

**The Internal Revenue Service Has Appropriate
Processes to Accept Modernization Program
Software From Developers**

February 2005

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This report has cleared the Treasury Inspector General for Tax Administration disclosure review process and information determined to be restricted from public release has been redacted from this document.



DEPARTMENT OF THE TREASURY
WASHINGTON, D.C. 20220

INSPECTOR GENERAL
for TAX
ADMINISTRATION

February 15, 2005

MEMORANDUM FOR CHIEF INFORMATION OFFICER

Gordon C. Milbourn III

FROM: Gordon C. Milbourn III
Assistant Inspector General for Audit
(Small Business and Corporate Programs)

SUBJECT: Final Audit Report - The Internal Revenue Service Has
Appropriate Processes to Accept Modernization Program
Software From Developers (Audit # 200420041)

This report presents the results of our review of the delivery of contractor-developed source code material¹ for the Internal Revenue Service's (IRS) modernization programs. The overall objective of this review was to determine whether the IRS has access to the source code material necessary to operate and maintain its modernization programs. This review addresses concerns presented to the Treasury Inspector General for Tax Administration by IRS personnel during prior audits.

In summary, the IRS Modernization and Information Technology Services (MITS) organization has appropriate processes in place to accept modernization project source code material from developers. The software development task orders we reviewed and the PRIME² contract incorporate the Federal Acquisition Regulation (FAR),³ contract provisions, and escrow agreements designed to protect the IRS' interest in modernization source code material. The MITS organization has obtained or has access to source code material for modernization projects currently in operation. Procedures are also in place to ensure the timely delivery of source code material for

¹ Source code material means source code and source code listings, provided in computer-sensible form and on media capable of being used as input to a system for compilation; related documentation; and any commentary necessary for a software engineer to understand the source code, all indexed and organized by the contractor for ease of use.

² The PRIME contractor is the Computer Sciences Corporation, which heads an alliance of leading technology companies brought together to assist with the IRS' efforts to modernize its computer systems and related information technology.

³ 48 C.F.R. pt 1-53 (2002). The FAR is an organized publication of uniform policies and procedures used for acquisition by all Federal Government executive agencies.

current and future modernization project releases. In addition, the IRS' Development Integration and Test Environment (DITE)⁴ has access to modernization source code material controlled by the PRIME contractor.

Management's Response: The Chief Information Officer agreed with the audit finding and expressed appreciation that the audit confirmed the MITS organization has appropriate processes in place to accept modernization project source code material from developers. Management's complete response to the draft report is included as Appendix V.

Copies of this report are also being sent to the IRS managers affected by the report finding. Please contact me at (202) 622-6510 if you have questions or Margaret E. Begg, Assistant Inspector General for Audit (Information Systems Programs), at (202) 622-8510.

⁴ The DITE provides a software development facility to build modernization project applications and enables comprehensive integration and testing for multiple projects.

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Background

The Business Systems Modernization (BSM) program is a complex effort to modernize the Internal Revenue Service's (IRS) technology and related business processes. According to the IRS, this effort will involve integrating thousands of hardware and software components. It is estimated this effort will last up to 15 years and cost \$8 billion.

To facilitate the success of its modernization efforts, the IRS hired the Computer Sciences Corporation (CSC) as the PRIME contractor¹ and integrator for the BSM program and created the BSM Office (BSMO) to guide and oversee the work of the PRIME contractor. Additional contractors have been hired to supplement the design and development of modernization projects.

During the development of a system, programmers create the applications by writing programming statements and instructions. These statements and instructions are referred to as source code. Source code is what a programmer writes, but it is not directly executable by the computer. It must be converted into machine language, or object code, by compilers.² The object code file contains a sequence of instructions that the computer can understand, but that is difficult for a human to read or modify. For this reason, the source code is the most permanent form of the program. When operating system or application software is purchased or received, it is usually in the form of compiled object code and the source code is not included.

The PRIME contract specifies how the source code material³ is delivered to the IRS. Generally, software proposed for use and/or delivered in a sale of the software to more than one customer requires the use of an escrow

¹ The PRIME contractor heads an alliance of leading technology companies brought together to assist with the IRS' efforts to modernize its computer systems and related information technology.

² A compiler is a special program that processes statements written in a particular programming language and turns them into machine language or "code" that a computer's processor uses.

³ Source code material means source code and source code listings, provided in computer-sensible form and on media capable of being used as input to a system for compilation; related documentation; and any commentary necessary for a software engineer to understand the source code, all indexed and organized by the contractor for ease of use.

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agent.⁴ Commercial off-the-shelf (COTS) software with licensing agreements is a good example of this type of software. On the other hand, software that is delivered under a specific task order contract to one user, such as the IRS, requires delivery of the source code material after completion of the project's deployment.

Access to source code allows for error correction, modifications, and enhancements of the software. Further, source code access allows the customer to enhance software independently of the developer if the software developer goes out of business or is otherwise unable to meet its obligations.

This review was performed at the IRS Modernization and Information Technology Services (MITS) organization facilities in New Carrollton, Maryland, and the Enterprise Computing Center⁵ in Martinsburg, West Virginia, during the period September through December 2004. The audit was conducted in accordance with *Government Auditing Standards*. Detailed information on our audit objective, scope, and methodology is presented in Appendix I. Major contributors to the report are listed in Appendix II.

The Internal Revenue Service's Rights to Modernization Source Code Material Are Protected

The MITS organization has appropriate processes in place to accept modernization project source code material from developers. The software development task orders we reviewed (see Appendix I for specific task orders) and the PRIME contract incorporate the Federal Acquisition Regulation (FAR),⁶ contract provisions, and escrow agreements designed to protect the IRS' interest in modernization source code material. The MITS organization has obtained or has access to source code material for modernization projects currently in operation. Procedures are also in place to ensure the timely delivery of

⁴ The escrow agent will be responsible for the safekeeping of the source code and will release the source code to the end-customers if the conditions in the source code deposit agreement arise.

⁵ IRS Computing Centers support tax processing and information management through a data processing and telecommunications infrastructure.

⁶ 48 C.F.R. pt 1-53 (2002). The FAR is an organized publication of uniform policies and procedures used for acquisition by all Federal Government executive agencies.

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source code material for current and future modernization project releases. In addition, the IRS' Development Integration and Test Environment (DITE)⁷ has access to modernization source code material controlled by the PRIME contractor.

Software development task orders and the PRIME contract incorporate the FAR provisions and escrow agreements designed to protect the IRS' interest in modernization source code material

Representatives from the IRS and the CSC signed the PRIME contract in December 1998. The PRIME contract provides the legal framework for modernizing IRS computer systems. This contract incorporates FAR provisions for guidance in the acquisition of products and services.

For example, FAR Clause 52.227-14, Rights in Data, is included in the PRIME contract and entitles the IRS to unlimited rights to "data" first produced in the performance of the contract. Computer programs, including source code material, qualify as "data" under the PRIME contract. Thus, when software is delivered to the IRS, the PRIME contract directs the software developer to turn over all associated source code material. This clause covers software produced by the PRIME contractor and delivered exclusively to the IRS.

For software that is used by more than one customer, such as COTS software with licensing agreements, the PRIME contract requires the use of an escrow agreement. A source code escrow agreement allows the IRS to obtain access to the software's source code material under certain circumstances, such as if the PRIME contractor goes out of business or fails to make required modifications to the software.

⁷ The DITE provides a software development facility to build modernization project applications and enables comprehensive integration and testing for multiple projects.

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Finally, the PRIME contract contains FAR termination provisions⁸ that are designed to protect the IRS. The termination provisions require the software developer to deliver or put into escrow all completed or partially completed source code material.

Similarly, modernization projects using software developers other than the PRIME contractor either incorporate FAR provisions for guidance in the acquisition of products and services or include specific instruction for migrating the source code to the IRS. See Appendix IV for a list of FAR provisions applicable to ownership of source code material.

The MITS organization has obtained or has access to source code material for modernization projects currently in operation

The IRS Product Assurance organization tests software developed for the IRS' operations. The Source Code and Documentation Control (SCDC) Branch is part of the Product Assurance organization. The SCDC Branch provides independent source code control of the IRS' critical systems. The SCDC Branch's control responsibilities include more than 100 current software applications.

A function of the SCDC Branch is to perform the role of gatekeeper for all IRS source code material. As the gatekeeper, the SCDC Branch allows only successfully tested software to operate on the IRS' computer systems. We verified the SCDC Branch, in performing its role of gatekeeper, successfully obtained source code material for the following modernization projects:

- The Customer Communications Project (CCP) – The CCP reduces call waiting time for taxpayers and reduces the number of abandoned telephone calls.
- The Internet Refund Fact of Filing (IRFOF) – The IRFOF project provides instant refund status

⁸ FAR 52.249-2, Termination for Convenience of the Government (Fixed-Price); FAR 52.249-6, Termination for Convenience or Default (Cost-Reimbursement); FAR 52.249-8, Default (Fixed-Price Supply and Service).

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information for resolving refund problems to taxpayers over the Internet.

- The Internet Employer Identification Number (IEIN) – The IEIN project allows small business to apply for and receive Employer Identification Numbers over the Internet.
- The Custodial Accounting Project (CAP) – The CAP provides an integrated link between tax administration financial information and administrative financial information.
- The Modernized e-File (MeF) – The MeF project provides electronic filing for large corporations and tax exempt organizations.

Procedures are in place to ensure the timely delivery of source code material for current and future modernization project releases

In August 2003, the SCDC Branch developed its Transition to Support Guide for projects residing on the modernized infrastructure. This Guide focuses on projects currently supported by modernization contractors with plans to transition to the IRS. As contractor-developed projects begin transitioning to the IRS, the SCDC Branch assumes responsibility for all document control activities previously performed by the contractors.

The SCDC Branch Transition to Support Guide is an evolving document and, as such, is subject to change. As the IRS further defines and develops its transition activities, the SCDC Branch will review and update the Guide to ensure it accurately describes these changes. The SCDC Branch will release new versions of the Guide as necessary.

The DITE has access to modernization source code material controlled by the PRIME contractor

The DITE is composed of a Virtual Development Environment and an Enterprise Integration and Test Environment. The DITE provides a software development facility to build modernization project applications. It also enables comprehensive integration and testing for multiple modernization projects.

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Source code material for modernization projects under development, with the exception of the CAP⁹ (which is maintained by the SCDC Branch), is located within the DITE. The DITE maintains only PRIME contractor-developed source code material. Modernization project examples include:

- The Customer Account Data Engine (CADE) – The CADE is an online modernized data infrastructure that will house the IRS' taxpayer account and return data for more than 200 million individual and business taxpayers.
- e-Services – The e-Services project is a BSMO project focused on revolutionizing the way taxpayers transact and communicate with the IRS. This web-based project will expand the existing third-party tools and data collection processes.
- The Integrated Financial System (IFS) – The IFS is a management tool that will help the IRS better budget, plan, track, report, and manage its finances. It is designed to input, track, and report financial data.
- The Security Technology Infrastructure Release (STIR) – The STIR project is a customer-focused technical infrastructure for secure telephony and electronic interaction among employees, tax practitioners, and taxpayers.

While modernization source code material may be controlled by the PRIME contractor, it is readily accessible by the DITE system administrators performing their daily duties.

Management's Response: The Chief Information Officer agreed with the audit finding and expressed appreciation that the audit confirmed the MITS organization has appropriate processes in place to accept modernization project source code material from developers.

⁹ The CAP is being developed by Northrop Grumman outside of the PRIME contract.

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Appendix I

Detailed Objective, Scope, and Methodology

The overall objective of this review was to determine whether the Internal Revenue (IRS) has access to the source code material¹ necessary to operate and maintain its modernization programs. To accomplish this objective, we:

- I. Determined the applicable Federal Acquisition Regulation (FAR)² clauses regarding the delivery of source code material to customers and assessed the impact to the IRS with the current modernization project contract provisions, including the PRIME³ contract provisions.
- II. Identified previous “lessons learned” experiences in obtaining source code material from contractors and vendors for IRS systems and applications within the Modernization and Information Technology Services (MITS) organization.
- III. Determined the current procedures used by the MITS organization to obtain source code material.
- IV. Determined whether modernization project task orders and other associated modernization contracts included sufficient detail requiring the contractors to deliver the source code material to the IRS. We also obtained documentation verifying the IRS’ control and access to source code material.
 - A. Reviewed project task orders and documentation verifying the IRS’ control and access to source code material relating to the following modernization projects.
 1. The Customer Communications Project (CCP) – The CCP reduces call waiting time for taxpayers and reduces the number of abandoned telephone calls.
 2. The Internet Refund Fact of Filing (IRFOF) – The IRFOF project provides instant refund status information for resolving refund problems to taxpayers over the Internet.

¹ Source code material means source code and source code listings, provided in computer-sensible form and on media capable of being used as input to a system for compilation; related documentation; and any commentary necessary for a software engineer to understand the source code, all indexed and organized by the contractor for ease of use.

² 48 C.F.R. pt 1-53 (2002). The FAR is an organized publication of uniform policies and procedures used for acquisition by all Federal Government executive agencies.

³ The PRIME contractor is the Computer Sciences Corporation, which heads an alliance of leading technology companies brought together to assist with the IRS’ efforts to modernize its computer systems and related information technology.

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3. The Custodial Accounting Project (CAP) – The CAP provides an integrated link between tax administration financial information and administrative financial information.
 4. The Customer Account Data Engine (CADE) – The CADE is an online modernized data infrastructure that will house the IRS' taxpayer account and return data for more than 200 million individual and business taxpayers.
 5. e-Services – The e-Services project is a Business Systems Modernization Office project focused on revolutionizing the way taxpayers transact and communicate with the IRS. This web-based project will expand the existing third-party tools and data collection processes.
 6. The Integrated Financial System (IFS) – The IFS is a management tool that will help the IRS better budget, plan, track, report, and manage its finances. It is designed to input, track, and report financial data.
- B. Reviewed the following associated Modernization program task orders requiring escrow agreements for commercial off-the-shelf software.
1. SAP⁴ and RWD Technologies⁵ enterprise software licenses and maintenance.
 2. Vignette⁶ internet management enterprise software license and maintenance.
 3. PeopleSoft⁷ enterprise software license and maintenance.
 4. Sapiens⁸ Business Rules Authoring Environment and Assisted and Automated Sequencing tools for the CADE.

⁴ SAP is an interenterprise software company and independent software supplier.

⁵ RWD Technologies is a corporation that provides an integrated approach to business solutions in areas including performance solutions, enterprise systems, and applied technology solutions.

⁶ Vignette is a corporation that provides comprehensive applications to give customers the ability to deliver enterprise web applications consisting of integrated information, composite applications, and business processes to effectively meet business objectives.

⁷ PeopleSoft is a provider of enterprise application software. PeopleSoft applications are built to enable integration with third-party applications and legacy systems.

⁸ Sapiens is a company which is adapting its rules language, eMerge, a technical rules syntax that is modeled after actual business rules commonly employed in the business world. This enables developers to concentrate solely on specifying standard logic while the rules-based engine automatically infers the nonstandard criteria.

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Appendix II

Major Contributors to This Report

Margaret E. Begg, Assistant Inspector General for Audit (Information Systems Programs)
Gary Hinkle, Director
Edward A. Neuwirth, Audit Manager
Bruce Polidori, Senior Auditor
Louis Zullo, Senior Auditor
Steve Gibson, Auditor

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Appendix III

Report Distribution List

Commissioner C
Office of the Commissioner – Attn: Chief of Staff C
Deputy Commissioner for Operations Support OS
Associate Chief Information Officer, Business Systems Modernization OS:CIO:B
Associate Chief Information Officer, Information Technology Services OS:CIO:I
Deputy Associate Chief Information Officer, Business Integration OS:CIO:B:BI
Deputy Associate Chief Information Officer, Program Management OS:CIO:B:PM
Deputy Associate Chief Information Officer, Systems Integration OS:CIO:B:SI
Director, Procurement OS:A:P
Director, Stakeholder Management Division OS:CIO:SM
Director, Business Systems Development OS:CIO:I:B
Chief Counsel CC
National Taxpayer Advocate TA
Director, Office of Legislative Affairs CL:LA
Director, Office of Program Evaluation and Risk Analysis RAS:O
Office of Management Controls OS:CFO:AR:M
Audit Liaisons:
 Associate Chief Information Officer, Business Systems Modernization OS:CIO:B
 Director, Business Systems Development OS:CIO:I:B
 Manager, Program Oversight Office OS:CIO:SM:PO

**Selected Federal Acquisition Regulation Clauses
Related to Source Code Material Ownership**

Federal Acquisition Regulation (FAR)¹ 52.227-14, Rights in Data – This regulation provides the Federal Government shall have unlimited rights in data first produced in the performance of a contract. These rights also include data delivered under this contract that constitute manuals or instructional and training material for computer installation, operation, or routine maintenance and repair of items, components, or processes delivered or furnished for use under the contract.

FAR 52.249-2, Termination for Convenience of the Government (Fixed-Price) – This regulation states the Federal Government may terminate performance of work under the contract in whole or, from time to time, in part if the contracting officer determines a termination is in the Federal Government’s interest. The contracting officer shall terminate by delivering to the contractor a Notice of Termination specifying the extent of termination and the effective date. After receipt of a Notice of Termination, and except as directed by the contracting officer, the contractor shall immediately transfer title and deliver to the Federal Government the completed or partially completed plans, drawings, information, and other property that, if the contract had been completed, would be required to be furnished to the Federal Government.

FAR 52.249-6, Termination for Convenience or Default (Cost-Reimbursement) – This regulation is similar to FAR 52.249-2, except these provisions pertain to Cost-Reimbursement contracts and apply in cases of Termination for Convenience or Termination for Default. The Federal Government may terminate performance of work under the contract in whole or in part if (1) the contracting officer determines a termination is in the Federal Government’s interest [convenience] or (2) the contractor fails to make progress in the work so as to endanger performance [default].

FAR 52.249-8, Default (Fixed-Price Supply and Service) – This regulation states that if the contract is terminated for default, the Federal Government may require the contractor to transfer title and deliver to the Federal Government, as directed by the contracting officer, (1) completed supplies and (2) partially completed supplies and materials, parts, tools, dies, jigs, fixtures, plans, drawings, information, and contract rights (collectively referred to as “manufacturing materials” in this clause) that the contractor has specifically produced or acquired for the terminated portion of this contract. Upon direction of the contracting officer, the contractor shall also protect and preserve property in its possession in which the Federal Government has an interest.

¹ 48 C.F.R. pt 1-53 (2002).

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Appendix V

Management's Response to the Draft Report



CHIEF INFORMATION OFFICER

DEPARTMENT OF THE TREASURY
INTERNAL REVENUE SERVICE
WASHINGTON, D.C. 20224

February 7, 2005

RECEIVED
FEB - 7 2005

MEMORANDUM FOR ASSISTANT INSPECTOR GENERAL FOR AUDIT
(SMALL BUSINESS AND CORPORATE PROGRAMS)

FROM: W. Todd Grams *WTS*
Chief Information Officer

SUBJECT: Draft Audit Report – The Internal Revenue Service Has
Appropriate Processes to Accept Modernization Program
Software from Developers (Audit #200420041)

Thank you for the opportunity to review the referenced draft audit report. We are pleased the subject audit confirmed that the IRS Modernization and Information Technology Services (MITS) organization has appropriate processes in place to accept modernization project source code material from developers.

This is emphasized in your report, with the acknowledgement that:

- Our Software Development Task Orders and the PRIME contract incorporate the Federal Acquisition Regulation (FAR), contract provisions, and escrow agreements designed to protect the IRS' interest in modernization source code material.
- The MITS organization has obtained or has access to source code material for modernization projects that are currently in operation.
- We have procedures in place to ensure the timely delivery of source code material for current and future modernization project releases.
- The IRS Development Integration and Test Environment has access to modernization source code material controlled by the PRIME contractor.

We agree with your audit findings and appreciate your affirmation that we have processes and policies in place to control the delivery and maintenance of source code while in development as well as production.

We appreciate your continued support and the valuable assistance and guidance from your staff. If you have questions, please contact me at (202) 622-6800, or Richard Spiers, Associate Chief Information Officer, Business Systems Modernization, at (202) 622-7458.