and external reports it develops regarding the Talking Book Program's costs.

NLS Inventory Control is Adequate, But Issues Stemming From Present Non-Integrated Systems Must Be Resolved—We confirmed that NLS is effectively tracking and accounting for the DTBMs it distributes to the network regional libraries. However, the systems that the 56 network libraries presently use to track the whereabouts of DTBMs assigned to patrons are not integrated and the data is not reliable. NLS is exploring options for implementing a new integrated system to help address shortcomings. We also found that 31 of the 56 network libraries reported that they had not performed statistical testing of their DTBM inventories as recommended by NLS. We recommend that NLS explore the cost benefits of testing DTBM inventories as part of its periodic site visits to the network libraries to ensure appropriate accounting for the DTBMs provided by NLS.

Management generally concurred with our findings.

▶▶ BACKGROUND



The Library of Congress, National Library Service for the Blind and Physically Handicapped (NLS) administers a free national library program of reading materials for individuals who are visually or physically handicapped. The program was established to implement provisions of the Pratt-Smoot Act of 1931¹ and currently serves approximately 438,000 patrons and institutions.

The program was originally designed to serve blind adults. However, its services were opened to blind children in 1952 when an amendment to the Act deleted the word “adult” from the basic legislation. Other important developments occurred in 1962, when the program began collecting and maintaining musical materials, and in 1966, when program eligibility was extended to individuals with other physical impairments that limit the ability to read standard print.

NLS currently operates with 118 full-time equivalent personnel positions. Funding for its operations, provided annually through congressional appropriations, totaled about \$70 million for fiscal year (FY) 2011.

Program Implementation and Financial Support

The NLS program is implemented through a network² of 56³ regional libraries along with 46 sub-regional libraries, and four autonomous Machine Lending Agencies (MLAs), which distribute NLS audio books, playback

¹ 2 U.S.C. § 135a authorizes annual funds to be appropriated to the Library of Congress to provide Braille books, sound-reproduction recordings or in any other form, and for purchase, maintenance, and replacement of reproducers for the use of the blind and for other physically handicapped residents of the United States, including the several States, Territories, and the District of Columbia.

² 2 U.S.C. § 135b states that NLS may arrange with public or other nonprofit libraries, agencies, or organizations to serve as local or regional centers for the circulation of books, recordings, musical scores, instructional texts, and other specialized materials.

³ Four states—California, Michigan, New York, and Pennsylvania — have two regional libraries each and there are regional libraries in the District of Columbia, Puerto Rico, and the Virgin Islands. Wyoming is served by Utah and does not have a regional library.

equipment, and Braille⁴ publications to eligible borrowers at no cost. The library network is financially supported at the federal, state, and local levels. Some network libraries also receive private funding.

Program equipment and reading materials are sent to borrowers and returned to libraries by postage-free mail as part of the U.S. Postal Service's "Free Matter for the Blind or Handicapped." To promote a uniformly high level of service, NLS establishes policies and procedures for network activities and actively monitors the distribution process.

Program Eligibility

The NLS program is available to qualifying individuals (i.e., any resident of the United States or citizen living abroad who is unable to read or use regular print materials because of temporary or permanent visual or physical limitations), institutions, and schools for the blind and physically handicapped.⁵ To qualify, a patron must complete an application form and have a competent authority⁶ certify that the applicant is unable to read standard printed material because of a physical limitation. The application form also alerts the patron as follows:

"Playback equipment and accessories are supplied to eligible persons on extended loan. If this equipment is not being used for reading recorded material provided by the Library of Congress and its cooperating libraries, please return it to the issuing agency."

⁴ Braille is a system of writing for the blind that uses characters made of raised dots.

⁵ 36 C.F.R. PART 701.6e authorizes reading materials and sound to be reproduced for the use of blind and physically handicapped persons and which may be loaned to qualifying individuals, institutions, and schools for the blind and physically handicapped.

⁶ Doctors of medicine; doctors of osteopathy; ophthalmologists; optometrists; registered nurses; therapists; and professional staff of hospitals, institutions, and public or private welfare agencies (e.g., social workers, caseworkers, counselors, rehabilitation teachers, and superintendents). In the absence of any of these, certification may be made by professional librarians or by any person whose competence under specific circumstances is acceptable to the Library of Congress.

NLS's Audio Book Program

Audio books and playback equipment have evolved over the course of NLS's 80-year history. NLS initially recorded audio books on vinyl albums and later, recorded them in analog format on cassette tapes. Eventually, in the 1990s, NLS recognized that analog audiocassette technology was becoming outdated and initiated efforts to plan for a new, digitally-based talking book system that would include download capability.

NLS is currently finishing-up transitioning its audio book program from analog to digital format. Presently, digital talking-book machines (DTBMs) are loaned free for use with NLS reading material recorded on flash cartridges or on cassettes.⁷ As of May 9, 2011, NLS had contracted for the production of 494,808 DTBMs. NLS will have nearly 550,000 DTBMs available to loan to users by 2013 if all production options of the current book machine contract are exercised. Figure 1 identifies some key events in NLS's transition to digital technology, and NLS's plans for ordering DTBMs through the end of FY 2013.

DTBMs are available in standard and advanced models. The advanced model includes more operational features, such as greater capability to navigate throughout a book. As of May 2011, 288,430 NLS digital players (226,803 standard models and 61,627 advanced models) had been distributed to readers through network library assignments. Figure 2 shows the standard model DTBM accompanied by a flash cartridge, and the advanced model of the machine.

⁷ As part of its transition to digital, NLS still has to deploy the conversion of magazines to digital format, convert selected analog items from its collection to digital, dispose of cassettes and cassette players, and implement the planned duplication on demand centers.

NLS Digital Talking Book Machine Chronology and Plans	
Fiscal Year	Action Taken or Planned
2005	<ul style="list-style-type: none"> NLS awards design contract for DTBM player and media.
2006	<ul style="list-style-type: none"> Last cassette machine manufactured.
2007	<ul style="list-style-type: none"> NLS requests supplemental funding of \$75,000,000 over four years for rapid conversion to an all-digital program. Congress provides full funding over six years (\$12,500,000 per year). NLS estimates 600,000 DTBMs are required. DTBM design contract concludes (deliverables include electrical, mechanical, and software designs and prototype players and cartridges).
2008	<ul style="list-style-type: none"> DTBM manufacturing contract awarded in June. Initial cost is approximately \$155 per machine (including per player licensing fees). Delivery order issued for pilot/pre-launch and production DTBMs. Pilot and pre-launch DTBMs delivered and tested.
2009	<ul style="list-style-type: none"> DTBM mass production and delivery to network libraries/MLAs commences at a rate of 20,000 per month. No delivery orders issued in FY 2009. No-year funds held over for DTBM purchase in FY 2010.
2010	<ul style="list-style-type: none"> Delivery orders issued for 271,600 DTBMs.
2011	<ul style="list-style-type: none"> NLS issues delivery order for purchase of 50,000 DTBMs.
2012	<ul style="list-style-type: none"> NLS does not plan to issue an order for additional machines.
2013	<ul style="list-style-type: none"> NLS plans to issue delivery order for the purchase of 30,000 additional DTBMs (possibly more depending on outreach plans and actual loss rate).

Figure 1: NLS Digital Talking Book Machine Chronology and Plans

NLS's Audio Book Production

NLS produces approximately 2,000 audio books annually. The book titles are selected by NLS staff in consultation with a collection development committee that includes representatives from several of the network libraries. Selections are based on a book's appeal across a wide range of interests, including bestsellers, biographies, fiction, and how-to books, and include a limited number of Spanish titles. While NLS's selections cover a wide spectrum, the majority of selections are current adult fiction.

NLS duplicates up to an average of 1,000 copies of each of the 2,000 audio books annually selected for production. The actual number of copies per title varies because they are driven by the actual orders from the network regional libraries. NLS then distributes the copies to the regional libraries, which make the books available for loans to program patrons. NLS uses two

bimonthly publications – *Braille Book Review* and *Talking Book Topics* – to inform registered borrowers of the titles that it adds to the audio book collection.

Braille and Audio Download Service

NLS's program patrons no longer have to wait as many as six days for digital talking books and magazines to arrive in the mail. Instead, they may use computers to download directly those materials from the Internet using NLS's Braille and Audio Reading Download (BARD) service.⁸ Currently, there are more than 18,000 audio book titles and 40 magazine titles available through the BARD website. Access to the website is restricted to eligible readers and requires the use of unique login IDs and passwords.



Figure 2: Advanced (top) and standard DTBM with flash cartridge.

The Chafee Amendment

In 1996, Congress took a significant action that has benefited the NLS program and its patrons. Specifically, Congress amended the Copyright Act (i.e., 17 U.S.C. § 121, the "Chafee Amendment") to eliminate the need for government and nonprofit agencies to seek permission from publishers or copyright owners to reproduce printed materials in special formats for blind or physically handicapped readers. As a result, NLS is able to produce books more quickly than before, which greatly enhances service to its patrons.

Recent Program Reviews

In the spring of 2006, we performed a survey⁹ of NLS's plans to convert the principal technology for its audio book program. Those plans called for digital books and equipment to begin replacing analog cassette books and machines in FY 2008, and for digital to become the program's primary technology by FY 2011. We reported that although

⁸ Using BARD requires that the patron have access to a computer with high speed Internet connection and a NLS cartridge and USB cable.

⁹ *Survey – Conversion to Digital Talking Books*, Report 2006-PA-101 issued August 23, 2006.

NLS had not rigorously followed government acquisition and project planning criteria, its process should yield valid results. We recommended specific steps NLS should take to more closely follow project-planning standards.

In the fall of 2006, Congress asked the Government Accountability Office (GAO) to review NLS's planning and management of its digital talking book development and acquisition project.¹⁰ In its 2007 report, GAO concluded that "NLS analyzed various alternatives for the digital talking book program starting in 2000, but the analyses did not have the rigor recommended by library guidance and government and industry best practices to ensure that new assets are acquired through sound decision making."

GAO's principal recommendations were that NLS should develop and document 1) analyses of technology options for modernizing its Talking Book Program, and 2) concept of operations and risk management plans describing how the talking book system is to operate and identifying risks that the modernization project could face. The NLS complied with both GAO recommendations.

¹⁰ *Talking Books for the Blind*, GAO-07-871R issued June 12, 2007.

► OBJECTIVES, SCOPE, AND METHODOLOGY

We conducted this performance audit to evaluate NLS's plans for, and implementation of, a digitally-based Talking Book Program, which includes the manufacture and distribution of DTBMs, and the duplication of digital talking books on flash cartridges.

Our audit objectives were to determine whether NLS:

- 1) took appropriate actions before the digital system was fully implemented to ensure that possible system problems would be identified and addressed in a timely manner;
- 2) used appropriate data and applied sound methodology in developing projections for DTBM and flash drive cartridge requirements;
- 3) provides complete accountability for the federal funds annually appropriated for the program; and
- 4) effectively tracks and accounts for DTBMs issued.

We limited the scope for most of our work to NLS's digital activities during FYs 2010 and 2011. However, we researched historical data for the period FY 2000 through FY 2010 to identify trends for our analysis of "active readers." In addition, we took an estimate, developed by NLS in 2007, into consideration in our analysis of NLS's projected requirements for DTBMs.

Our audit methodology included conducting interviews with NLS officials, corresponding with officials of selected network regional libraries, and reviewing NLS's annual reports, inventory records, and budget requests. It also included:

- referring to the *Library of Congress Project Management Handbook, Version 1.1*, dated December 2, 2010,¹¹ in our assessment of NLS's project management activities;

¹¹ Material in the *Library of Congress Project Management Handbook* provides project management tools and techniques from the *Guide to the Project Management Book of Knowledge, Third Edition*, published by

- collecting feedback from several network libraries on patron experiences with the DTBM;
- collecting information on NLS's BARD service, including the level of patron registration, and patron perspectives on using the service.
- interviewing officials of close-by network regional libraries in Maryland, Virginia, and Washington, DC regarding the quality of communication and guidance that NLS provided on the launch of the digital program; and
- conducting on-site tests of the DTBM inventory records maintained by the three close-by regional libraries.

We conducted this performance audit from December 2010 through July 2011, in accordance with generally accepted government auditing standards, and Library of Congress Regulation (LCR) 211-6, *Functions, Authority, and Responsibility of the Inspector General*. 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.

the Project Management Institute (PMI). PMI is one of the world's largest professional membership associations, with half a million members and credential holders in more than 185 countries. A not-for-profit organization, it advances the project management profession through globally recognized standards and certifications, collaborative communities, an extensive research program, and professional development opportunities.

►► FINDINGS AND RECOMMENDATIONS

Overall, we concluded that NLS's project to modernize its talking book system has resulted in a successful and dynamic digital program. However, we question NLS' growth expectations for the program and we make recommendations to improve accountability over program assets. Our audit results follow.

I. NLS's Project Planning and Processes Resulted in an Effective Digital Program

It is important to identify the stakeholders of a project before the project is underway and keep them involved at all stages of the project's life. According to the *Library of Congress Project Management Handbook, Version 1.1*, "[d]ecisions made in the LC PM [Library of Congress Project Management] life cycle demand open and constant communication among decision makers and other significant stakeholders."

NLS's project to modernize its talking book system has resulted in a successful and dynamic digital program. The program's success is substantially attributable to steps NLS took to actively and effectively involve stakeholders in the project, especially before the new digitally-based system was fully deployed.¹²

Before NLS launched the new system, it pilot-tested the DTBM, flash cartridge, and mailing container. To perform the test, NLS sent 544 players (440 standard models and 104 advanced models) and almost 2,000 digital book titles on cartridges (54 different titles with 37 copies of each title) to eight regional libraries. Those libraries were instructed to encourage participating patrons to vigorously use the new player to see how robust it is, and to note any technical or operational problems that they encounter (e.g., buttons sticking, issues with the battery, problems with playing and/or navigating a digital book, etc.). Through this test, NLS

¹² Although NLS has delivered DTBMs to patrons and is producing new titles on flash cartridges, it still is in the process of converting magazines and retrospective collection titles to the digital format, developing "duplication on demand" centers (which will allow patrons to download via the Internet titles not available on flash cartridges), and disposing of the older cassette machines and cassettes.

collected useful information on the DTBM's functionality and a variety of other matters (e.g., the DTBM tracking system and assignment process, criteria for distributing machines and drawing up machine waiting lists, an appropriate regional library supply of standard and advanced model DTBMs, etc.).

After the pilot test concluded, NLS surveyed all 56 network regional libraries to assess their ability to receive, process, and distribute DTBMs. The survey's results confirmed the agencies' readiness to implement the digital system. NLS also confirmed that the appropriate mix of DTBM models for a regional library should be 80 percent standard and 20 percent advanced. Some of the survey questions were:

- Have you tested and verified that your scanning equipment and automation system will accept barcodes on DTBMs?
- Have you actually tested and verified that your automation system will process model codes for the two types of DTBMs (standard and advanced)?
- What is the maximum number of DTBMs (individual units) that you will be able to stage in your facility?
- What is the maximum number of DTBMs (individual units) that you will be able to issue (i.e., assign and ship, to patrons per workday)?

In our opinion, the processes NLS performed before it fully deployed the new system ensured that it could identify the system's problems in a timely manner and take corrective action when necessary. Moreover, NLS ensured that stakeholders of the modernization project were kept up-to-date, and provided opportunities to ask questions and make suggestions. By maintaining active communication with stakeholders, NLS demonstrated effective project management.

Recommendation

None.

II. NLS Should Reduce its Estimate of DTBMs Needed

In an estimate developed in December 2007, NLS projected that about 665,500 DTBMs should be available for loans to patrons through its Talking Book Program. The methodology

used to develop that estimate was systematic and rational. Furthermore, NLS periodically adjusted the estimate as it collected more data from its prelaunch and pilot testing activities, and refined its assessment of readership trends.

NLS re-estimated the DTBM requirements most recently in December 2010, projecting that the program should have about 741,000 machines available for loans. We believe this projection is excessive as detailed below.

During our fieldwork, we advised NLS of our intention to recommend large reductions in the number of DTBMs to be purchased. Just before this draft report was issued, NLS informed us that it had decided not to purchase any DTBMs beyond the 550,000 within the scope of the current contract.¹³ NLS thinks 550,000 DTBMs should be adequate for FYs 2012 and 2013 with more possibly needed to accommodate repairs, and to replace lost, discarded, or damaged machines. We agree.

Before committing to purchasing more DTBMs, NLS wants to refine its estimates by assessing 1) how successful the network is in finding the hard to reach cassette users, 2) the impact of the magazine program switching from analog to digital and forcing users to move to the DTBM, and 3) the outreach to qualifying institutions. Further, instead of the previous model of “pushing” machines to the network, NLS will now react to demand from the network libraries for additional DTBMs.

We agree with NLS’ decision to delay purchasing more DTBMs. Our analysis indicates that 550,000 DTBMs are adequate for present demand and to provide back-up to cover repairs and lost/damaged/discarded machines. We believe NLS’s December 2010 projection is excessively high because it is based on inflated data that the organization used in making its calculation, and overly optimistic assumptions regarding the program’s growth. We estimate that nearly \$14.8 million would have been wastefully invested had NLS relied on its 2010 estimate to acquire more DTBMs for the program because a substantial number of machines would likely not be borrowed in the coming years.

¹³ As of May 9, 2011, NLS had contracted for 494,808 DTBMs and plans to accept the last option year for an additional 50,000 for a total of nearly 550,000.

Figure 3 shows the elements that NLS included in its 2007 and 2010 estimates of DTBMs required to meet program demands. It also provides low and high estimates of required machines that we calculated to demonstrate the effect of NLS’s inflated and overly optimistic assumptions on its December 2010 projections. Explanations of the differences in our low and high estimates are included in our analysis of NLS’s estimates, which is provided following Figure 3.

NLS’s Projections of DTBMs Required and Our Revised Estimates					
	NLS’s Projections			Our Revised Estimates	
	12/31/2007	7/16/2010	12/28/2010	Low (Probable)	High (Possible)
Cassette Machines issued as of 12/2007	508,719			508,719	
Decrease in Active Readers 2007 to 2010 ¹⁴				(62,152)	
Active Readers		461,652	438,863		438,863
Institutional Patrons		179,752 (factor of 8)	72,144 (factor of 2)		72,144 (factor of 2)
Subtotal	508,719	641,404	511,007	446,567	511,007
Growth/Institutional Outreach	50,800 (10%)	64,140 (10%)	125,000 (25%)		51,100 (10%)
Subtotal	559,519	705,544	636,007	446,567	562,107
In Repair/Awaiting Repair		56,444 (8%)	7,000 (1%)	4,466 (1%)	5,600 (1%)
Reserves	76,000(15%)	Not included	70,000 (10%)	44,656 (10%)	56,200 (10%)
Replace Lost/Discarded/Damaged	30,000 ¹⁵	28,222 (4%)	28,000 (4%)	17,863 (4%)	22,400 (4%)
TOTAL	665,519	790,210	741,007	513,552	646,307

Figure 3: NLS’s Projections of DTBMs Required and Our Revised Estimates

Analysis of NLS’s Requirement Projections for DTBMs

Our analysis of elements included in NLS’s 2007 and 2010 projections of DTBMs required for the Talking Book Program is provided in the following paragraphs. It is important to note that despite the application of modern estimating techniques, demand forecasts must still be recognized as *estimates* that could later prove to be inaccurate due to information and/or circumstances unknown at the times the forecasts are developed. We give NLS credit for its decision to

¹⁴ NLS reported a 12.4 percent decline in active readers from a high of 501,015 in 2007 to 438,863 in 2010.

¹⁵ NLS data indicated a loss rate of 2 percent of machines per year. The digital transition was expected to take four years and thus the loss would be 3,000, 6,000, 9,000, and 12,000 respectively as the numbers increased (30,000 over the four years).

delay ordering additional machines until it can collect information that is more precise from the network libraries.

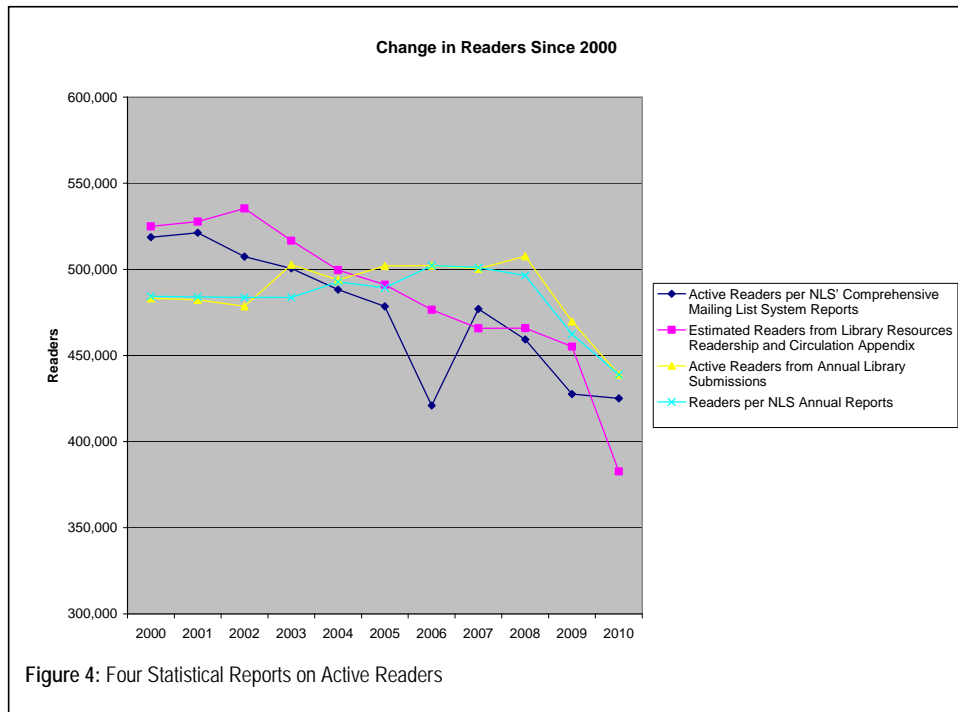
Active Readers

Figure 3 shows that NLS used the “machines issued” statistic – 508,719 – as the basis for its 2007 projection of total DTBM requirements. The source of that statistic is NLS’s December 2007 Monthly Machine Report (MMR). The assumption supporting NLS’s 2007 approach was that most, if not every patron with a cassette player would want to borrow a DTBM too. We agree with that assumption and believe that the methodology NLS used that year was sound.

NLS altered its approach in 2010. Instead of using the “machines issued” statistic, it began using “active readers” – shown in Figure 3 as 438,863 in December 2010 – as its basis for projecting total DTBM requirements. We question whether 438,863 is a reliable statistic for four reasons:

1. Statistics on “active readers” are included in four separate NLS reports and the statistics on that item are significantly different in all four cases (see Figure 4 below).
2. Figure 3 shows NLS’s subtotals of “active readers” plus institutional patrons as 641,404 and 511,007 respectively in July and December 2010. Each of those subtotals is greater than the number of cassette machines issued – 508,719 – as of December 2007. This is contrary to the downward readership trend, which is reported in the four statistical reports referenced in Figure 4.
3. Information we obtained through interviews we had with officials at the Maryland, Virginia, and Washington, DC regional libraries disclosed that in all three cases, the data on “active readers” that NLS used in calculating its 2010 estimates were inflated.
4. NLS’ Comprehensive Mailing List System (CMLS) report for September 30, 2010 shows 63,696 patrons who did not have a talking book machine (patrons receiving hard copy Braille materials only). NLS

contends that these patrons could order a DTBM at any time and should be counted as active patrons. In our opinion, these patrons should not be counted as “active readers” until they are actually using a DTBM.



In our view, NLS’ data on “machines issued” is more reliable than its “active readers” statistics and a more reliable base for additional DTBMs required for the program. Consequently, we used the “machines issued” factor used in 2007 adjusted for the decline in active readers as the basis for our *low* projection of DTBM requirements.¹⁶

Readers per Institution

Figure 3 shows that NLS’s July and December 2010 projections respectively include estimates of eight and two readers per institution. In our opinion, the factor for July is significantly

¹⁶ We used the same basis that NLS used in December 2010 to calculate our high estimate of required DTBMs because while we believe this figure is high, it represents NLS’s best estimate given the data provided by the MLAs.

inflated, and the one for December is somewhat high, but acceptable. We based our opinion on interviews we had with representatives of network regional libraries in Maryland, Virginia, and Washington, DC who indicated that, in general, each institution in their jurisdictions only had one machine. They also told us that patients/residents in institutions who wanted to use DTBMs had machines personally loaned to them in many cases.

NLS may have used the inflated factor in July 2010 to continue to justify approximately the same total number of DTBMs that it projected in 2007 and used as the basis for the 2008 DTBM manufacturing contract. Although it reduced its machines per institution estimate to two last December, NLS may have continued justifying its 2007 DTBM projection again by including in its latest projection other variables (e.g., an institutional outreach program) which compensate for the reduction it made.

In repair/awaiting repair

Figure 3 shows that NLS used a rate of 1 percent for its December 2010 estimate of machines in repair status and awaiting repair. We concluded that that rate is reasonable based on information we obtained in interviews we had with representatives of the network regional libraries in Maryland, Virginia, and Washington, DC. NLS's 2007 projection included a 15 percent factor to provide a surplus for machines in repair, awaiting repair, and needed to cover for those in such statuses. However, that projection did not specifically break out a rate for machines in repair status/awaiting repair.

Replace lost/discarded/damaged

Figure 3 shows that NLS used a rate of 4 percent for its 2010 estimates of DTBMs required to replace lost, discarded, and damaged machines. Although the initial repair rate for DTBMs has been low (estimated at 1 percent or less), we concluded that the four percent rate NLS used in its 2010 estimates is reasonable based on the historical experience that NLS had with cassette machines, and information we obtained in interviews with representatives of network regional libraries in Maryland, Virginia, and Washington, DC.

Growth factor/outreach

In December 2007, NLS projected a 10 percent growth rate for its DTBMs. We consider this projection reasonable given that the trend for active readers had been upward from 2000 to 2007. However, the number of active readers declined 12 percent from 2007 to 2010. Consequently, we believe NLS should not have included any projections for growth in 2010. NLS' opinion is that the decline in active readers since 2007 is attributable to it not actively marketing its services during the transition to digital.

In December 2010, NLS included a patron/institutional outreach campaign factor in its DTBM requirements projection. It did so because it estimates that there are nearly 250,000 institutions eligible to receive DTBMs that are not currently participating in the digital program. A large percentage of these institutions NLS plans to target are Veterans Administration hospitals and schools. NLS believes these institutions will need more than one machine. This factor for an outreach campaign was not a consideration in previous NLS projections. The planned outreach equates to approximately 25 percent total as shown in Figure 3.

We question whether NLS's institutional outreach campaign will result in the projected demand given the recent downward trend in readership that is illustrated in Figure 4. As stated above, NLS is delaying ordering additional machines until it more fully assesses its outreach efforts.

Recommendations

We recommend that NLS:

1. Reevaluate its projections of DTBM requirements, giving consideration to our projections.
2. Encourage all network regional libraries/MLAs to periodically review their patron records and remove inactive accounts.

Management Response

Management concurred with our recommendations.

III. NLS Needs to Reflect BARD Use in Its Budget Request to Produce New Titles on Flash Cartridges

NLS has taken advantage of modern digital technology by creating its BARD website that makes digital talking books and magazines available for downloading to eligible NLS patrons. The BARD service is a very cost-efficient means to make program books available and an estimated 13.8 percent of NLS’s patrons have registered to use it in its early stages.

Although NLS deserves credit for incorporating BARD service in its program, it has not factored the program efficiency benefit that the service yields into its budget estimates for talking book production.

Because BARD service has been added to the program, we believe that NLS’s budget requests for production of new titles are overstated and should be reduced by 15 percent. Figure 5 shows that if budgeted book production is decreased, NLS would reduce the program’s costs by about \$2.55 million per year in FYs 2012 and 2013 (i.e., 15 percent applied to 2,000,000 copies at \$8.51¹⁷ apiece).

Digital Talking Book Production/Cost Estimates and Our Revised Estimates						
	FY 2012		FY 2013		Revised Production Factoring In BARD Use	
Titles	2,000		2,000		2,000	
Copies/Title	1,000		1,000		850	
Total Copies	2,000,000		2,000,000		1,700,000	
Cost:						
Blank Flash Cartridge	\$7.00	\$14,000,000	\$7.00	\$14,000,000		\$11,900,000
Container	\$0.76	\$1,520,000	\$0.76	\$1,520,000		\$1,292,000
Duplication	\$0.75	\$1,500,000	\$0.75	\$1,500,000		\$1,275,000
Cost per copy	\$8.51	\$17,020,000	\$8.51	\$17,020,000		\$14,467,000
					Difference	\$2,553,000

Figure 5: Digital Talking Book Production/Cost Estimates and Our Revised Estimates

NLS informed us that although it requested funding for 1,000 copies per new title, in reality it only produces what the network libraries order and this has proven to be less than 1,000 copies. Monies not used to duplicate the full 1,000 copies are used to help convert retrospective collection titles from analog to digital. We believe NLS’ budget requests should reflect best estimates including reduced demand for

¹⁷ \$7.00 for flash cartridge, \$0.75 for duplication, and \$0.76 for the container.

titles on flash cartridges due to BARD. Furthermore, NLS should use budgeted funding for the purposes intended, unless otherwise approved.

The materials that BARD service participants download account for about 24 percent of program books in circulation (see Figure 6). Moreover, it appears that BARD registration is on the upswing. Three of the libraries that we contacted in March 2011 reported increases in the service’s registration as of May 2011: Texas increased from 14.2 to 17.0 percent; Kentucky increased from 14.8 to 24.3 percent, and Missouri increased from 13.5 to 18.0 percent (see Figure 7).

BARD Registration and Use at Selected Network Regional Libraries as of March 2010		
Library Location	Percent of Patrons Registered for BARD	BARD Download as Percent of Total Circulation
California	18.5	27.0
Washington, DC	18.0	23.0
Kentucky	14.8	25.8
Maryland	8.0	29.0
Missouri	13.5	13.9
Virginia	8.0	12.0
Tennessee	15.0	25.7
Texas	14.2	34.1
Average	13.8	23.8

Figure 6: BARD Use at Selected Network Regional Libraries as of March 2010

BARD Registration at Selected Network Regional Libraries as of May 2011	
Library Location	Percent Registered
Arkansas	12.6
Arizona	11.4
Colorado	11.5
Georgia	9.7
Indiana	18.0
Kentucky	24.3
Missouri	18.0
Montana	7.2
New Hampshire	9.0
New Mexico	16.0
North Carolina	11.7
Oregon	19.0
Texas	17.0
Wisconsin	16.0
Washington	18.5
Average	14.7

Figure 7: BARD Registration at Selected Network Regional Libraries as of May 2011

NLS believes that the present level of BARD downloads is an atypical share of total program books in circulation. It contends that the 24 percent rate is due to the enthusiasm of early-adopters (e.g., building a personal library which could not be done with physical cartridges), ease of service use including the ability to browse titles, and the initial scarcity of books readily available on cartridges, among other things. NLS expects the BARD service portion of books in circulation to level off somewhere between 13 and 15 percent. Our expectation is more optimistic, considering data that is available on the general book trade – e-book sales grew 169.4 percent in 2010, while print book sales fell 24.8 percent in the same year.

NLS is exploring two plans to use its resources more efficiently and effectively, and to help reduce the \$14 million amount it has budgeted through FY 2013 for duplicating books on flash cartridges. First, it plans to reuse the flash cartridges (for example, have regional libraries return a portion of the cartridges used for a title that is no longer in high demand, such as a best seller issued a year or two ago). Although we agree that this plan will reduce program cost, we do not believe savings will be realized from the plan until the reused cartridges are circulated for a number of years. Accordingly, we do not think the plan will decrease program costs in FYs 2012 and 2013.

Second, NLS plans to capitalize on the BARD service capability by establishing download centers for patrons who are unable to access the service on their own (generally because they do not have personal access to the Internet). Under this plan, NLS would continue to produce 1,000 copies per year of popular titles. Other titles would be available solely through download, either directly, or through newly-created download centers. When implemented, this plan would save the program \$13.6 million per year (80 percent applied to 2,000,000 copies at \$8.51 apiece) minus the costs of duplicating titles at a download center.

We evaluated the possibility of calling for the network regional libraries/MLAs to duplicate new books for patrons who cannot access the BARD service. Although the states we contacted agreed that this was an interesting idea, they said that it would not be feasible for them to take this additional workload on, especially with the budget cuts that most state libraries are experiencing. The network libraries estimated it would take them 8-10 minutes to duplicate one book plus more time to create and apply a print/braille label for the book cartridge. One library told us that even if it trained and devoted its entire staff of 15 to such an initiative, it would not be able to keep up with the high demand for program books.

We concluded that a requirement for network libraries to duplicate books for patrons would be too difficult for NLS to establish at this time, especially in view of the current challenging economic conditions. Moreover, the efficiencies of scale that NLS achieves in its book duplication activities would be lost if responsibility for those activities was

transferred to the states. Accordingly, we believe that the plan to establish download centers is the right course of action for NLS to take. However, the establishment of those centers notwithstanding, NLS should immediately reduce its budget estimates of 2 million copies of new titles per year in FYs 2012 and 2013 by at least 15 percent to capitalize on the program efficiencies yielded through BARD.

Recommendation

We recommend that NLS amend its FY 2012 and 2013 budget requests by reducing the requested funding for duplicating new titles by at least 15 percent each year.

Management Response

Management stated that NLS does not automatically produce 1,000 copies of 2,000 books. "The libraries place orders for the titles they need. ...Because libraries order the books they need, we only duplicate what is demanded."

We believe NLS' budget requests should represent best estimates of actual production, which in this case, should have been less than 1,000 copies for many titles. We based our finding on NLS' budget request and anticipated production plan.

IV. NLS Needs to Determine the Full Costs of Its Products and Services to Better Inform the Congress and States

GAO, the Office of Management and Budget, and the Department of the Treasury established the Federal Accounting Standards Advisory Board (FASAB) in 1990. The purpose of the board is to develop accounting standards for the federal government after considering the financial and budgetary information needs of congressional oversight groups, executive agencies, and the needs of other users of federal financial information. Although the standards that the board develops pertain specifically to executive branch agencies, the Library has elected to process its accounting transactions and prepare its financial statements in accordance with those standards.

FASAB issued Statement of Federal Financial Accounting Standards (SFFAS) Number 4, *Managerial Cost Accounting Concepts and Standards for the Federal Government*, on July 31, 1995. According to that statement, "...[r]eporting entities should report the full costs of outputs in general purpose financial reports. The full cost of an output produced by a responsibility segment is the sum of (1) the costs of resources consumed by the segment that directly or indirectly contribute to the output, and (2) the costs of identifiable supporting services provided by other responsibility segments within the reporting entity, and by other reporting entities."

Notwithstanding the guidance of SFFAS Number 4, cost information in NLS reports that we reviewed does not present all of the costs that pertain to the organization's work products. NLS identifies program costs in those reports; however, the costs that are identified are not NLS's full costs because they do not include dollar allocations for approximately \$14 million in compensation (i.e., salaries and benefits) for NLS's staff.

For example, NLS's *Network Bulletin 10-26, Budget, NLS*, dated October 15, 2010 lists the average dollar values of Talking Book Program items that NLS furnished to patrons in FY 2010. The bulletin instructs network libraries/MLAs, "You may use this information to determine NLS [sic] share of your program costs and the cumulative federal investment in your organization or state."

The bulletin included some NLS program cost data. However, the costs it presented were not the full costs of program items. For example, the bulletin indicated that the FY 2010 cost was \$156.38 for a DTBM, but that amount was only the contracted cost of the machine's hardware, and did not include NLS's costs for researching new technologies, contracting for the manufacture of machines, conducting quality control inspections, inventorying machines, or overhead.

The bulletin also indicated that the FY 2010 cost was \$12.80¹⁸ for a digital book in English, but that also was not the full cost amount for the item. Although the figure included amounts for a book's narration, digital cartridge, and shipping container, it did not include NLS's costs for selecting the book title, preparing the title's written narrative summary, producing NLS's *Talking Book Topics* publication (to identify the title's availability), performing quality assurance for the narration, or overhead.

Full cost information is critical to the Congress and Library officials for making decisions about allocating federal resources, authorizing and modifying programs, and evaluating program performance. Moreover, NLS needs full cost information to make meaningful managerial decisions regarding its operating economy and efficiency. Therefore, to provide clear and complete accountability for the federal funds it is provided, and to make more fully-informed assessments of its internal operations, NLS should begin applying SFFAS Number 4 as soon as practicable to reports it develops regarding program costs.

Recommendation

We recommend that NLS apply Statement of Federal Financial Accounting Standards Number 4, *Managerial Cost Accounting Concepts and Standards for the Federal Government* to internal and external reports it develops regarding the Talking Book Program's costs.

Management Response

Management concurred with our recommendation.

V. NLS Inventory Control is Adequate, But Issues Stemming From Present Non- Integrated Systems Must Be Resolved

NLS and the network regional libraries/MLAs have separate responsibilities for controlling the inventory of DTBMs. NLS is responsible for tracking and accounting for the DTBMs in its

¹⁸ Based on data as of September 20, 2010, and 965 copies produced consisting of \$7.17 for flash cartridges, \$3.70 for narration, \$1.01 for duplication (label, duplicate, package, ship), and \$0.92 for mailing containers.

custody and the ones it provides to the network libraries. The Network libraries/MLAs are responsible for tracking and accounting for all the DTBMs that NLS provides to them, including the ones they provide to individual patrons. Through testing we performed at network regional libraries in Maryland, Virginia, and Washington, DC, we confirmed that NLS was effectively tracking and accounting for the DTBMs it distributed to those regional libraries. Moreover, we confirmed that the three network libraries we visited had correctly recorded data (e.g., serial numbers, DTBM types, DTBM assignments to patrons, etc.) in their automated inventory systems on the machines NLS provided to them.

While on site at the three nearby network regional libraries, we also verified that those agencies had in their files a NLS application form (i.e., *National Library Service for the Blind and Physically Handicapped Application for Free Library Service: Individuals*) for each patron added to the program. Each form we reviewed included a certification by an appropriate authority (see footnote 6 for details).

A vulnerability presently exists in the control of DTBMs that network libraries assign to some patrons. Specifically, the systems that the 56 network libraries presently use to track the whereabouts of DTBMs are not integrated. Instead, a decentralized system (see Figure 8) reports to an antiquated system (CMLS/BPHICS).

NLS Regional Libraries/MLAs Automation Systems as of April 7, 2011			
Automated System	Abbreviation	# Used	Percent
Consortium of User Libraries	CUL	7	11.7
Keystone Library Automation Systems	KLAS	35	58.3
Reader Enrollment And Delivery System	READS	14	23.3
Other systems		4	6.7
Total		60*	100.0
*56 regional libraries plus four states that have two regional libraries.			
Figure 8: Various Automated Systems Used by the Regional Libraries/MLAs			

As a result, a regional library/MLA may lose track of a DTBM it assigned to a patron if the patron moves to another state and takes the assigned machine with him or her in the move.

At the time of our fieldwork, NLS was exploring options for implementing a new integrated system to help address shortcomings of the current decentralized systems. NLS hopes to have a replacement system in FY 2012 or early FY 2013.

While an inventory system should help, NLS is also dependent on the network libraries/MLAs inputting accurate inventory data. Recognizing the importance of inventory

control, NLS has requested that each MLA perform statistical testing of its DTBM inventory as part of its self-audit procedures.¹⁹ However, due to budget and resulting staff cutbacks, 31 of the 56 network regional libraries reported that they had not performed self-audits on a regular basis as recommended by NLS. As a result, NLS should consider testing regional libraries/MLAs' DTBM inventories during its periodic site visits²⁰ to ensure that all machines are being appropriately accounted for by the network libraries.

Recommendation

We recommend that NLS explore the cost-benefits of testing DTBM inventories as part of its periodic site visits to network regional libraries to ensure that the machines provided to the agencies are being appropriately accounted for.

Management Response

Management concurred with our recommendation.

¹⁹ The *NLS Machine-Lending Agency Inventory Procedures Manual*, among other things, includes detailed procedures for performing the self-audit. Each of the three MLAs we visited had a copy of this manual.

²⁰ NLS staff visit each MLA on a two-year cycle to determine if the MLA is following NLS guidance.

►► CONCLUSION

By taking timely action to modernize its talking book technology, NLS seized an excellent opportunity to save costs, improve efficiency, and provide its patrons higher quality service. Moreover, NLS will accrue more savings and provide even better patron service if it effectively implements and sustains its plans for the download centers to make its convenient BARD service more available.

Nevertheless, we are not as certain as NLS is about growth expectations for the NLS program. Although studies published by the National Federation of the Blind show that aging baby boomers will double the current number of blind or visually impaired Americans over the next 30 years, NLS's readership, like that for public libraries, has generally declined over the past 4 years. Furthermore, NLS's patrons have commercially-available alternatives to obtain information and books. Regardless of how predictions for the program actually unfold, it is clear that NLS faces genuine challenges in forecasting demand and determining appropriate production schedules to avoid over-production or short supplies of books and equipment.

Of more immediate concern are two issues involved with accountability for program assets. First, it is critically important for NLS to ensure that clear and complete accountability is provided for the federal funds that are annually appropriated for the NLS program, considering its size, scope, and expense. Total salaries and benefits of NLS's staff equate to \$30 in funds spent annually for each active reader. Accordingly, management needs to ensure that these personnel costs are elements of the full costs developed for NLS's outputs (products and services). Second, it is equally important for NLS to ensure that full accountability exists for the whereabouts of program DTBMs. Developing a new integrated system should help resolve the current shortcomings but NLS will still be dependent on the network libraries for accurate data.

Major Contributors to This Report:

Nicholas Christopher, Assistant Inspector General for Audits
Patrick Cunningham, Senior Lead Auditor
Sarah Sullivan, Management Analyst

▶▶ APPENDIX A: ACRONYMS USED IN THIS REPORT

BARD	Braille and Audio Reading Download
CMLS	Comprehensive Mailing List System
DTBM	Digital Talking Book Machines
FASAB	Federal Accounting Standards Advisory Board
FY	Fiscal Year
GAO	Government Accountability Office
LCPM	Library of Congress Project Management
LCR	Library of Congress Regulation
MLA	Machine Lending Agencies
MMR	Monthly Machine Report
NLS	National Library Service for the Blind and Physically Handicapped
PMI	Project Management Institute
SFFAS	Statement of Federal Financial Accounting Standards

▶▶ APPENDIX B: MANAGEMENT RESPONSE



LIBRARY OF CONGRESS

ASSOCIATE LIBRARIAN
FOR LIBRARY SERVICES
September 28, 2011

TO : Patrick Cunningham
Office of the Inspector General

FROM : Deanna B. Marcum *DM*
Associate Librarian for Library Services

SUBJECT : Library Services' Response to Draft Audit Report No. 2011-PA-104, "NLS Effectively Planned and Implemented the Digital Conversion, but Needs to Reduce its Requirements Projections."

I very much appreciated the wrap-up meeting of August 24, 2011, to discuss your findings of this audit, and as I told you then, both the director of the National Library Service for the Blind and Physically Handicapped and I believe that the report you have written is both thorough and fair. I am pleased to report that many of the changes you suggested in the report have already been completed or in process. We have, for example, reduced the number of Digital Talking Book Machines that will be ordered from the manufacturer, based on your recommendations.

The Braille and Audio Reading Download (BARD) program has proven to be extremely successful. We question your asserting that in the very near term, BARD will reduce costs for NLS, for two reasons: (1) the digital program is still being rolled out and there are short term costs that are still necessary; and (2) BARD is attracting patrons that are more computer savvy than our traditional patrons, some of whom were not using the program before, and use is increasing.

NLS realizes the importance of BARD and is currently enhancing the system to offer more services that respond to the needs of the blind community. The new systems architecture will be more modular, allowing for easier and less expensive upgrades in the future.

In order to close the loop on this audit, we are formally responding to each recommendation.

- I. **NLS's Project Planning and Processes Resulted in an Effective Digital Program.**
Recommendation:
None

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Response:
We concur, and we are pleased with your assessment of NLS's work.

II. NLS should Reduce its Estimate of DTMBs Needed

Recommendations

We recommend that NLS:

1. *Reevaluate its projections of DTBM requirements, giving consideration to our projections*

Response:
We concur, and we have already reduced the number of required machines

2. *Encourage all network MLAs to periodically review their patron records and remove inactive accounts*

Response:
We concur, and there is now in place an ongoing process with the network libraries.

III. NLS Needs to Reduce Production of Titles on Flash Cartridges to Reflect BARD Use

Recommendation:

We recommend that NLS promptly reduce its plans to duplicate 2 million book titles per year in FYs 2012 and 2013 by at least 15 percent per year.

Response:
We do not automatically produce 1,000 copies of 2,000 books. The libraries place orders for the titles they need. The contract is for "not more than an average of 1,000 copies." Because libraries order the books that they need, we only duplicate what is demanded. Working on a "pull" rather than "push" model, we do not over-produce the number of books.

IV. NLS Needs to Determine the Full Costs of its Products and Services to Better Inform the Congress and the States

Recommendation:

We recommend that NLS apply the Statement of Federal Financial Accounting Standards, Number 4, Managerial Cost Accounting Concepts and Standards for the Federal Government to internal and external reports it develops regarding the Talking Book Program's costs.

Response:
We concur, and we have already spoken with Office of the Chief Financial Officer for assistance with this project.

V. Inventory control is adequate, but Issues stemming from the present Non-Integrated Systems Must be Resolved

Recommendation:

We recommend that NLS explore the cost-benefits of testing DTBM inventories as part of its periodic site visits to MLAs to ensure that the machines provided to the agencies are being appropriately accounted for.

Response:

We concur.

Many of our legacy systems are old and stand-alone, and we do not have an efficient and integrated way to control our inventory. As you note, our tracking is effective, but it is cumbersome and almost impossible to get accurate numbers in a timely fashion.

New systems are being developed that will integrate all the data from the libraries including NLS. These systems will produce accurate, timely accounting and allow for a more accurate testing of MLAs inventories.

cc: Kathryn Mendenhall
Ruth Scovill