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DEPARTMENT OF THE TREASURY WASHINGTON, D.C. 20220

November 8, 1999

MEMORANDUM FOR COMMISSIONER ROSSOTTI

FROM: Pamela J. Gardiner

Deputy Inspector General for Audit

SUBJECT: Final Audit Report – The Internal Revenue Service May Not

Achieve Its 100 Percent Analysis and Validation Objectives for

Yamela Stardiner

Year 2000 Readiness

This report presents the results of our review of the Internal Revenue Service's (IRS) efforts to ensure that all converted application code and tax processing commercial off-the-shelf products are Year 2000 compliant.

In summary, we found that the IRS has taken actions to analyze all converted application code and to validate all tax processing commercial off-the-shelf products. However, due to Information Technology (IT) inventory inaccuracies and delays in the IRS providing information for the contractor-performed analysis and validation, the IRS may not fully achieve its 100 percent analysis and validation objectives for Year 2000 readiness. As a result, the IRS cannot assure that all critical programs have been identified, are Year 2000 compliant, and will function properly in the Year 2000.

As a result of this review, we recommended that IRS executive management ensure those organizations that have not certified their respective IT inventories do so immediately. In addition, management should ensure timely responses are provided to the contractor's requests for information and responses. Further, in the event that the 100 percent analysis and validation will not be completed, management should prioritize application code and commercial off-the-shelf products, to ensure critical applications are Year 2000 compliant.

IRS management agreed with our recommendations concerning the need for improvements in the corporate information technology inventory system and responsiveness to the contractor. They had reservations, though, concerning prioritizing application code and commercial off-the-shelf products since management

believes sufficient processes and resources are in place to complete the Year 2000 work. 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 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.

Attachments

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Executive Summary

The Year 2000 presents a significant challenge to the Internal Revenue Service's (IRS) operations. Most IRS computer systems employ a two-digit year format in date representations, rather than four digits. Unless the affected software and data files are corrected before January 1, 2000, serious problems may occur during tax processing.

In response to previous Treasury Inspector General for Tax Administration audit recommendations regarding the need for a review of converted application code to ensure Year 2000 (Y2K) compliance, the IRS contracted with Northrop Grumman Technical Services, Incorporated (Grumman). Specifically, Grumman was tasked to analyze 100 percent of the IRS' application code to ensure conversion efforts were successful and to validate the Y2K compliance of 100 percent of the IRS' tax processing commercial off-the-shelf (COTS) products with the manufacturer. Grumman's efforts contribute to lowering the risk that significant errors will go undetected.

The overall objectives of this review were to determine whether the IRS timely implemented corrective actions to previous audit recommendations related to Y2K compliance testing and to assess the effectiveness of the IRS' efforts to analyze and validate Y2K compliance of application code and tax processing COTS products.

Results

The IRS has made significant progress in implementing corrective actions to previous audit recommendations, related to Y2K compliance testing efforts, to ensure the IRS meets its Y2K readiness objectives. The IRS has also taken actions to analyze all converted application code and to validate all tax processing COTS products. However, due to Information Technology (IT) inventory inaccuracies and delays in the IRS providing information for the contractor-performed analysis and validation, the IRS may not fully achieve its 100 percent analysis and validation objectives for Y2K readiness. As a result, the IRS cannot assure that all critical programs have been identified, are Y2K compliant, and will function properly in the Year 2000.

The Internal Revenue Service Has Made Progress in Implementing Corrective Actions; However, Information Technology Inventory Certifications Remain Incomplete

Our review of 22 Y2K compliance testing-related corrective actions scheduled to be implemented by January 1, 1999, showed that 15 corrective actions were timely

implemented. Of the remaining seven corrective actions, five were either implemented late or had their estimated implementation dates extended. The risk of these five corrective actions on the IRS' Y2K objectives is minimal. However, the remaining two corrective actions, concerning the certification of the IRS' IT inventory, had not been implemented as of May 12, 1999. These two inventory certification corrective actions have a significant impact on Y2K implementation risk, since the IRS has based its processes for ensuring the timely analysis of all application code and validation of all tax processing COTS products on its IT inventory.

The 100 Percent Analysis of Application Code May Not Be Completed by the Year 2000

The IRS contracted with Grumman, in August 1998, to analyze all application code associated with the IRS' seven Y2K conversion phases. As of May 18, 1999, Grumman reported that it had analyzed over 30 million lines of code for phases¹ one through four and identified 8,864 potential errors. Of the potential errors, 7,245 have been explained without corrections needed, 1,456 were confirmed as errors, and 163 had not been responded to by the IRS.

Though Grumman has made significant progress to date, it may not meet its ultimate objective of a 100 percent analysis due to impediments and delays in receiving information and responses from the IRS. Phases one through four were originally scheduled to be completed by December 1, 1998. As of May 18, 1999, Grumman still had not completed the analysis of all the lines of application code in those phases due to the delays in receiving responses and all application code from the IRS. Although the remaining code to be analyzed for the first four phases is small, the IRS does not know which of those components could result in a Y2K processing error.

The IRS has taken actions, such as providing guidance and distributing memoranda to its staff on past-due items, which have improved the IRS' responsiveness to Grumman's requests. However, because phases one through four were five months past due as of the end of our audit work and similar delays are being experienced in the analysis of phase five application code, we are concerned that the IRS will be unable to achieve its objective of 100 percent analysis of application code by the Year 2000. By not achieving its objective, the IRS cannot assure that all critical programs have been identified, are Y2K compliant, and will function properly in the Year 2000.

A phase refers to the regular delivery period of the IRS, ending in January and July of each year, in which application code would be converted. Phase one began in July 1996 and ended in January 1997, phase two began in January 1997 and ended in July 1997, and so forth.

The 100 Percent Validation of Commercial Off-the Shelf Products May Not Be Completed by the Year 2000

The IRS has also contracted with Grumman to validate Y2K compliance of all tax processing COTS products with the manufacturer. Grumman began the validation process in the beginning of April 1999 and, as of May 19, 1999, had reviewed 2,864 of the approximately 11,300 identified products, which resulted in the identification of 999 potential errors. The majority of the potential errors were related to inaccuracies in the IRS' IT inventory.

Based on the numerous IT inventory errors which have to be corrected before the validation process can continue, we are concerned that problems similar to those experienced with code analysis will delay the process of validating the Y2K compliance of COTS products. As a result, the IRS may not achieve its objective of 100 percent validation of COTS products by the Year 2000.

By maintaining an IT inventory that is complete and accurate, the IRS can ensure that all application code is analyzed and all COTS products are validated, which reduces the risk that computer systems will not function properly in the Year 2000. Furthermore, by ensuring that all application code and COTS products are Y2K compliant, the IRS reduces the risk that taxpayers will be adversely burdened by system failures in the Year 2000. The proper functioning of the IRS systems will ensure that taxpayers receive quality service, including timely refunds, and the avoidance of erroneous notices.

Summary of Recommendations

To ensure that the 100 percent analysis of application code and validation of tax processing COTS products is completed timely, we recommend that IRS executive management ensure those organizations that have not certified their respective IT inventories do so immediately. In addition, management should ensure timely responses are provided to the contractor's requests for information and responses. Further, in the event that the 100 percent analysis and validation will not be completed, management should prioritize application code and COTS products, to ensure critical applications are Y2K compliant.

<u>Management's Response:</u> IRS management has initiated a four-fold approach to verification and certification of the IT inventory. This includes a physical wall to wall inventory certification, an independent audit and readiness verification, a contractor performed independent verification and validation, and the issuance of a memorandum instructing IRS executives to provide personal attention to outstanding Y2K issues.

Further, the Century Date Change (CDC) Project Office will report to the Chief Information Officer and the Commissioner weekly on open exception items, including completion of code review items. The CDC Project Office will also send a weekly report to the appropriate executives each week for any items that are overdue to the contractor performing the COTS validation. Since the review of applications code conversion work is nearly complete and all COTS products have been through an initial review, IRS management believes that any prioritization would not be beneficial. Management's complete response to the draft report is included as Appendix VI.

The overall objectives of this review were to determine whether the IRS timely implemented corrective actions to previous audit recommendations and to assess the effectiveness of the IRS' efforts for analyzing and validating the Y2K compliance of application code and tax processing COTS products.

Objectives and Scope

The overall objectives of this review were to determine whether the Internal Revenue Service (IRS) timely implemented corrective actions to previous Treasury Inspector General for Tax Administration audit recommendations related to Year 2000 (Y2K) compliance testing and to assess the effectiveness of the IRS' efforts to analyze and validate Y2K compliance of application code and tax processing commercial off-the-shelf (COTS) products. We reviewed Y2K testing-related corrective actions scheduled to be implemented between July 1, 1998, and January 1, 1999. We also reviewed the processes in place for the IRS' 100 percent code analysis and COTS validation to determine whether the processes would accomplish their intended objectives and whether they were progressing in a timely manner.

Audit work was performed at the IRS' National Office, Delaware/Maryland District Office, and Connecticut/Rhode Island District Office from January to June 1999. This audit was performed in accordance with *Government Auditing Standards*.

The detailed audit objectives, scope, and methodology of this review are presented in Appendix I. A listing of major contributors to this report is contained in Appendix II.

Background

The Year 2000 presents a significant challenge to IRS operations. Most IRS computer systems employ a two-digit year format in date representations, rather than four digits. Unless the affected software and data files are corrected before January 1, 2000, serious problems may occur during tax processing.

In response to previous audit recommendations regarding the need for a review of converted application code to ensure Y2K compliance, the IRS contracted with Northrop Grumman Technical Services, Incorporated (Grumman). Specifically, Grumman was tasked to analyze 100 percent of the IRS' application code to ensure conversion efforts were successful and to validate the Y2K compliance of 100 percent of IRS' tax processing COTS products with the manufacturer. Grumman's efforts contribute to lowering the risk that significant errors will go undetected.

Results

Due to IT inventory inaccuracies and delays in the IRS providing information for the contractor-performed analysis and validation, the IRS may not achieve its objectives for Y2K readiness.

The IRS has made significant progress in implementing corrective actions to previous audit recommendations to ensure the IRS meets its Y2K readiness objectives. The IRS has also taken actions to analyze all converted application code and to validate all tax processing COTS products. However, due to Information Technology (IT) inventory inaccuracies and delays in the IRS providing information for the contractor-performed analysis and validation, the IRS may not achieve its objectives for Y2K readiness.

The Internal Revenue Service Has Made Progress in Implementing Corrective Actions; However, Information Technology Inventory Certifications Remain Incomplete

Seven of 22 corrective actions were not completed by the estimated implementation date.

We reviewed 22 Y2K compliance testing-related corrective actions scheduled to be implemented between July 1, 1998, and January 1, 1999. Through discussions with personnel responsible for implementation and review of related documentation, we determined that 15 corrective actions were timely completed and consistent

with those recommended. Of the remaining seven corrective actions:

- Three were completed between three weeks to 5 1/2 months late.
- Two had their estimated completion date extended from January 1, 1999, to June 1, 1999.
- Two, with an estimated completion date of December 8, 1998 (changed from a prior estimate of September 30, 1998), were not completed as of May 12, 1999.

The three corrective actions completed late related to defining when PIC 9¹ standards for date fields apply, requiring formal support agreements for test activities, and ensuring project folders for phase three COTS products contain the required documentation. While these corrective actions were not completed by the estimated implementation date, we found no apparent impact on the IRS' Y2K readiness objective.

The two corrective actions for which the estimated completion dates were extended to June 1, 1999, called for the upgrading of guidelines in the Internal Revenue Manual. While we are concerned that the IRS missed the January 1, 1999, target date, we believe the impact of the delay is minimal, since the information is available to developers and testers in the "Developer's Testing Guidelines."

¹ PIC 9 stands for PICTURE 9 and is one of two primary Common Business Oriented Language data classes, which refers to the type of data to be stored in a field. The PICTURE character 9 is used to define a field as numeric.

Two corrective actions requiring certification of the entire INOMS inventory, scheduled to be completed by December 8, 1998, were not completed as of May 12, 1999.

The incomplete INOMS certifications may jeopardize IRS' objective of completing a 100 percent review of all application code and COTS products before January 1, 2000.

The two uncompleted corrective actions that were to be completed by December 8, 1998, required all 38 IRS organizations to certify the accuracy and completeness of their portion of the Integrated Network and Operations Management System (INOMS)² inventory. When the estimated completion date was not met, IRS' Information Systems function issued a memorandum that required a response by January 29, 1999. As of May 12, 1999, 5 of the 38 organizations had not submitted their certifications. The five organizations are the Tennessee Computing Center, Chief Operations Office, Midstates Region, Northeast Region, and the End-User Computing Support Division under the Assistant Commissioner Information Systems Field Operations.

The process for ensuring the timely analysis of all application code and validation of all tax processing COTS products is contingent on the accuracy and completeness of the INOMS inventory. When organizations do not timely certify that the INOMS is accurate and complete, there is the potential that some items may not be tested by the organization or subsequently analyzed and validated as Y2K compliant. As a result, the IRS' objective of completing a 100 percent analysis of application code and validation of COTS products before January 1, 2000, may be jeopardized.

Recommendation

1. IRS executive management should require the organizations that have not certified as to the accuracy and completeness of the INOMS inventory to do so immediately.

² INOMS is the IRS' Information Technology inventory system for all applications and COTS products.

Management's Response: IRS management has initiated a four-fold approach to verification and certification of the IT inventory. This includes a physical wall to wall inventory certification, an independent audit and readiness verification, a contractor performed independent verification and validation, and the issuance of a memorandum instructing IRS executives to provide personal attention to outstanding Y2K issues.

The 100 Percent Analysis of Application Code May Not Be Completed by the Year 2000

Due to impediments and delays in receiving information and responses caused by the IRS' process, Grumman has been unable to timely complete its analysis of application code.

The IRS contracted with Grumman to analyze all application code associated with the seven phases³ of the IRS' Y2K conversion efforts. Grumman's work, which we established to be consistent with the contract task order to analyze phases one through four, began on August 24, 1998. As of May 18, 1999, Grumman reported it had analyzed over 30 million lines of code and identified 8,864 potential errors. Of the potential errors, 7,245 have been explained without corrections needed, 1,456 were confirmed as errors, and 163 had not been responded to by the IRS. Despite the progress made, impediments and delays in receiving information and responses from the IRS resulted in Grumman being unable to complete the task by the original target date of December 1, 1998. As of May 18, 1999, Grumman had not completed its analysis of phases one through four.

One of the major problems encountered by Grumman was a delay in receiving system software components. For example, on December 16, 1998, Grumman reported that it was awaiting receipt of 6,044 components to

³ A phase refers to the regular delivery period of the IRS, ending in January and July of each year, in which application code would be converted. Phase one began in July 1996 and ended in January 1997, phase two began in January 1997 and ended in July 1997, and so forth.

complete phases one through four. As of May 18, 1999, Grumman reported that it had not received 28 components needed to complete its work, which is a significant reduction in outstanding components. However, by taking five months to accomplish this reduction, the IRS exhibited a lack of responsiveness in assisting the contractor in the timely completion of its objective.

The inaccuracy of the INOMS has caused Grumman to experience delays in completing its task.

Grumman has also experienced delays due to the inaccuracy of the INOMS inventory. Grumman compared the components obtained from the computer systems to the components listed in the INOMS and identified numerous components that were not included in the INOMS. As of January 5, 1999, Grumman reported that it had received 2,372 components that were not on the INOMS. Although this number was reduced to 12 components as of May 18, 1999, the numerous components not on the INOMS created additional work for Grumman, since it required Grumman to independently track the status of these components until they were added to the INOMS.

For additional examples of impediments and a schedule of delays in receiving information and responses encountered by Grumman, see Appendices IV and V, respectively.

Actions have been taken by the IRS to improve responsiveness.

The Information Systems Product Assurance Division's Certification Section has initiated various actions to resolve these issues. For example, the section provided guidance on:

- Sending components to Grumman for analysis.
- Completing the potential error listing document⁴.

⁴ The potential error listing is a spreadsheet prepared by Grumman that lists all potential errors identified through the code analysis. The IRS organizations are responsible for reviewing the errors and completing specific columns on the spreadsheet indicating whether they agree or disagree with the error.

• Re-sending components, in which errors were fixed, for analysis.

The Information Systems Century Date Change (CDC) Project Office also appointed a person to work with the organizations to resolve various INOMS issues. In addition, we were informed that when the Y2K Program Director started sending out issue alerts⁵ to the organizations, the organizations started inquiring on how to alleviate the situation. As a result of these efforts, which were initiated during the period of our audit, the organizations started resolving outstanding issues.

Some of the same delays encountered during the review of phases one through four are being experienced during the phase five analysis. Despite the steps being taken, we have observed that some of the same impediments and delays have been encountered in the analysis of phase five application code. Grumman began the review of phase five in January 1999 with an estimated completion date of March 15, 1999. Due to the continued impediments and delays, the estimated completion date was changed to May 28, 1999; however, this completion date was also not achieved. Grumman began the review of phase six in April 1999 and has yet to begin phase seven. If the impediments and delays continue, Grumman may be further hindered in the timely completion of its code analysis.

Due to continued delays and impediments caused by the IRS process, IRS may be unable to achieve the 100 percent application code analysis before January 1, 2000.

Grumman is capable of reviewing millions of lines of code per week; however, if the code is not available for review, required analysis cannot be completed. Based on the time expended to date on phases one through four, and the fact that similar delays caused by the IRS' process are being experienced in phase five, we believe the potential exists that the IRS may be unable to achieve the 100 percent analysis of all applications code by the year 2000.

⁵ An issue alert is a document sent to organizations containing a list of past due items that they are required to complete.

Recommendations

2. IRS executive management should improve its process for ensuring that Grumman receives information and responses that are critical to the successful performance and completion of its task.

Management's Response: The CDC Project Office is tracking code validation progress through numerous reports during the CDC Progress Report weekly meetings of IRS organizations. The CDC Project Office is tracking code validation progress during the CDC Progress Report weekly meetings of IRS organizations, through numerous reports. The closure of all open exception items, including completion of code review items, will be the subject of weekly reports to the Chief Information Officer and the Commissioner.

3. In the event that the 100 percent analysis will not be completed, IRS executive management should prioritize the application code to ensure that the most critical code is Y2K compliant.

Management's Response: The review of the applications code conversion work is nearly complete. At this point in the conversion process, trying to divide the last few percent of the application code into mission critical vs. non-mission critical items would not be beneficial. As a result, IRS intends to review all of the application code.

The 100 Percent Validation of Commercial Off-the-Shelf Products May Not Be Completed by the Year 2000

The IRS contracted with Grumman to conduct a validation of all tax processing COTS products that are listed in the INOMS inventory. Grumman was tasked with contacting manufacturers to identify the Y2K

compliance of product versions and to verify the information against the INOMS inventory.

The scope of Grumman's work, which we established to be consistent with the IRS' Y2K readiness objectives, includes all tier one, two, three⁶, and telecommunication COTS products that are designated in the INOMS product table⁷ as Y2K compliant or as having no Y2K compliance impact. Grumman's process involves verifying COTS at the product milestone level⁸ rather than the device level.⁹ Per the INOMS product table, there are approximately 11,300 COTS products to be validated by Grumman.

As of May 19, 1999, Grumman had reviewed 2,864 products and identified 999 potential errors, with the majority being INOMS errors.

Grumman began the validation of products on April 5, 1999, and, as of May 19, 1999, it had reviewed 2,864 products and identified 999 potential errors. Of the potential errors, 146 were Y2K compliance errors and 853 were errors related to inaccuracies with the INOMS inventory data. Because of the numerous INOMS errors which have to be corrected by the IRS

⁶ COTS devices are grouped into three tiers based generally on the hardware platform type. Tier one includes all mainframes, tier two includes mid-level systems, and tier three includes personal computers.

⁷ The INOMS product table is a component of the INOMS inventory that lists standard product names.

⁸ The product milestone level represents one record for each type of product. For example, the IRS may have 200 Toshiba laptops; however, there would be only one entry on the product milestone table for that product.

⁹ At the device level there is one record for each occurrence of a product. For example, if the IRS has 200 Toshiba laptops, at the device level there would be 200 records for Toshiba laptops, with the serial numbers being the identifying factor for each individual laptop.

A potential error is one in which Grumman believes a product contains an error. These include Y2K compliance errors and INOMS inventory errors. Potential errors are sent to the IRS owner for concurrence or explanation.

before the validation process can continue, problems similar to those experienced with the code analysis may prevent the completion of a 100 percent validation of COTS products before January 1, 2000. For example, during the review of application code, various organizations were slow in providing required information and responding to error lists submitted by Grumman, which delayed the process. Grumman stated in its COTS project plan that any delays in the IRS part of the process will affect completion times.

In addition, the incompleteness and inaccuracy of the INOMS inventory may affect the IRS' objective of 100 percent COTS validation, since Grumman relies on the INOMS as the basis for its validation. For instance, we identified a tier three product that was entered in the INOMS under a different product name, with the actual product being described in the comments section of the device record. This was done because the product table did not contain the actual product name. According to the Grumman project manager and the IRS Technical Point of Contact, Grumman does not review device records and, at the present time, it does not have a process to independently identify tier three products not listed on the INOMS. Therefore, the item would most likely not be identified and validated.

In another instance, Grumman identified that certain organizations are not using the INOMS to record telecommunications products. Since the products are not listed on the INOMS, Grumman will have no basis for selecting them for validation. If Grumman identifies the products through other means, it will have to classify them as inventory errors to which the responsible organization will have to respond before the validation process can continue. This activity could further delay Grumman's validation efforts.

Due to the inventory inaccuracies and potential delays, the IRS may not achieve its objective of 100 percent COTS validation.

We are concerned that Grumman's task of validating all COTS products may not be completed prior to the Year 2000 due to the numerous INOMS inventory inaccuracies already identified and the possibility that delays, similar to those experienced during the application code analysis, will occur. As a result, the IRS may not achieve its objective of 100 percent COTS validation.

Recommendations

4. IRS executive management should ensure the organizations that receive error lists understand the importance of timely responding so that Grumman can complete its task on a timely basis.

Management's Response: The CDC Project Office is tracking code validation progress through numerous reports during the CDC Progress Report weekly meetings. A report is sent to the appropriate executives each week for any items that are overdue to Grumman and the CDC Project Office continues to monitor these remaining items.

5. In the event that the 100 percent validation will not be completed, IRS executive management should prioritize the COTS products to ensure that the most critical COTS products are Y2K compliant.

Management's Response: COTS products are not always linked to systems and it cannot be determined if they are mission critical or non-mission critical. Therefore, the CDC Project Office set a goal to have all COTS products reviewed. As of August 25, 1999, all the COTS products have been through an initial review. In addition, the CDC Project Office has established a process to control and track the closure of all COTS related problems.

Conclusion

The IRS may not have complete assurance that all applications code and tax processing COTS products will function properly in the Year 2000. The IRS needs to ensure that Grumman receives the information required to perform its analysis and validation tasks on a timely basis. In addition, since Grumman uses the INOMS inventory as its basis for analysis of application code and validation of COTS products, INOMS needs to be accurate and complete to ensure the IRS can timely achieve its Y2K readiness objective of 100 percent analysis and validation.

Appendix I

Detailed Objectives, Scope, and Methodology

The overall objectives of this review were to determine whether the Internal Revenue Service (IRS) timely implemented corrective actions to previous audit recommendations related to Year 2000 (Y2K) compliance testing and to assess the effectiveness of the IRS' efforts to analyze and validate Y2K compliance of application code and tax processing commercial off-the-shelf (COTS) products. Specifically, we:

- I. Determined if the corrective actions related to testing efforts, scheduled to be completed by January 1, 1999, in response to recommendations from recent reviews, adequately met the requirements of the recommendations.
 - A. Identified the 22 corrective actions that were due to be implemented between July 1, 1998, and January 1, 1999.
 - B. Established the current status of the corrective actions through interviews of responsible personnel and review of documentation.
 - C. Through review of supporting documentation, determined whether completed corrective actions were fully consistent with those proposed or recommended.
 - D. For completed corrective actions not meeting their target dates, interviewed responsible officials to analyze the impact of late completion.
 - E. For corrective actions not completed, interviewed responsible officials to identify the reason for missed completion dates and to identify planned remedies to address them.
- II. Evaluated the process for ensuring that the contractor-performed 100 percent code review of Information System (IS) and non-IS developed applications is progressing as intended.
 - A. Determined whether the sub-tasks being performed by the contractor were consistent with the scope of the task order.

- B. Evaluated the effect that impediments encountered by the contractor had on the progress of the testing and the effectiveness with which they were addressed/remedied.
- C. Evaluated the effectiveness with which potential errors identified by the contractor were resolved by the IRS and the timeliness of the resolution process.
- D. Evaluated the process that was implemented to review the IRS' sensitive code and determined its effectiveness and ability to meet established completion times.
- III. Assessed the IRS' efforts to ensure that the Year 2000 compliance initiatives for tax processing COTS products were progressing as planned.
 - A. Visited the Delaware/Maryland and Connecticut/Rhode Island District Offices to gain an understanding of a typical office configuration and to determine whether all COTS products are accounted for on the INOMS.
 - B. Monitored the initial start-up phases of the 100 percent COTS validation project to determine whether the contractor's project plan met the Y2K readiness objectives of the IRS.
 - C. Evaluated the initial progress being made on the task by the contractor to identify potential impediments which would delay the completion of the task.

Appendix II

Major Contributors to This Report

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Appendix III

Report Distribution List

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Deputy Chief Information Officer, Operations IS:O

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Appendix IV

Impediments Encountered by Northrop Grumman Technical Services, Incorporated

Impediment	Cause of Impediment
Production names do not match Integrated	The application code owners did not ensure
Network and Operations Management System	that the production name of the component
(INOMS) names	matched what was recorded in the INOMS.
Procedures within a Procedure	The application code owners submitted a
	component to Grumman for analysis; however,
	numerous procedures that made up that
	component were listed individually on the
	INOMS. This delayed Grumman's process due
	to its initial inability to match the components
	received to those entered in the INOMS. The
	problem was due to the lack of a clear
	definition of a component.
Retired components listed in the INOMS	The application code owners retired a file in
	production; however, it was not marked retired
	in the INOMS. This delayed Grumman's
	analysis since it had to perform additional
	research or request information from the
	owners.
Bundled Systems	The application code owners submitted several
	components of a system to Grumman for
	analysis; however, there was only one
	component entered into the INOMS for the
	system. This delayed Grumman's process due
	to its initial inability to match the components
	received to those entered in the INOMS. The
	problem was due to the lack of a clear
	definition of a component.

Appendix V

Schedule of Delays in Receiving Information and Responses Phases one through four

As of Date Reported by	Outstanding Components to Complete Phases 1-4 (1)	Components Not in the INOMS (2)	Grumman Awaiting Response from
Grumman	•		Component Owner (3)
12/16/98	6,044	*	1,208
1/5/98	3,834	2,372	434
1/12/99	3,745	2,861	544
1/19/99	1,467	2,893	409
1/26/99	508	1,396	294
2/2/99	342	4,119	184
2/9/99	677	3,586	184
2/16/99	399	3,302	178
3/2/99	850	2,063	88
3/23/99	328	2,834	139
3/30/99	125	2,716	263
4/6/99	48	2,555	204
4/13/99	40	2,355	195
4/20/99	37	1,216	51
4/27/99	37	507	34
5/4/99	33	507	31
5/11/99	39	507	28
5/18/99	28	12	28

Phase five

As of Date Reported by	Outstanding Components to Complete Phase 5	Components Not in the INOMS	Grumman Awaiting Response from
Grumman			Component Owners
3/2/99	14,362	*	*
3/23/99	8,714	611	753
3/30/99	7,045	1,495	161
4/6/99	5,697	3,427	22
4/13/99	4,319	3,289	111
4/20/99	4,364	4,467	76
4/27/99	2,823	4,147	99
5/4/99	1,826	4,324	85
5/11/99	873	4,527	467
5/18/99	385	3,430	594

^{* -} No data

- (1) This column represents the outstanding components, which where initially due to Grumman and needed to perform its code analysis. The numbers in this column may increase due to components being added to the INOMS inventory.
- (2) This column represents the incompleteness of the INOMS inventory. These components were sent to Grumman for review; however, Grumman was unable to locate the component on the INOMS inventory. These components had to be independently tracked by Grumman until they were added to the INOMS inventory.
- (3) This column represents untimely responses to potential error listings. The organizations are required to respond within two weeks from the time the error listings are sent. The numbers in this column represent responses that have been outstanding for three or more weeks.

Appendix VI

Management's Response to the Draft Report



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

OFFICE OF TREASURY INSPECTOR GENERAL RECEIVED

October 22, 1999

1999 OCT 26 A 8: 12

FOR TAX ADMINISTRATION

MEMORANDUM FOR TREASURY INSPECTOR GENERAL FOR TAX ADMINISTRATION

FROM:

Charles O. Rossotti

Commissioner of Internal Revenue

SUBJECT:

Response to Draft Audit Report -- The Internal Revenue Service

May Not Achieve Its 100 Percent Analysis and Validation

Objectives for Year 2000 Readiness

Thank you for giving me the opportunity to review and comment on your draft report and recommendations concerning the possibility that the Internal Revenue Service may not achieve its 100 percent analysis and validation objectives for Year 2000 readiness dated September 7, 1999.

The Year 2000 (Y2K) Program at the IRS is a top priority for the agency as well as a personal priority for me. In your September draft report, you noted several aspects of the Y2K Program that can be improved. I share your concerns and am actively managing those concerns through my leadership of the Combined Program Management for Century Date Change and Filing Season Executive Steering Committee (ESC).

Specifically, you noted the need for IRS executive management to require its organizations to certify the accuracy and completeness of information used to manage the Y2K effort. Although IRS has made many efforts to improve the quality of the information in the corporate inventory system, we continue to have serious problems which we are addressing through the ESC. As a result, the Chief Information Officer now has responsibility for the accuracy of IRS' information technology inventory. More information about our efforts to improve the technology inventory is included in the attached response.

You also commented on the need for IRS organizations to support the contractor Northrop Grumman, in its efforts to perform a 100 percent review and analysis of all application code and Commercial Off The Shelf (COTS) products. I agree that IRS has a responsibility to provide Northrop Grumman with the information and responses to error lists that they need to complete their task. The IRS has numerous reports in place that track the application code and COTS products review process. In addition the issue has been raised at ESC meetings and brought to my attention in weekly reports. More information about our efforts to support Northrop Grumman is included in the attached response.

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In addition, you also recommend that IRS prioritize its application code and COTS products to ensure that we focus on the highest priority projects and complete all necessary work. As noted in the attached response, I feel we have sufficient processes and resources in place to complete our Y2K work. Prioritizing the few remaining projects, at this point, would not be the best use of our limited resources. Again, more detailed information is provided in the response.

If you have any questions, please call Paul Cosgrave, Chief Information Officer, at (202) 622-6800, or have a member of your staff call David Junkins, Director, Office of Information Resources Management, at (202) 283-4060, or Barry Herrmann, Chief, Office of IS Program Oversight, at (202) 283-7698, as appropriate.

Attachment

cc: Associate Inspector General, Information Systems Program

Attachment

Management Response to Draft Audit Report -The Internal Revenue Service May Not Achieve Its 100 Percent Analysis and Validation Objectives for Year 2000 Readiness

Recommendation #1

IRS executive management should require the organizations that have not certified as to the accuracy and completeness of the INOMS inventory do so immediately.

Assessment of Cause

Based on Century Date Change Project Office (CDC PO) analysis of the Integrated Network and Operations Management System (INOMS) data, as well as previous TIGTA findings, the CDC PO reported severe inventory problems to the Combined Management Program for the Century Date Change and Filing Season Executive Steering Committee (ESC), chaired by the Commissioner of the IRS.

Corrective Action #1 General Comments

In response to the report to the ESC, full responsibility for the accuracy of the inventory was moved to the Chief Information Officer (CIO). As a result of the change in responsibility, a four-fold approach to verification and certification of the inventory has been initiated.

Corrective Action #1A

Physical Wall to Wall Inventory Certification

The Telecommunications and Operations Division (IS:O:O) is conducting a physical wall to wall reconciliation and certification of the inventory at the service centers, the computing centers, call sites and at selected critical district offices and National Office sites. The wall to wall reconciliation of the inventory is scheduled to conclude in Mid-December 1999. This process will address all Commercial Off The Shelf (COTS) hardware and software and will ensure that all Treasury Communications Systems (TCS) equipment and software is accurately included in the inventory.

Three Step Process

- IS:O:O will conduct a wall to wall inventory certification and identify exceptions.
- IRS exceptions must be closed and certified within 30 days by the appropriate IS site executive.

Attachment

Management Response to Draft Audit Report -The Internal Revenue Service May Not Achieve Its 100 Percent Analysis and Validation Objectives for Year 2000 Readiness

> TCS exceptions must be closed and certified within 30 days by the appropriate Treasury executive.

Corrective Action #1B

Independent Audit and Readiness Verification

In July 1999, the CDC PO, in a joint effort with End-User Computing Support Division, instituted a series of Independent Audit and Readiness Verification (IARV) visits to selected sites. The IARV teams are assessing the INOMS accuracy and Tier 2, Tier 3, and Telecommunications Year 2000 (Y2k) readiness. The initial reviews have yielded over 400 problems and, the IARV reviews will be extended to additional sites. Corrective actions resulting from these IARV visits will be documented in a final report and will be tracked until completion.

Corrective Action #1C

Independent Verification and Validation

The CDC PO has contracted with Northrop Grumman (Grumman) to perform an Independent Verification and Validation (IV&V) of the application systems code and COTS products to ensure that they are Year 2000 (Y2k) compliant. The IV&V process validates information provided by the IRS organizations in conducting conversion and testing milestones. All INOMS discrepancies and other inventory problems identified by the IV&V process are assigned to the appropriate organization and are tracked until they are resolved.

Corrective Action #1D

100 Day Memorandum

The CIO, in a September 22, 1999 memorandum, "100 Days Remain Until the Year 2000," instructed IRS executives to provide personal attention to outstanding Y2k issues needing prompt resolution. A Year 2000 Alert Response Team (YART) was established and has initiated a campaign to resolve inventory and other Y2k issues rapidly. A YART team leader and a representative from each oversight organization within the Century Date Change Project have been appointed to help identify and quickly resolve issues that have been outstanding for a period of time or are being left unresolved due to a variety of organizational barriers.

Attachment

Management Response to Draft Audit Report -The Internal Revenue Service May Not Achieve Its 100 Percent Analysis and Validation Objectives for Year 2000 Readiness

Implementation Date of Corrective Action #1A

Completed: Proposed: January 1, 2000

The Telecommunications and Operations Division will complete the Wall to Wall Inventory Certification in accordance with the schedule from the

weekly Century Date Change

Information Systems Progress Report

(see attachment).

Implementation Date of Corrective Action #1B

Completed: Proposed: April 1, 2000

The CDC PO will complete the IARV review by October 31, 1999, and will track IARV findings to closure or until

March 31, 2000.

Implementation Date of Corrective Action #1C

Completed: Proposed: April 1, 2000

The CDC PO will complete the IV&V of COTS products and application code, and will track corrections until closure

or March 31, 2000.

Implementation Date of Corrective Action #1D

Completed:September 22, 1999

Proposed:

The CIO, in a September 22, 1999 memorandum, "100 Days Remain Until the Year 2000," instructed IRS executives to provide personal attention to outstanding Y2k issues needing prompt resolution

Responsible Official for Corrective Action #1A

Chief Information Officer IS
Deputy Chief Information Officer (Operations) IS
Director, Telecommunications and Operations Division IS:O:O

Attachment

Management Response to Draft Audit Report -The Internal Revenue Service May Not Achieve Its 100 Percent Analysis and Validation Objectives for Year 2000 Readiness

Responsible Official for Corrective Actions #1B,#1C and #1D

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

Corrective Action #1A Monitoring Plan

The CDC PO will monitor the progress of the certification process through reports at the weekly Century Date Change Information Systems Progress Report meetings.

Corrective Action #1B Monitoring Plan

The Century Date Change Project Office will continue to monitor the progress of the IARV findings at the weekly Century Date Change Information Systems Progress Report meetings.

Corrective Action #1C Monitoring Plan

The Century Date Change Project Office will continue to monitor the progress of the IV&V for COTS products and application code at the weekly Century Date Change Information Systems Progress Report meetings.

Corrective Action #1D Monitoring Plan

The Century Date Change Project Office will continue to monitor the progress of the resolving corrective actions by weekly tracking the trend of corrective actions.

Attachment

Management Response to Draft Audit Report -The Internal Revenue Service May Not Achieve Its 100 Percent Analysis and Validation Objectives for Year 2000 Readiness

Recommendation #2

IRS executive management should improve its process for ensuring that Grumman receives information and responses that are critical to the successful performance and completion of its task.

Assessment of Cause

The IRS contracted with Grumman to perform a 100 percent review and analyze all application code associated with the seven Y2k conversion phases. Grumman reported that they might be unable to complete the contract task on schedule due to impediments and delays in receiving information and responses from IRS organizations.

Corrective Action #2

The review is complete for about 95 percent of all code. However, the remainder is a serious concern. During the Century Date Change Progress Report weekly meetings of IRS organizations, the CDC PO is tracking code validation progress through numerous reports. The CDC Project Director raised this issue to the September 15, 1999, ESC. The closure of all open exception items, including completion of code review items, will be the subject of weekly reports to the CIO and Commissioner.

Implementation Date of Corrective Action #2

Completed: Proposed: November 1, 1999

Final reports from Grumman on the 100 percent code validation are due to the CDC PO on October 15, 1999.

Responsible Official for Corrective Action #2

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

Attachment

Management Response to Draft Audit Report -The Internal Revenue Service May Not Achieve Its 100 Percent Analysis and Validation Objectives for Year 2000 Readiness

Corrective Action #2 Monitoring Plan

Through the weekly Century Date Change Progress Report meetings attended by IRS organizations representatives, the Century Date Change Project Office will continue to monitor the progress of the application code validation process and the progress of all IRS organization responses to Grumman on any items that are due.

Attachment

Management Response to Draft Audit Report -The Internal Revenue Service May Not Achieve Its 100 Percent Analysis and Validation Objectives for Year 2000 Readiness

Recommendation #3

In the event that the 100 percent analysis will not be completed, IRS executive management should prioritize the application code to ensure that the most critical code is Y2k compliant.

Assessment of Cause

The CDC PO does not agree with the concept of prioritizing the small amount of remaining application code. The application code review is more than 95 percent complete. The CDC PO's plan is to concentrate on completing the remaining code reviews.

Corrective Action #3

The review of the applications code conversion work is nearly complete. At this point in the conversion process, trying to divide the last few percent of the application code into mission critical vs. non-mission critical items would not be beneficial. As a result, IRS intends to review all of the application code.

Implementation Date of Corrective Action #3

Completed: Proposed: November 1, 1999

Final reports from Grumman on the application code validation are due to the CDC PO on October 15, 1999.

Responsible Official for Corrective Action #3

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

Corrective Action #3 Monitoring Plan

The CDC PO is monitoring the progress of the code validation through weekly reports at the Century Date Change Progress Report meetings.

Attachment

Management Response to Draft Audit Report -The Internal Revenue Service May Not Achieve Its 100 Percent Analysis and Validation Objectives for Year 2000 Readiness

Recommendation #4

IRS executive management should ensure the organizations that receive error lists understand the importance of timely responding so that Grumman can complete its task on a timely basis.

Assessment of Cause

During the initial phase of the 100 percent application code review and analysis, there were inaccuracies and delays from the IRS organizations providing information to Grumman. It appeared that 100 percent of the application code might not be reviewed.

Corrective Action #4

During the Century Date Change Progress Report weekly meetings, the CDC PO is tracking code validation progress through numerous reports. A report is sent to the appropriate executives each week for any items that are overdue to Grumman and the CDC PO continues to monitor these remaining items. At the progress report meeting held September 13, 1999, the CDC PO emphasized that the problems related to the last remaining components must be resolved.

Implementation Date of Corrective Action #4

Completed:

Proposed: November 1, 1999
Final reports from Grumman on the 100 percent code validation are due to the CDC PO on October 15, 1999.

Responsible Official for Corrective Action #4

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

Attachment

Management Response to Draft Audit Report -The Internal Revenue Service May Not Achieve Its 100 Percent Analysis and Validation Objectives for Year 2000 Readiness

Through the weekly Century Date Change Progress Report meetings, attended by IRS organizations representatives, the Century Date Change Project Office will continue to monitor the progress of the COTS product validation process and the progress of IRS responses to Grumman on any items that are due. The CDC PO has asked for weekly updates on the closure of all issues.

Attachment

Management Response to Draft Audit Report -The Internal Revenue Service May Not Achieve Its 100 Percent Analysis and Validation Objectives for Year 2000 Readiness

Recommendation #5

In the event that the 100 percent validation will not be completed, IRS executive management should prioritize the COTS products to ensure that the most critical COTS products are Y2k compliant.

Assessment of Cause

Due to IT inventory inaccuracies and delays in the IRS organizations providing information to Grumman for their analysis and validation of COTS products, it appears that the IRS may not achieve its 100 percent analysis and validation objectives.

Corrective Action #5

COTS products are not always linked to systems and it cannot be determined if they are mission critical or non-mission critical. Therefore, the CDC PO set a goal to have all COTS products reviewed. As of August 25, 1999, all the COTS products have been through an initial review. In addition, the CDC PO has established a process to control and track the closure of all COTS related problems.

Implementation Date of Corrective Action #5

Completed:

Proposed: November 1, 1999
Final reports from Grumman on the COTS products validation are due to the CDC PO on October 15, 1999.

Responsible Official for Corrective Action #5

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

Corrective Action #5 Monitoring Plan

The CDC Project Office will continue to monitor the progress of the review of COTS products and the responsible organizations' resolution of all potential COTS problems. Exceptions are included in CDC PO Weekly Progress Reports and Exception Reports and are provided to the CIO and Commissioner.

Attachment

Century Date Change Information System Progress Report for Week Ending 09/17/1999

Wall-to-Wall/Reconciliation Inventory Status POC: Rhonda Noon (202) 283-5285 Date as of: 09/15/1999

Service Centers:

SITE	Expected Date Of Wall-to-Wall Certification (IS:O:O)	Wall-to-Wall Certification for ADP (IS:O:O)	Reconciliation Certification for ADP (30 days)	Wall-to-Wall Certification for TCS	Reconciliation Certification for TCS (30 days)	Issues	Status
Philadelphia Service Center	09/10/1999	09/10/1999	10/10/1999				Green
Fresno Service Center	09/17/1999		10/17/1999				Green
Memphis Service Center	06/1/1/60		10/17/1999				Green
Andover Service Center	6661/11/60		10/17/1999				Green
Cincinnati Service Center	10/08/1999		11/08/1999				Green
Kansas City Service Center	10/08/1999		11/08/1999				Green
Atlanta Service Center	10/08/1999		11/08/1999				Green
Austin Service Center	10/15/1999		11/15/1999				Green
Ogden Service Center	10/15/1999		11/15/1999				Green
Brookhaven Service Center	6661/\$1/01		11/15/1999				Green

Computing Centers:

	0001721700	0001771700	000171701		Croon
nnessee Computing Center	09/1//1999	09/13/1999	10/11/11999		Olcai
Detroit Computing Center	09/24/1999		10/24/1999		Green
Martinsburg Computing Center	10/15/1999		11/15/1999		Green

September 17, 1999

Attachment

Century Date Change Information System Progress Report for Week Ending 09/17/1999

Wall-to-Wall/Reconciliation Inventory Status POC: Rhonda Noon (202) 283-5285
Date as of: 09/15/1999
District Office/Call Sites:

SITE	Expected Date Of Wall-to-Wall Certification	Wall-to-Wall Certification Memos Issued (IS:O:O)	Response to Certification Memos Due (30 days)	Certification of ADP Property Response (Site IS Chief)	Certification of TCS Equipment Response (TCS)	Issues	Status
Atlanta Call Site	10/08/1999		11/08/1999				Green
Brookhaven Call Site	10/15/1999		11/15/1999				Green
Northern California District Office	11/12/1999		12/12/1999				Green
Manhattan District Office	11/19/1999		12/12/1999				Green
Oakland Call Site	11/12/1999		12/12/1999				Green
Ohio District Office	11/12/1999		12/12/1999		-		Green
Cleveland Call Office	11/12/1999		12/12/1999				Green
Kansas-Missouri District Office	11/12/1999		12/12/1999				Green
Clayton Call Site	11/12/1999		12/12/1999				Green
New England District Office	11/12/1999		12/12/1999				Green
Buffalo Call Site	11/12/1999		12/12/1999				Green
Kentucky-Tennessee District Office	11/19/1999		12/19/1999				Green
Nashville Call Site	11/19/1999		12/19/1999				Green
Michigan District Office	11/19/1999		12/19/1999				Green
Detroit Call Site	11/19/1999		12/19/1999				Green
Pacific Northwest District Office	11/19/1999		12/19/1999				Green
Seattle Call Office	11/19/1999		12/19/1999				Green

Attachment

Century Date Change Information System Progress Report for Week Ending 09/17/1999

Wall-to-Wah/Reconciliation Inventory Status POC: Rhonda Noon (202) 283-5285
Date as of: 09/15/1999

SITE Expected Date Of Wall-to-Wall Of Wall-to-Wall And Date An	District Office/Call Sites (Cour.).	HL).						
12/17/1999 01/17/2000 12/17/1999 01/17/2000 12/17/1999 01/17/2000 12/17/1999 01/17/2000 12/17/1999 01/17/2000 12/17/1999 01/17/2000 12/17/1999 01/17/2000	SITE	Expected Date Of Wall-to-Wall Certification	Wall-to-Wall Certification Memos Issued	Response to Certification Memos Due (30 days)	Certification of ADP Property Response (Site IS Chief)	Certification of TCS Equipment Response (TCS)	Issues	Status
Site 12/17/1999 01/17/2000 ict Office 12/17/1999 01/17/2000 ict Office 12/17/1999 01/17/2000 Site 12/17/1999 01/17/2000 Site 12/17/1999 01/17/2000 Site 12/17/1999 01/17/2000	Delaware-Maryland District	12/17/1999		01/17/2000				Green
ict office 12/17/1999 01/17/2000	Office	12/17/1000		01/17/2000				Green
ict Office 12/17/1999 01/17/2000 01/17/2000 Site 12/17/1999 01/17/2000 O1/17/2000 Site 12/17/1999 01/17/2000 O1/17/2000 Site 12/17/1999 01/17/2000 O1/17/2000 O1/17/2	Philadelphia Call Site	0001721701		01/17/2000				Green
12/17/1999 01/17/2000 01/	North Texas District Office	141111999		0000111110				Green
12/17/1999 01/17/2000 Site 12/17/1999 01/17/2000 Site 12/17/1999 01/17/2000 site 12/17/1999 01/17/2000	Dallas Call Site	12/17/1999		01/1//2000				
Site 12/17/1999 01/17/2000 Site 12/17/1999 01/17/2000 site 12/17/1999 01/17/2000	Denver Call Site	12/17/1999		01/17/2000				Green
12/17/1999 01/17/2000 1/17	T-1: Call Site	12/17/1999		01/17/2000				Green
12/17/1999 01/17/2000	Indianapous Can Site	12/17/1999		01/17/2000				Green
	Jacksonville Call Site	12/17/1999		01/17/2000				Green
	Puerto Rico Call Site	121111111						

National Office:

New Carrollton Federal		•	 •	Green
Building				Green
Salubria				
1100000				Green
Constellation				Green
1111 Constitution Ave.				
1# Ctenes Month Hoof				Green
1 Succe, Moint Last				Green
L'Enfant Plaza				Green
Metroplex	•			,
Cruetal Diaza				Creen
Ci ystat i naza				Green
Rosslyn				

September 17, 1999