

**The Internal Revenue Service
Can Improve Management Controls Over
the Year 2000 End-to-End Systems
Integration Test**

November 1999

Reference Number: 2000-20-008

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.



INSPECTOR GENERAL
for TAX
ADMINISTRATION

DEPARTMENT OF THE TREASURY
WASHINGTON, D.C. 20220

November 4, 1999

MEMORANDUM FOR COMMISSIONER ROSSOTTI

FROM: Pamela J. Gardiner
Deputy Inspector General for Audit

SUBJECT: Final Audit Report – The Internal Revenue Service Can Improve
Management Controls Over the Year 2000 End-to-End Systems
Integration Test

This report presents the results of our review of the Year 2000 End-to-End (E2E) systems integration testing effort. The objective of this review was to assess the Internal Revenue Service's (IRS) planning efforts for the E2E System Integration Test II and Test III, and the execution of Test II.

In summary, we found that oversight control for the Year 2000 E2E Systems Integration Test could be improved through quality checks of contractors' deliverables to assure they meet their intended objectives. Additionally, configuration management controls over the E2E Systems Integration Test platform should be improved to facilitate a smooth transition from the testing environment to production in December 1999.

We previously reported these issues in a memorandum dated March 8, 1999. The IRS management agreed to the recommendations presented. Management's comments have been incorporated into the report where appropriate, and the full text of their comments is included as an appendix.

Copies of this report are also being sent to the IRS managers who are affected by the report recommendations. Please contact me at (202) 622-6510 if you have questions, or your staff may call Scott E. Wilson, Associate Inspector General for Audit (Information Systems Programs), at (202) 622-8510.

**The Internal Revenue Service Can Improve Management Controls Over
the Year 2000 End-to-End Systems Integration Test**

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Executive Summary

The primary goal of the Internal Revenue Service's (IRS) End-to-End (E2E) Systems Integration Test is to demonstrate that tax processing systems will perform correctly on or after January 1, 2000. The E2E test environment, herein referred to as "testbed," replicates the IRS' environment for processing tax returns, and for providing on-line access to taxpayer accounts, electronic tax filing, and the supporting hardware and telecommunications infrastructure. The Year 2000 E2E Systems Integration Test is being controlled by the IRS' Information Systems Product Assurance function, with significant levels of contractor support. Planning for the E2E Systems Integration Test began in May 1998, and testing will run through December 1999.

The E2E test consists of three segments.¹ The overall objective of this review was to assess the IRS' planning efforts for the E2E System Integration Test II and Test III, and the execution of Test II. Another audit is currently underway to assess the execution of Test III.

Results

During our monitoring of the Test II execution and Test III planning, we found that the Product Assurance test team and the contractors supporting the IRS' E2E testing effort were working diligently to reduce problems with the testbed and to coordinate the work of a large numbers of resources in various sites to deliver the testing effort. However, we identified the following issues, which need management's attention:

Product Assurance Should Perform Quality Checks of the Contractors' Deliverables to Assure They Meet the Internal Revenue Service's Intended Objectives

The IRS is heavily dependent on contractor support for successful completion of its E2E testing efforts. Since the IRS has a relatively low number of employees assigned to the E2E effort in relation to the number of contractors, the IRS has found it difficult to review the large number of contractor deliverables. In addition, the fast-paced schedule

¹ The E2E System Integration Test is separated into the following three phases:

Test I - Using 1998 System Acceptability Testing (SAT) data, the test ensured that the IRS' systems software components, application components, and Commercial-off-the-Shelf products worked through the year 2000. This test used a limited set of dates from the year 2000.

Test II - Using copies of live taxpayer data, this test ensured that tax processing systems performed correctly through the year 2000. This test used a limited set of dates from the year 2000.

Test III - Using controlled data with pre-determined test results, the test will ensure that tax processing applications, including 2000 Filing Season applications, will perform correctly during and after the year 2000. This test will use a full range of dates from the year 2000 and beyond.

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of the E2E Systems Integration Test has contributed to the difficulty in timely reviewing and analyzing all contractor products.

Without regular quality reviews of contractor deliverables, the IRS cannot be assured that information provided by the contractor is useful and advances the goals of the E2E test.

Configuration Management Controls Over the Year 2000 End-to-End Systems Integration Test Should Be Improved

One objective of configuration management is to account for all information technology components and provide a basis for sound change management.² However, no single organization in the IRS has control over the configuration management of the E2E Systems Integration Test testbed. Portions of the E2E testbed have not been inventoried and only fragmented efforts for documenting the testbed were identified. Our requests for inventory information on the E2E testbed revealed two of the four sites used for the E2E Systems Integration Test were not inventoried. Without a complete and accurate inventory of the hardware and software to be included in the E2E test, the IRS cannot be assured a smooth transition from the testing environment to production before January 1, 2000.

Summary of Recommendations

We recommended that:

- Product Assurance management provide for a quality review of all contractor deliverables and assure the work completed by those contractors is consistent with the objectives of the E2E Systems Integration Test.
- IRS management assign responsibility for configuration management of the E2E testbed to one controlling organization.
- Product Assurance ensure a complete inventory of the entire E2E testbed be completed prior to the completion of additional tests.

We initially reported these findings and recommendations in a memorandum dated March 8, 1999.

² According to the Information Systems Audit and Control Foundation's Control Objectives for Information and Related Technology (COBIT), configuration management satisfies the business requirement to account for all information technology components, prevent unauthorized alterations, verify physical existence and provide a basis for sound change management. This requirement is enabled by controls which identify and record all information technology assets and their physical location and a regular verification program which confirms their existence and takes into consideration configuration change management and unauthorized software checking.

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Management's Response: IRS management agreed to better monitor the activities of the contractors. Management also will ensure the testbed for Test III is baselined prior to the start of the next test and will determine the means by which it can ensure the likeness of the testbed and the production environment. On September 30, 1999, Information Systems informed us verbally and through electronic mail that the IRS has met its dates, as indicated in the management response, except for one item that addresses the issue of implementing procedures for ensuring the likeness of the E2E testbeds and the production environment. The original memorandum and management's complete response are included as Appendices IV and V, respectively.

The Internal Revenue Service Can Improve Management Controls Over the Year 2000 End-to-End Systems Integration Test

Objective and Scope

This report presents the results of our on-line review of the Internal Revenue Service's (IRS) Year 2000 End-to-End (E2E) System Integration Test. The objective of this review was to assess the IRS' planning efforts for the E2E System Integration Test II and Test III, and the execution of Test II.

We observed the planning and execution of Test II and the planning of Test III.

Planning for this review started in November 1998 and fieldwork was completed in May 1999. As part of this review, we observed the execution of Test II, which was a limited testing of approximately 69 tax processing systems in an integrated environment. Test II was conducted in two segments, the first of which started October 19, 1998, and ended December 18, 1998. The second segment started on January 18, 1999, and ended on April 27, 1999. We also reviewed planning efforts for Test III during which 94 systems will be tested to ensure that data processed through the IRS' tax processing systems perform correctly on and after January 1, 2000. Test III will be conducted from February 1, 1999, through December 17, 1999, with the testing of the year 2000 production programs commencing in October 1999.

We conducted this review within the office of the Chief Information Officer. Audit tests and observations were conducted at the Martinsburg Computing Center (MCC), the Tennessee Computing Center (TCC) and the Integration, Test and Control Center (ITCC) in New Carrollton, Maryland. The audit was performed in accordance with *Government Auditing Standards*.

Details of our audit objective, scope, and methodology are presented in Appendix I. Major contributors to this report are listed in Appendix II.

Background

The IRS' Year 2000 E2E Systems Integration Test is being controlled by the Information Systems Product

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Assurance function, with significant levels of contractor support. The primary goal of the Year 2000 E2E Systems Integration Test is to create a testbed that replicates the IRS' tax processing environment, including the processing of tax returns, providing on-line access to taxpayer accounts, electronic tax filing, and the supporting hardware and telecommunications infrastructure. Planning for the E2E Systems Integration Test began in May 1998, and testing will run to December 1999. The test is ultimately intended to prove that tax processing applications will perform correctly on or after January 1, 2000.

Results

During our monitoring of the Test II execution and Test III planning, we found that the Product Assurance test team, the contractors supporting the IRS' E2E testing efforts, and the Century Date Change (CDC) Project Office were working diligently to reduce problems with the testbed and to coordinate large numbers of resources in various sites to deliver the testing effort. However, we identified the following issues that needed to be addressed:

- Product Assurance should perform quality checks of the contractors' deliverables to assure they meet their intended objectives.
- Configuration management¹ controls should be instituted to facilitate transition from the E2E Systems Integration Testbed to production in December 1999.

We initially reported these findings and recommendations in a memorandum dated March 8, 1999. The original memorandum is included as Appendix IV. The IRS

¹ According to the Information Systems Audit and Control Foundation's Control Objectives for Information and Related Technology (COBIT), configuration management satisfies the business requirement to account for all information technology components, prevent unauthorized alterations, verify physical existence and provide a basis for sound change management. This requirement is enabled by controls which identify and record all information technology assets and their physical location and a regular verification program which confirms their existence and takes into consideration configuration change management and unauthorized software checking.

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provided a written response on April 12, 1999. The response is included as Appendix V.

Product Assurance Should Perform Quality Checks of the Contractors' Deliverables to Assure They Meet the Internal Revenue Service's Intended Objectives

The two sources of information we received on the E2E testbed were not consistent.

The monitoring and maintenance of the E2E Systems Integration Test testbed are integral to the successful completion of the E2E test and subsequent transition of the testbed components to production late in 1999. The hardware and software tested in the E2E testbed will establish the baseline configuration that will be used in production for the 2000 filing season.

The IRS is heavily dependent on contractor support for successful completion of its E2E testing efforts. Contractor developed inventory deliverables for the E2E Systems Integration Test testbed were not consistent. In requesting documentation of the E2E testbed inventory of equipment and software, we received two sets of information from different contractor sources. Our review of these sources showed they did not match.

The contractor was not aware of the differences. After we identified the discrepancies, the contractor initiated an effort to resolve and/or justify differences and to develop one finalized inventory for use by Product Assurance.

In addition, the contractor had oversight responsibility for certifying the baseline of hardware and software that constitute the testbed for E2E Test II. After the completion of the first segment of Test II, IRS officials were sent packages containing inventory items for which they were responsible. The responsible IRS officials were required to certify these packages and then return them to the contractor. This effort was not completed prior to the start of Test II, since the IRS has a relatively low number of employees assigned to the E2E effort in relation to the number of contractors, making it difficult to review the large number of contractor deliverables. In

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A contributing factor hindering quality reviews is the relative few IRS employees in relation to the number of contractor personnel.

addition, the fast-paced schedule of the E2E Systems Integration Test has contributed to the difficulty in timely reviewing and analyzing all contractor products.

In addition, regular quality reviews help ensure that the IRS is obtaining useful products from its contractors. Without the quality reviews, IRS management cannot be assured that the information provided by the contractors is useful and pertinent and advances the goals of the project.

Recommendation

1. Product Assurance management should provide for a quality review of all contractor deliverables and assure the work completed by those contractors is consistent with the objectives of the E2E Systems Integration Test.

Management's Response: Product Assurance management has taken action by appointing a team of IRS employees to monitor the activities of the contractors. Tasks performed by the contractors are monitored via multiple weekly and biweekly meetings. In addition, the E2E Test Program Manager personally reviews each deliverable before acceptance.

Configuration Management Controls Over the Year 2000 End-to-End Systems Integration Test Platform Should Be Improved

Configuration management identifies baselines of a development or maintenance effort and controls changes to those baselines.

Configuration management is an important component of any testing, development, or production system. The objective of configuration management is to identify the components (baselines) of a development or maintenance effort and to control changes to those baselines to ensure traceability throughout the usable life of the system. The first step in configuration management activities is identification and documentation. This step establishes a baseline from which changes to the configuration are managed or controlled.

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A strong configuration management process, as part of the E2E Systems Integration effort, will make identification of problems with the vast hardware and software platforms easier. Also, a baselined, documented and controlled testbed will be needed for the transition from the testbed to production in December 1999.

No one organization has configuration management responsibility for the E2E testbed.

One objective of configuration management is to account for all information technology components and provide a basis for sound change management. No single organization in the IRS has control over the configuration management of the E2E Systems Integration Test testbed. Portions of the E2E testbed have not been inventoried and only fragmented efforts for documenting the testbed were identified.

Requests for inventory information on the E2E testbed revealed two of the four sites used for the E2E Systems Integration Test were not inventoried. The testing facilities in Oxon Hill, Maryland, and the ITCC in the New Carrollton Federal Building were not inventoried at the time of our review. Contractor personnel explained that these sites had lower priority and, at the time, their inventory efforts were focused on the larger portions of the testbed in the MCC and the TCC.

Various factors have contributed to the absence of centralized configuration management of the E2E testbed. Initially, TRW, Inc. (the Integration Support Contractor) was tasked with configuration management of the E2E testing effort. This responsibility was eliminated from TRW's responsibility early in the E2E testing effort. No single organization within the IRS has assumed responsibility for this activity. Our efforts to identify a configuration management control point yielded multiple organizations assuming various levels of responsibility, and using multiple configuration management tools.

Without a complete and accurate inventory of the hardware and software to be included in the E2E test, there can be no assurance that all systems will perform adequately after January 1, 2000.

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Recommendations

2. IRS management should assign responsibility for configuration management of the E2E testbed to one controlling organization. This organization should adhere to prescribed configuration management criteria and document and control all hardware and software used as part of the E2E testing effort.

Management's Response: IRS management agreed to have the CDC Project Office assess the ability of the IRS to ensure that the hardware and software residing on the E2E testbed are, in fact, the same hardware and software that will be implemented in the production environment. At the completion of the assessment, if the CDC Project Office has been able to determine a means by which it can ensure the likeness of the testbeds and the production environment, then the first iteration of the test will occur. Otherwise, they will recommend and implement an alternative strategy to minimize the risk.

3. IRS management should ensure a complete inventory of the entire E2E testbed is completed prior to the completion of additional tests.

Management's Response: IRS management agreed to ensure a complete inventory of the entire E2E testbed is completed prior to any additional tests.

Conclusion

During our monitoring of the Test II execution and Test III planning, we found that the Product Assurance test team and its contractor support were working diligently to reduce problems with the testbed and to coordinate large numbers of resources in various sites to deliver the testing effort. However, contractor developed inventory deliverables for the E2E Systems Integration Test testbed were not consistent. In addition, no single organization has control over the configuration management of the E2E Systems Integration Test testbed.

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the Year 2000 End-to-End Systems Integration Test**

We originally reported these issues in a memorandum dated March 8, 1999. Management provided a response on April 12, 1999. Information Systems informed us verbally and through electronic mail that the IRS has met its dates as indicated in the management response except for one item, Action #2B, which addresses the issue of implementing procedures for ensuring the likeness of the E2E testbeds and the production environment. We have not evaluated the implementation of the corrective actions provided in the management response as part of this audit.

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Appendix I

Detailed Objective, Scope, and Methodology

The overall objective of this review was to assess the Internal Revenue Service's (IRS) planning efforts for the End-to-End (E2E) System Integration Test II and Test III, and the execution of Test II.

- I. Through interviews of necessary officials (i.e., Product Assurance, Year 2000 Telecommunications Project Office, Office of Technical Support, TRW, Inc., etc.) and review of relevant documentation, we determined if the E2E System Integration Test is being sufficiently planned and coordinated. Specifically, we:
 - A. Determined the purpose of and assessed the value added by the E2E System Integration Test metrics established by the Century Date Change (CDC) Project Office.
 - B. Assessed the status of configuration management efforts for the E2E System Integration Test by:
 1. Obtaining an update on the Product Assurance Integrated Test and Control Center's (ITCC) efforts to establish the Tier II configuration management process.
 2. Determining the status of the Unisys configuration management tool (SQA) in relation to the E2E System Integration Test (i.e., has the tool been procured, implemented, tested, or utilized for the E2E System Integration Test?).
 3. Reviewing the planned use of Endeavor for the IBM mainframe environment to determine if the product will be used to control both systems software and applications.
 - C. Monitored E2E System Integration Test status meetings to obtain testing information and to monitor the communication channel between testing partners by:
 1. Monitoring status meetings conducted by TRW.
 2. Monitoring status meetings conducted by Product Assurance.
 3. Monitoring status meetings conducted by the CDC Project Office.
- II. We evaluated the establishment of the test platforms to determine if the parallel processing environment can effectively run tests. Specifically, we:

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- A. Assessed the progress made in establishing and testing the telecommunication links between the test sites.
 - B. Determined how delays in establishing the IRS' Year 2000 compliant minicomputer (Tier II) platforms will affect the establishment of the Tier II testing platforms at the ITCC.
 - C. Assessed the impact on testing resources (i.e., test platform capacity, staffing for testing, etc.) in adding systems to the E2E System Integration Test.
 - D. Assessed the status of the Unisys 4800 testbed for the Tennessee Computing Center (TCC). This machine was initially scheduled for delivery at the TCC in the fall of 1998, but was delayed until the winter of 1999.
- III. We observed Test II activities at the Martinsburg Computing Center, the TCC, and the ITCC and reviewed results to determine if the test provides the assurance that its system software, applications, telecommunications, and Commercial-off-the-Shelf products operate correctly in the year 2000. Specifically, we:
- A. Determined if problems identified during testing are adequately tracked and resolved.
 - B. Assessed the level of communication and interaction between testing partners.
 - C. Determined if the E2E System Integration Test team is executing all the planned test runs.

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Appendix II

Major Contributors to This Report

Scott Wilson, Associate Inspector General for Audit (Information Systems Programs)

Michael Phillips, Acting Director

Kent Sagara, Acting Deputy Director

Vincent Dell'Orto, Audit Manager

Anthony Knox, Senior Auditor

Kim Hyatt, Auditor

Melvin Lindsey, Auditor

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Appendix III

Report Distribution List

Deputy Commissioner Operations C:DO
Deputy Commissioner Modernization C:DM
Chief Information Officer IS
Deputy Chief Information Officer (Systems) IS
Deputy Chief Information Officer (Operations) IS
Assistant Commissioner (Product Assurance) IS:PA
Assistant Commissioner (Program Evaluation and Risk Analysis) M:OP
Century Date Change Program Director IS:CD
Office of the Chief Counsel CC
Office of Information Resources Management IS:IR
Office of Management Controls M:CFO:A:M
National Director for Legislative Affairs CL:LA
Audit Liaison, Office of Program Oversight IS:IR:O

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Appendix IV

Memorandum #1 – Review of the Internal Revenue Service’s Year 2000
End-to-End Systems Integration Testing Effort – Test II Planning/Execution
and Test III Planning



DEPARTMENT OF THE TREASURY
WASHINGTON, D.C. 20220

March 8, 1999

Response Date:
March 22, 1999

MEMORANDUM FOR THE CHIEF INFORMATION OFFICER

FROM: Maurice S. Moody /s/ Maurice S. Moody
Acting Assistant Inspector General for Audit

SUBJECT: Review of the Internal Revenue Service’s Year 2000 End-to-End
Systems Integration Testing Effort – Test II Planning/Execution
and Test III Planning (#980095) – Memorandum #1

The Inspector General for Tax Administration is performing an on-line review of the Internal Revenue Service’s (IRS) Year 2000 End-to-End (E2E) Systems Integration Test effort. During our review, we determined that configuration management and control over the E2E testbed configuration need to be strengthened to ensure a smooth transition of hardware and software from the testing environment to production late in 1999. The audit work supporting this issue was conducted in accordance with generally accepted government auditing standards.

We believe the 10 workday response date for this memorandum is necessary because of the time criticality of the Century Date Change issue. Please call me at (202) 622-8500 if you have any questions or your staff may contact Michael Phillips, Acting Director, Office of Audit Projects, at (703) 812-1600.

Results

The Service’s Year 2000 E2E Systems Integration Test is being controlled by the Information Systems Product Assurance function, with significant levels of contractor support. The primary goal of the Year 2000 E2E Systems Integration Test is to create an off-line test environment that replicates the IRS’ tax processing environment, including the tax processing pipeline, tax processing support systems, electronic tax filing, and the supporting hardware and telecommunications infrastructure. Planning for the E2E Systems Integration Test began in May 1998, and testing will run to

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December 1999. The test is ultimately intended to prove that tax processing applications will perform correctly on or after January 1, 2000.

As part of this review, we observed the execution of Test II, which was a limited testing of approximately 69 tax processing pipeline systems in an integrated environment. Test II was conducted in two segments, the first of which started October 19, 1998 and ended December 18, 1998. The second segment started January 18, 1999. We also reviewed planning efforts for Test III where 94 systems will be tested to ensure that data processed through the tax processing applications perform correctly on and after January 1, 2000. Test III will be conducted from February 1, 1999 through December 17, 1999.

During our monitoring of the Test II execution and Test III planning, we found that the Product Assurance test team and their contractor support were working diligently to mitigate problems with the testbed and to coordinate large numbers of resources in various sites to deliver the testing effort. However, we have identified the following issues that need to be addressed:

- Product Assurance should perform quality checks of the contractors' deliverables to assure they meet their intended objectives.
- Configuration management controls should be instituted to facilitate transition from the E2E Systems Integration Test environment to production in December 1999.

Product Assurance should perform quality checks of the contractors' deliverables to assure they meet their intended objectives.

Contractor developed inventory deliverables for the E2E Systems Integration Test testbed were not consistent. In requesting documentation of the E2E testbed inventory of equipment and software, we received two sets of information from different contractor sources. Our review of these sources showed they did not match.

The two sources of information we received on the E2E testbed were not consistent.

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The contractor was not aware of the differences. After we identified the discrepancies, the contractor initiated an effort to resolve and/or justify differences and to develop one finalized inventory for use by Product Assurance.

In addition, the contractor had oversight responsibility for the baseline certification of the testbed for E2E Test II. After the completion of the first segment of Test II, IRS officials were sent packages containing inventory items for which they were responsible. These packages required certification by the responsible IRS official and a return to the contractor. This effort was not completed prior to the start of Test II and was not yet completed as of February 1999.

Since the IRS has a relative low number of employees assigned to the E2E effort in relation to the number of contractors, review of the significant amount of contractor deliverables has been difficult. In addition, the fast-paced schedule of the E2E Systems Integration Test has contributed to the difficulty in timely reviewing and analyzing all contractor products.

The monitoring and maintenance of the E2E Systems Integration Test testbed are integral to the successful completion of the E2E test and subsequent transition of the testbed components to production late in 1999. The hardware and software tested in the E2E test environment will establish the baseline configuration that will be used in production for the 2000 filing season.

In addition, regular quality reviews help ensure that the IRS is obtaining useful products from its contractors. Without the quality reviews, IRS management cannot be assured that the information provided by the contractors is useful and pertinent and advances the goals of the project.

A contributing factor hindering quality reviews is the relative few IRS employees in relation to the number of contractor personnel.

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Recommendation

1. Product Assurance management should provide for a quality review of all contractor deliverables and assure the work completed by those contractors is consistent with the objectives of the E2E Systems Integration Test.

Configuration management controls over the Year 2000 End-to-End Systems Integration Test platform should be improved.

No single organization has control over the configuration management of the E2E Systems Integration Test testbed. Portions of the E2E testbed have not been inventoried and only fragmented efforts for documenting the test environment were identified.

Requests for inventory information on the E2E testbed revealed two of the four sites used for the E2E Systems Integration Test were not inventoried. The testing facilities at the Salubria Building and the Integration, Test and Control Center in the New Carrollton Federal Building were not inventoried at the time of our review. Contractor personnel explained that these sites had lower priority and, at the time, their inventory efforts were focused on the larger portions of the testbed in the Martinsburg Computing Center and the Tennessee Computing Center.

Various factors have contributed to the absence of centralized configuration management of the E2E testbed. Initially, TRW, Inc. (the Integrated Support Contractor) was tasked with configuration management of the E2E testing effort. This responsibility was eliminated from TRW's responsibility early in the E2E testing effort. No single organization within the IRS has assumed responsibility for this activity. Efforts to identify a configuration management control point yielded multiple organizations, using multiple configuration management tools and assuming various levels of responsibility.

No one organization has configuration management responsibility for the E2E testbed.

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Configuration management identifies baselines of a development or maintenance effort and controls changes to those baselines.

Configuration management is an important component of any testing, development or production system. The objective of configuration management is to identify the components (baselines) of a development or maintenance effort and to control changes to those baselines to ensure traceability throughout the system life cycle. The first step in configuration management activities is identification and documentation. This step establishes a baseline from which changes to the configuration are managed or controlled.

A strong configuration management process, as part of the E2E Systems Integration effort, will make identification of problems with the vast hardware and software platforms easier. Also, a baselined, documented and controlled testbed will be needed for the transition from the test environment to production in December 1999.

Recommendation

2. IRS management should assign responsibility for configuration management of the E2E testbed to one controlling organization. This organization should adhere to prescribed configuration management criteria and document and control all hardware and software used as part of the E2E testing effort.
3. Product Assurance should ensure that a complete inventory of the entire E2E testbed is completed prior to the completion of additional tests.

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Appendix V

Management's Response to Memorandum #1

APR 12 1999

MEMORANDUM FOR TREASURY INSPECTOR GENERAL
FOR TAX ADMINISTRATION

FROM: David W. Junkins /s/ Dave Junkins
Director, Office of Information Resources Management IS:IR

SUBJECT: Revised Management Response to the Review of the Internal
Revenue Service's Year 2000 End-to-End Systems Integration
Testing Effort - Test II Planning/Execution and Test III Planning
(#980095) - Memorandum #1

At the request of the Year 2000 Program Director (IS:CD) and the Assistant
Commissioner for Product Assurance (IS:PA), we have revised corrective action #1A
from our March 22, 1999 management response, and are resubmitting our
management response in its entirety.

If you have any questions, please call me on (202) 283-4060 or have a member of your
staff call Donna Downing on (202) 283-4159.

Attachment

cc: Acting Director, Office of Audit Projects

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Attachment

Revised Management Response to the Review of the Internal Revenue Service's Year 2000 End-to-End Systems Integration Testing Effort - Test II Planning/Execution and Test III Planning (#980095) - Memorandum #1

Recommendation #1

Product Assurance management should provide for reviews of all deliverables produced by support contractors and ensure the work completed by those contractors is consistent with the objectives of the E2E Integration Test.

Assessment of Cause

During the Treasury Inspector General for Tax Administration's (TIGTA) review, auditors found inconsistencies of contractor-developed inventory deliverables for the End-to-End (E2E) Systems Integration testbed. Only after TIGTA's discovery of this were the inconsistencies resolved. In addition, baseline certification of the testbed for E2E Test II did not take place prior to the start of Test II. TIGTA attributed these problems to the relatively low number of IRS employees assigned to the E2E effort in relation to the number of contractors. As a result, review of the contractor deliverables has been difficult. The fast-paced schedule of the E2E Systems Integration Test has contributed to the difficulty in timely reviewing and analyzing all contractor products.

Corrective Actions #1A and #1B

- A. Product Assurance has appointed a team of IRS employees to monitor the activities of the Integration Support Contractor (ISC). Tasks performed by Integration Systems Contractor are monitored via the E2E Testing Office Weekly Program Meeting, the ISC Bi-Weekly Program Meeting, and the Product Assurance Risk Review Board Meetings, among others. In addition, the E2E Test Program Manager personally reviews each deliverable before acceptance.
- B. Product Assurance, along with its systems integration contractor, ISC, will ensure that the testbed for Test III will be baselined prior to the start of the next test. Memoranda to the appropriate IRS officials containing inventory items for which they were responsible have been sent. All systems will be verified by May 1, 1999, except for STRATUS. There is only one STRATUS system and it is needed in production. STRATUS will be turned over to the E2E Testing Office in May 1999.

The Internal Revenue Service Can Improve Management Controls Over the Year 2000 End-to-End Systems Integration Test

Attachment

Revised Management Response to the Review of the Internal Revenue Service's Year 2000 End-to-End Systems Integration Testing Effort - Test II Planning/Execution and Test III Planning (#980095) - Memorandum #1

Implementation Date for Corrective Action #1A

Completed: 03/03/1999
Product Assurance increased the monitoring of ISC deliverables.

Proposed: _____

Implementation Date for Corrective Action #1B

Completed: _____

Proposed: 05/01/1999
Test 3A testbeds, except for STRATUS, as noted above, will be baselined. Proposed date for STRATUS baselining is June 1, 1999.

Responsible Officials Corrective Actions #1A and #1B

Chief Information Officer IS
Deputy Chief Information Officer (Systems) IS
Assistant Commissioner, Product Assurance IS:PA

Corrective Action #1B Monitoring Plan

Responses to the baseline memoranda will be monitored via the Product Assurance's Critical Issue Tracking meetings held each Thursday. Any delay in responses will be reported to the Century Date Change (CDC) Risk Review Board.

ISC informal deliverables are reviewed and monitored by the E2E Test Program Office. IRS Technical Points of Contact (TPOCS) and the E2E Program Manager review each deliverable. Deliverables are monitored via the weekly program review meeting and ISC Bi-weekly program review meetings.

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Recommendation #2

Responsibility for configuration management of the E2E testbed should be assigned to one controlling organization. This organization will adhere to prescribed configuration management criteria and document and control all hardware and software used as part of the E2E testing effort.

Assessment of Cause

There is a need to confirm that the similar hardware and software are implemented in the production environment that are tested in the E2E testing environment.

Corrective Actions #2A and #2B

- A. The Century Date Change (CDC) Project Office will assess the ability of the Service to ensure that the hardware and software residing on the E2E test environment are, in fact, the same hardware and software that will be implemented in the production environment. The CDC Project Office will complete a feasibility assessment no later than June 1, 1999.
- B. At the completion of the assessment, if the CDC Project Office has been able to determine a means by which it can ensure the likeness of the testbeds and the production environment, then the first iteration of that test will occur by October 1, 1999. If the Service is not able to provide this assurance, it will recommend an alternative strategy to minimize the risk and implement that strategy by October 1, 1999.

Implementation Date for Corrective Action #2A

Completed: _____

Proposed: 06/01/1999

The CDC Project Office will assess the ability of the Service to ensure that the hardware and software residing on the E2E test environment are, in fact, the same hardware and software that will be

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implemented in the production environment.

Implementation Date for Corrective Action #2B

Completed: _____

Proposed: 10/01/1999

The CDC Project Office will implement procedures to ensure the likeness of the E2E testbeds and production environment. Otherwise, they will recommend and implement an alternative strategy to minimize the risk.

Responsible Officials for Corrective Actions #2A and #2B

Chief Information Officer IS
Deputy Chief Information Officer (Systems) IS
Director, Century Date Change Project Office IS:CD

Corrective Actions #2A and #2B Monitoring Plan

Once the feasibility of a method for ensuring the likeness of the testbeds and the production environment has been determined, the CDC Project Office will establish oversight monitoring and track the review process reporting on any anomalies and their resolution.

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Recommendation #3

Product Assurance should ensure that a complete inventory of the entire E2E testbed is completed prior to the completion of additional tests.

Assessment of Cause

During TIGTA's review, they found that portions of the E2E testbed had not been inventoried and only fragmented efforts for documenting the test environment were identified. Specifically, the testing facilities at the Salubria Building and the Integration, Test, and Control Center in the New Carrollton Federal Building were not inventoried at the time of TIGTA's review. Contractor personnel explained that these sites had lower priority and, at the time, their inventory efforts were focused on the larger portions of the testbed in the Martinsburg Computing Center and the Tennessee Computing Center.

Corrective Action #3

Performing the inventory establishes the baseline for the Test 3 environment. As noted in the answer to Recommendation #1, Product Assurance has already taken action to ensure that all E2E test facilities under Product Assurance control will be inventoried.

Implementation Date for Corrective Action #3

Completed: _____

Proposed: 05/01/1999

All E2E test facilities under Product Assurance's control will be inventoried.

Responsible Officials for Corrective Action #3

Chief Information Officer IS
Deputy Chief Information Officer (Systems) IS
Assistant Commissioner, Product Assurance IS:PA

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Attachment

Revised Management Response to the Review of the Internal Revenue Service's Year 2000 End-to-End Systems Integration Testing Effort - Test II Planning/Execution and Test III Planning (#980095) - Memorandum #1

Corrective Action #3 Monitoring Plan

The inventory establishes the baseline for the Test 3 test environment. The inventory is being monitored via the E2E Test Program Office Weekly program review, the ISC Bi-weekly program review and the Product Assurance Bi-weekly Risk Review Meeting. The inventory must be completed prior to the test readiness review, scheduled for May 1, 1999.