United States Government Accountability Office
Washington, DC 20548

June 12, 2007

The Honorable James H. Billington
Librarian of Congress

Subject: *Talking Books for the Blind*

Dear Dr. Billington,

The National Library Service for the Blind and Physically Handicapped (NLS), a part of the Library of Congress, operates a free national talking (audio) book program for qualified blind, visually impaired, or physically disabled residents of the United States and its territories, as well as qualified U.S. citizens residing abroad. NLS produces and distributes analog cassette players and talking books and periodicals recorded on audio cassettes to approximately 434,000 individual subscribers and 33,000 institutions through a network of 132 participating libraries and the U.S. Postal Service (USPS).

In the 1990s, NLS recognized that analog audio cassette technology was becoming outdated and nearing the end of its useful life and initiated efforts to plan for a new, digitally based talking book system. NLS analyzed three alternatives for the system—CD, hard drive, and flash based media—and chose to award a contract for the development of a digital talking book system based on flash memory media.[1] The development phase is now nearing completion, and NLS is planning to award the manufacturing contract for the digital talking book system in August 2007. Figure 1 shows the prototype of the standard digital talking book player, the NLS talking book flash memory cartridge, and the mailing container.

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[1] Flash memory is used in flash drives, which permit storage and transfer of data between computers.

Figure 1: Prototype of the NLS Talking Book Player System

Source: National Library Service.

Under U.S. copyright law, NLS is authorized to reproduce and distribute talking books without copyright infringement as long as they are produced in a specialized format exclusively for use by blind or other persons with disabilities.[2] The standard describing the specialized format for digital talking books is maintained by the Digital Audio-Based Information System (DAISY) consortium—an international organization established to develop specifications and tools for digital talking books—and accordingly is commonly known as the Daisy standard.[3]

The digital talking book project is a significant system development and acquisition investment. NLS estimates the 5-year (2007–2011) cost of the program, including the player and media acquisition, to be about $174 million. Over this same time period, NLS plans to continue the cassette-based talking book program, whose cost is estimated at about $44 million. The 5-year cost of the combined digital talking book and cassette programs is about $218 million.

The Chairman and Ranking Member of the House Committee on Appropriations asked us to review NLS planning and management of its digital talking book development and acquisition project. Specifically, our objectives were to determine to what extent NLS (1) performed sufficient analyses to select technologies for the

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[2] See 17 U.S.C. § 121.

[3] To protect copyrights, the Daisy standard addresses ways to encrypt and control access to the recorded content.

next generation of the talking book system and (2) effectively managed the development of the selected digital talking book technology and mode of distribution.

To address our first objective, we reviewed the program's legislative authority, as well as supporting copyright law;[4] reviewed relevant federal acquisition and system development guidance, including that of the Library of Congress; evaluated NLS's analysis of alternatives, life-cycle cost estimates and methodologies, cost to transition from the current to the new system, cost/benefit analyses, and other project management plans and procedures associated with the talking book program; reviewed and assessed NLS data used to develop the digital talking book player, media, duplication process, and distribution system; estimated the cost to USPS for delivery of talking book players and media; conducted interviews with officials from the Library of Congress's National Library Service for the Blind and Physically Handicapped and Information Technology Services, the program's contractors, USPS, the organization of Chief Officers of State Library Agencies, and the District of Columbia Public Library, as well as representatives from interest groups for blind and disabled persons; and conducted interviews with major organizations (eight foreign and two U.S.) that provide audio book services for the blind and reviewed their service structures and technologies.

To address our second objective, we evaluated NLS processes for requirements development, risk management, and quality assurance, as well as system progress reports, contractor deliverables, and other documentation associated with the talking book program in the light of guidance and industry standards; assessed the validity of technology test plans, protocols, and results; conducted interviews with library officials; and reviewed the 2006 assessment of the digital talking book program performed by the library's Office of the Inspector General. We performed our work at NLS offices, Library of Congress headquarters, USPS headquarters, the District of Columbia Public Library in Washington, D.C., and the contractor's headquarters in Columbus, Ohio, from September 2006 to February 2007 in accordance with generally accepted government auditing standards.

On March 8, 2007, we briefed the requesters' staff on the results of our study. In addition, we provided you with the briefing slides, which contain the detailed support for our recommendations. The purpose of this report is to summarize those results and transmit our recommendations to you.

In summary, NLS analyzed various alternatives for the digital talking book program starting in 2000, but the analyses did not have the rigor recommended by library

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[4] 2 U.S.C. §§ 135a–135b and 17 U.S.C. § 121, respectively.

guidance and government and industry best practices[5] to ensure that new assets are acquired through sound decision making. To its credit, NLS conducted market research and consulted with experts and stakeholders, including representatives from international organizations with similar programs, domestic groups representing people who are blind and physically disabled, and manufacturers. The agency identified and discussed numerous alternative technologies (including CD, flash memory, and miniature hard drives) and distribution mechanisms (such as Internet delivery via broadband channels and cable television channels). However, the agency's analysis of selected alternatives focused solely on the technology medium and the player and did not broadly consider the entire program and its underlying processes:

- NLS did not consider alternative ways to distribute players to the subscribers—such as direct shipment from the manufacturer to the patron—that could be less costly than the current process.
- NLS did not consider using commercial players designed specifically for people who are blind and physically disabled which include features such as tactile indicators and audio prompts and are compliant with the Daisy standard. For example, the agency had previously rejected commercial CD players based on its 2000 analysis, even though similar programs in other countries rely on such players to serve their subscribers. Figure 2 shows Victor Reader Classic[X], one of many commercial Daisy CD players used by blind and visually impaired talking book readers around the world. In addition, NLS did not consider using commercial services to distribute talking books to subscribers.

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[5] Office of Management and Budget (OMB), *Capital Planning Guide*, Version 2.0: Supplement to Office of Management and Budget Circular A-11, Part 7: Planning, Budgeting, and Acquisition of Capital Assets (Washington, D.C.: June 2006); P2C2 Group, Inc., *Federal Sector Report: Analyzing Alternatives for Federal Capital Investments* (Washington, D.C.: October 2003); Department of Defense, *Defense Acquisition Guidebook;* the Institute of Electrical and Electronic Engineers (IEEE), 1490-1998, *A Guide to the Project Management Body of Knowledge*, and 1362-1998 (New York, N.Y.: 1998), IEEE *Guide for Information Technology—System Definition—Concept of Operations Document* (New York, N.Y.: 1998); Library of Congress, Information Technology Services, *System Development Life Cycle Methodology*, Version 2.0 (May 2006) and *Project Management Handbook* (Washington, D.C.: November 2006).

Figure 2: Victor Reader Classic^X Commercial Daisy CD Talking Book Player from HumanWare

Source: HumanWare Canada, © 2007.

- NLS did not fully analyze the initial acquisition and life-cycle costs of each alternative—nor did it update its 2000 analysis of the CD and flash alternatives— as recommended by best practices. For example, the analysis stated that one-way mailing of CDs to subscribers—an approach that could significantly reduce the $40 million that NLS spends annually on mailing costs—would require highly automated equipment and technical staff to support it and concluded that few network libraries could provide such an environment. Because the analysis assumed that one-way mailing would continue to rely on network libraries for distribution (essentially mirroring the current distribution approach), NLS did not consider, for example, whether the use of commercial CD duplicating services or a centralized CD copying center that directly ships the media to the patron would be feasible.
- NLS did not provide documentation to support key technical conclusions, such as the advantages and disadvantages cited for each alternative. For example, its conclusion that repairs to CD and hard-drive-based players would be "relatively expensive for commercial repairers to perform" was not supported by technical studies or analysis.

Without a rigorous analysis of alternatives, NLS, the Congress, and the public will have limited assurance that the selected solution is the optimal one for delivering audio content to people who are blind and physically disabled, and NLS may be

missing an opportunity to select a solution that costs less and serves its subscribers better.

Furthermore, NLS developed several, but not all, of the acquisition plans and processes recommended by best practices. For example, the agency developed functional requirements, a program schedule, and testing plans. However, it did not develop a concept of operations describing how the talking book system is to operate; a project management plan including information on project organization, constraints, and assumptions; or a risk management plan identifying and prioritizing risks to the project. According to generally accepted business practices for acquiring and developing a system,[6] such plans and procedures can give NLS the guidance and framework necessary to execute, monitor, and control the talking book program in a way that meets the needs of its users and other stakeholders. Without complete plans and processes to guide the modernization, the agency faces risks to the project's cost, schedule, and performance.

The weaknesses in NLS's approach existed, in part, because NLS was not required to adhere to the Library of Congress's system development guidance, which would have provided a structure for performing an alternatives analysis and managing the project. Furthermore, the library's Chief Information Officer does not have the authority to provide oversight of the project.

To ensure that the best solution is selected and effectively delivered to talking book subscribers, we recommend that you require the Director of NLS to take the following two actions:

- Develop and document analyses of alternatives, including technologies and distribution options, before continuing further work on the talking book modernization project. At a minimum, these analyses should (1) identify and consider alternatives for all aspects of the talking book program, (2) consider the use of commercial products and services, (3) fully analyze the initial acquisition and life-cycle costs of each alternative, (4) provide support for key technical conclusions, and (5) be consistent with library guidance.
- Strengthen NLS's capabilities for modernizing the talking book program by developing a concept of operations and project management and risk management plans consistent with the library's guidance and industry best practices.

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[6] IEEE Std 12207.0-1996, *Standard for Information Technology—Software Life Cycle Processes* (New York, N.Y.: 1996); IEEE Std 12207.1-1997, *Standard for Information Technology—Software Life Cycle Processes—Life Cycle Data* (New York, N.Y.: 1997); IEEE Std 12207.2-1997, *Standard for Information Technology—Software Life Cycle Processes—Implementation Considerations* (New York, N.Y.: 1997); and IEEE Std 1362-1998, IEEE *Guide for Information Technology—System Definition—Concept of Operations Document* (New York, N.Y.: 1998); Department of Defense, *Defense Acquisition Guidebook*; Library of Congress, Information Technology Services, *System Development Life Cycle Methodology*; Version 2.0 (May 2006) and *Project Management Handbook* (Washington, D.C.: November 2006).

We also recommend that you require the Chief Information Officer to oversee these efforts and ensure that they are accomplished in accordance with library guidance.

<u>Agency Comments and Our Evaluation</u>

In written comments on a draft of this report, you concurred with our recommendations and described actions to address issues cited in the draft report, particularly in the areas of analyses of technologies and distribution options, NLS's capabilities for modernizing the talking book program, and oversight by the Chief Information Officer.

You also noted that the digital talking book program has been in the planning stage for nearly a decade and that the blind community has high expectations for its implementation. You stated that the analyses and planned actions we recommended to strengthen NLS acquisition management can be carried out concurrently with the current acquisition schedule for the talking book system and the library's fiscal year 2008 funding request.

We concur with the library's approach and agree that the necessary analyses and management actions to strengthen the digital talking book program could be performed concurrently with the tasks required for the initial delivery of the talking book system. These actions, if implemented as described, should ensure that NLS delivers a digital talking book solution that best serves the interests of both the program's patrons as well as taxpayers. Your written comments are reprinted in enclosure I.

We are sending copies of this report to the Chairmen and Ranking Minority Members of Senate and House committees that have authorization and oversight responsibilities for the Library of Congress. We will also make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at www.gao.gov.

Should you or your staff have any questions on matters contained in this report, please contact me at (202) 512-6240 or by e-mail at koontzl@gao.gov. Key contributions to this report were made by Mirko J. Dolak, Assistant Director; Nabajyoti Barkakati; Timothy E. Case; Barbara S. Collier; Heather A. Collins; Neil J. Doherty; Mustafa S. Hassan; John C. Martin; and Amos A. Tevelow.

Sincerely yours,

Linda D. Koontz
Director, Information Management Issues

THE LIBRARIAN OF CONGRESS

June 1, 2007

Dear Ms. Koontz:

Thank you for your letter of May 23 summarizing the results of GAO's study of the Library's acquisition of a digital talking book system. We appreciate the work and thought that went into your report.

I have discussed your recommendations with Dr. Deanna Marcum, Associate Librarian for Library Services, the senior Library official responsible for the National Library Service for the Blind and Physically Handicapped (NLS). The Library's response to the recommendations follows.

Require the Director of NLS to take the following actions:

• **Develop and document analyses including technologies and distribution options before continuing further work on the talking books modernization project. At a minimum, these analyses should (1) identify and consider alternatives for all aspects of the talking books program, (2) consider the use of commercial products and services, (3) fully analyze the initial acquisition and life-cycle costs of each alternative, (4) provide support for key technical conclusions, and (5) be consistent with Library guidance.**

The Library concurs. Dr. Marcum, after consultation with the Chief Information Officer and the Chief Operating Officer, has asked Ruth Scovill, the system designer for the Library's largest technology project to date (creation of the digital preservation system for the National Audiovisual Conservation Center) to work with NLS staff and contractors, as required, to develop the analyses called for in your report. Ms. Scovill will be on site at NLS for the next few months, and will report directly to Dr. Marcum.

NLS received the "Development of Life Cycle Cost Model for DTB's, Draft Report" from ManTech Advanced Systems International since the receipt of GAO's preliminary report, and we enclose it with this letter. It is only a partial response to your recommendation, as it sets forth the life cycle costs of the flash-technology-based program. We understand that the same kind of analysis needs to be carried out for other technological alternatives.

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- **Strengthen NLS's capabilities for modernizing the talking books program by developing a concept of operations and project management and risk management plans consistent with the Library's guidance and industry best practices.**

The Library concurs. NLS has agreed to develop formal concept of operations, project management, and risk management plans.

NLS currently uses a combination of industry-recognized tools and management procedures to effectively control the project's cost, schedule, and corresponding risks. *Microsoft Project* is used to compile, coordinate, and track tasks, time schedules, and costs for more than thirty sub-projects of the digital program. A combination of *Microsoft Project* and principles from the *Project Management Body of Knowledge Guide* is used to manage contractor tasks associated with the design and development of the DTB player, cartridge, and container. Project and cost changes are managed through a controlled NLS process that includes documenting change proposals and associated costs, obtaining approval from the Digital Audio Development Committee (the NLS management group for the project), and adjusting schedules, costs, and program budget for approved changes. The Library will direct Ms. Scovill to examine all of these procedures and to advise on how they can be improved.

- **We are also recommending that you require the Chief Information Officer to oversee these efforts and ensure that they are accomplished consistent with Library guidance.**

The Library concurs. The Digital Talking Books program will be reviewed by the Chief Information Officer. Dr. Marcum will ensure that the work of NLS is consistent with Library guidance.

As you are keenly aware, the blind community, in particular, is eagerly awaiting the transition from audiocassettes to digital technology for the talking book program. We shall continue to work closely with that community, along with all of the groups that represent the blind and physically handicapped communities, to develop a system that provides superior service, while remaining alert to cost/benefits analyses.

The Digital Talking Book program has been in the planning stage for nearly a decade, and the blind community has high expectations for its implementation. By making the analyses called for in the GAO report Ms. Scovill's highest priority, we expect to work quickly to resolve all of the outstanding issues. With four months remaining in the current fiscal year, we believe that the analyses can be done concurrently with the tasks promised for delivery in our FY 08 funding request.

        I shall make certain that any work done leading to implementation remains flexible enough to be modified by results of the additional analyses. We believe that the probable long-term solutions will be possible within the budget we have proposed for the Digital Talking Books program and that adjustments to the original plan can be accommodated. We are confident that the analyses need not unduly affect the timing of the overall program. But our goal is the same as GAO's: to make certain that government-provided services are of the highest quality to the user community at the least cost to the tax payers.

        Dr. Marcum will be pleased to follow up with any questions you have.

Sincerely,

James H. Billington
The Librarian of Congress

Enclosure

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