

Audit

Report



DEFENSE TRANSPORTATION PAY
YEAR 2000 END-TO-END TESTING

Report No. 00-007

October 12, 1999

Office of the Inspector General
Department of Defense

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Acronyms

DFAS	Defense Finance and Accounting Service
DTRS	Defense Transportation Payment System
DTRS-A	Defense Transportation Payment System-Accounting
JITC	Joint Interoperability Test Command
SRD-1	Standard Finance System, Redesign, 1
Y2K	Year 2000

Office of the Inspector General, DoD

Report No. 00-007
(Project No. 9FG-9028.00)

October 12, 1999

Defense Transportation Pay Year 2000 End-to-End Testing

Executive Summary

Introduction. This report is one in a series of reports that the Inspector General, DoD, is issuing in accordance with an informal partnership with the Chief Information Officer, DoD, to monitor DoD efforts in addressing the year 2000 computer challenge. For a list of audit projects addressing the issue, see the year 2000 web pages on the IGnet at <http://www.ignet.gov/>.

Objective. The overall audit objective was to evaluate the effectiveness of the planned end-to-end testing in the DoD transportation pay area. Specifically, we reviewed the Defense Finance and Accounting Service Year 2000 End-to-End Master Plan revision 2.3, dated June 21, 1999, and the plans for conducting end-to-end testing within the transportation pay process. The purpose of end-to-end testing is to verify that the set of interrelated systems supporting an organizational function, such as transportation pay, interoperates as intended in an operational environment.

Results. The Defense Finance and Accounting Service made significant improvements in end-to-end testing of the transportation pay systems. The Defense Finance and Accounting Service plan for end-to-end testing of the transportation pay business process was to use the system-level testing as end-to-end testing. However, at the time of the system-level testing, one of the systems within the thread was not certified as year-2000 compliant. Since that time, the uncertified system has been certified, and the interface between the previously uncertified system and the transportation pay accounting system was successfully re-tested. In addition, tests were performed successfully with the Federal Reserve Bank on September 15, 1999. The transportation pay systems should continue to operate as intended in the year 2000, based on the tests performed. See Audit Results for additional details.

Management Response to Inspector General, DoD, Memorandum. Management actions were responsive to suggestions made during the review of end-to-end tests. In addition, the Defense Finance and Accounting Service took actions based on a memorandum that we issued on July 9, 1999, and contracted with the Joint Interoperability Test Command to review system-level tests to see whether they met the intent of end-to-end testing. Management also promptly implemented Joint Interoperability Test Command recommendations to reduce risks.

Management Comments. We provided a draft of this report on September 17, 1999. Because the draft report contained no recommendations, written comments were not required, and none were received. Therefore, we are publishing this report in final form.

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Background

Addressing the Year 2000 Computing Challenge. The Defense Finance and Accounting Service (DFAS) is the principal agency responsible for DoD accounting and finance processes. DFAS is also responsible for disbursing payments by U.S. Treasury check, by cash, or by electronically transferring funds. In FY 1998, DFAS processed a monthly average of 9.8 million payments to DoD personnel, 1.2 million commercial invoices, 600,000 travel vouchers or settlements, 500,000 savings bonds, and 120,000 transportation bills of lading. The agency's monthly disbursements totaled approximately \$24 billion.

For year 2000 (Y2K) purposes, DFAS identified 45¹ systems as mission critical. For purposes of testing mission-critical systems for Y2K compliance, DFAS identified its business processes considered mission critical and developed plans to test those business processes. Mission-critical processes are defined as those that, if not performed, would preclude or immediately impair the disbursal, pay, and accounting functions. Specifically, DFAS identified the following seven mission-critical business processes: civilian pay, military pay, contractor and vendor pay, transportation pay, travel pay, accounting, and disbursing.

End-to-End Testing. The "end-to-end" process is the flow of data through a set of interconnected systems that performs a core business process, function, or mission. Data flow begins with the initial input of data into the first system and ends with the final receipt of data in the last system and receipt of output by the user. The purpose of Y2K end-to-end testing is to verify that the set of interrelated systems supporting DFAS business processes, such as DoD transportation pay, operates and appropriately processes Y2K-related data.

DFAS has organized its end-to-end testing into seven testing "events," one for each critical mission or business process. DFAS has further divided each event or business process into "threads." A thread represents an end-to-end trace of data using a minimally representative sample of input data through a system or set of systems to produce a sample of output data. Each event can contain one or more "threads" that track to a critical business process.

DFAS Y2K End-to-End Master Plan. DFAS issued the "DFAS Y2K End-to-End Master Plan," revision 2.3, on June 21, 1999 (the DFAS Master Plan), specifically for accomplishing Y2K-related end-to-end testing of its mission-critical business processes. The DFAS Master Plan identifies roles and responsibilities; assumptions and constraints related to testing; interfaces with non-DFAS organizations; and requirements for planning, testing, and reporting on test results.

Roles and Responsibilities. DFAS designated a Y2K project manager and functional proponent at DFAS headquarters with overall Y2K testing

¹ We identified 42 DFAS mission-critical systems in previous audit reports. DFAS recently added three systems to its mission-critical list: the Standard Accounting and Reporting System - One Bill Pay, the Standard Army Financial Accounting and Reporting System, and the Standard Base Supply System.

responsibility. DFAS allowed its functional proponents to assign event leaders and thread leaders to execute the end-to-end testing. Also, DFAS assigned roles and responsibilities to system managers for controlling their segment of the end-to-end testing process.

Assumptions and Constraints. Because of limited time and resources, the DFAS Master Plan acknowledged constraints and identified assumptions related to Y2K end-to-end testing. For example, they included the assumption that third-party software and computing platforms are Y2K compliant, that operations and compliance testing takes precedence over end-to-end testing, that partner organizations will conduct their own internal end-to-end tests and provide input for DFAS, or that all mission-critical systems will have contingency plans in place.

Interface Requirements. The DFAS Master Plan states that each test event will include critical automated interfaces with other departments and agencies. However, because of sizing limitations within the DoD megacenters that support testing, DFAS and the other DoD organizations may not be able to run true end-to-end tests simultaneously. Rather, each organization would maintain sufficient control of its segment of the end-to-end testing process to ensure the integrity of the data flow from one system to the other.

Planning, Testing, and Reporting. The DFAS Master Plan specified requirements for the following.

- **Live Versus Simulation.** DFAS planned to test its business processes under normal operating conditions when possible. Otherwise, DFAS was to use a "time machine" or simulated operating environment and document the reasons and the associated risks.²
- **Critical Dates.** Although the DFAS Master Plan did not designate specific dates for testing, it did recommend that testing cover the following five time periods: the fiscal year 2000 crossover, calendar year 2000 crossover, fiscal year 2001 crossover, calendar year 2001 crossover, and leap year (February 29, 2000). DFAS recommended that dates tested be consistent with dates being tested by interfacing systems.
- **Baselines.** The DFAS Master Plan states that after testing the dates, DFAS organizations will compare their test results to outcomes previously determined as the baseline. (The baseline is the set of known end-to-end test inputs and outputs extracted from systems that have been certified as Y2K compliant.) Each DFAS organization

²A time machine test strategy involves setting system clocks to the year 2000 and operating under testing conditions. Simulation is a program that allows testers to simulate changing dates rather than actually changing the dates during normal operations.

will document the discrepancies between each of the tests and the baseline.

- **Data Analysis and Documentation.** The DFAS Master Plan requires that each DFAS organization develop and document in its test plan a data collection and analysis strategy that provides sufficient information to support end-to-end test design, results, and analysis. The DFAS Master Plan leaves the details for data analysis or documentation to the organizations responsible for testing.

Preliminary Assessment. On May 28, 1999, we provided DFAS with preliminary audit results in a memorandum regarding DFAS planning for end-to-end testing in general. On June 8, 1999, the Director for Information and Technology, DFAS, responded to the issues of roles and responsibilities, Master Plan checklists, interfacing systems, critical crossover dates, data collection and analysis, and the transportation pay event. Appendix B contains a copy of our memorandum, and Appendix C is the DFAS response.

Defense Transportation Payment System

The Defense Transportation Payment System (DTRS) is an interactive, real-time system operating in the DFAS Indianapolis Center. DTRS standardizes transportation payment processing for DoD. The DFAS Indianapolis Center currently processes annual payments of approximately \$1.7 billion to the transportation industry for Army, Air Force, and other DoD organizations. DTRS interfaces include traffic management systems, DoD finance and accounting systems, the General Services Administration post-payment audit system, as well as the transportation carrier industry systems.

This report addresses plans for conducting Y2K end-to-end testing for DoD transportation pay and those test results. Other reports will address other DFAS critical business processes.

Objective

The overall audit objective was to evaluate the effectiveness of the planned end-to-end testing in the DoD transportation pay area. Specifically, we reviewed the DFAS Master Plan and the plans for conducting end-to-end testing within the transportation pay process.

See Appendix A for a discussion of the audit scope and methodology, the management control program, and prior audit coverage related to the audit objective. We will review the sufficiency of contingency plans during future audits.

Planning and Test Results for Defense Transportation Pay End-to-End Testing

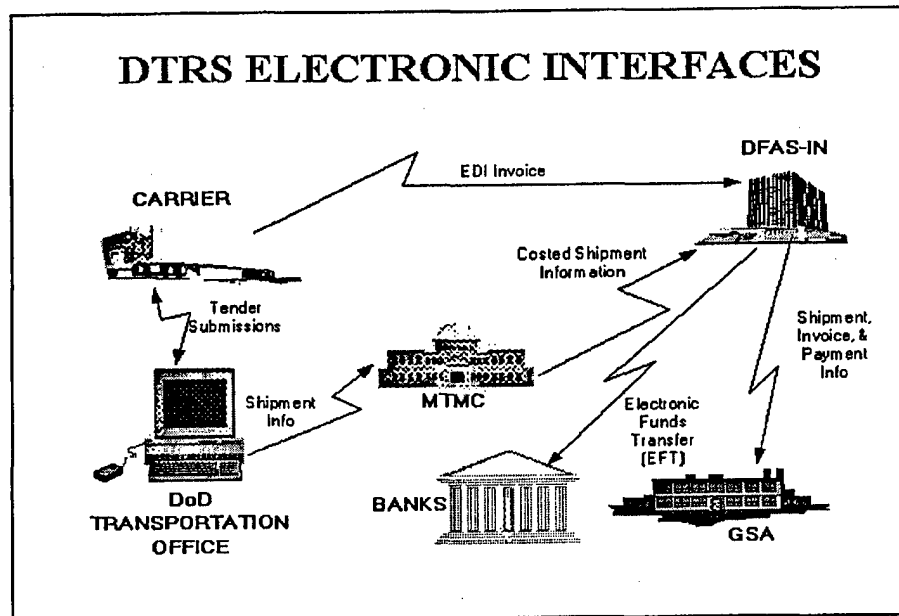
The Defense Finance and Accounting Service (DFAS) made significant improvements in its end-to-end testing for the transportation pay area. The DFAS plan was to use the system-level test results to fulfill the requirements of end-to-end tests. We questioned that rationale, and DFAS took immediate action to have the Joint Interoperability Test Command review the system-level tests to see whether they met the intent of end-to-end tests and to successfully re-test interfaces between systems that were uncertified at the time of the system-level tests. In addition, DFAS scheduled a test with the Federal Reserve Bank on September 15, 1999, to complete the end-to-end testing process. As a result, DFAS reduced the risks associated with processing transportation pay entitlements and demonstrated that the transportation pay systems should continue to operate in the year 2000.

DoD Transportation Pay Process

Transportation Pay Business Process. The DFAS Indianapolis Center supports the business process of producing transportation payments for DoD, except for the Navy and the Marine Corps³. Two automated systems—the DTRS and the Defense Transportation Payment System-Accounting (DTRS-A)—support the transportation pay business process. The two systems interface with and process data from the General Services Administration and the Military Traffic Management Command. Also, the two systems receive disbursing support from the Standard Finance System, Redesign, 1 (SRD-1).

Defense Transportation Payment System. DTRS is an interactive, real-time system operating in the DFAS Indianapolis Center that standardizes transportation payment processing for DoD. The DFAS Indianapolis Center currently processes annual payments of approximately \$1.7 billion to the transportation industry for Army, Air Force, and other DoD organizations. DTRS interfaces include traffic management systems, DoD finance and accounting systems, the General Services Administration post-payment audit system, and the transportation carrier industry systems. The following figure illustrates the DTRS electronic interfaces.

³ Both the Navy and the Marine Corps have systems that interface directly with the Military Traffic Management Command - Financial Management System.



DFAS-IN is DFAS Indianapolis Center.

EDI is electronic data interchange.

GSA is the General Services Administration.

MTMC is the Military Traffic Management Command.

Source: DFAS website: http://dfas4dod.dfas.mil/systems/DTRS/DTRS_EI.htm

Transportation Pay Event Test Plan

The DFAS Y2K End-to-End Master Plan (the DFAS Master Plan) initially identified only the mission of the transportation pay event but did not identify a test plan. The absence of a test plan was brought to the attention of DFAS in a draft report issued by ManTech Y2K Solutions, Incorporated (a subcontractor for the Joint Interoperability Test Command [JITC])⁴. In addition, our memorandum dated May 28, 1999, addressed the need for DFAS to develop a test plan for the transportation pay event. We also questioned the adequacy of system-level tests to suffice for end-to-end tests. (See the memorandum in Appendix B.)

⁴ JITC is the DoD facility for the test and evaluation of information, communication, and intelligence systems interoperability.

DFAS responded to our memorandum by stating that JITC would verify that the systems defined in the transportation pay event had conducted system-level tests that met the requirements of end-to-end testing. DFAS also stated that if any of the system-level tests were not approved by JITC, steps would be taken to complete all or any portion of the end-to-end process as necessary (Appendix C).

The DFAS Master Plan states that assurance can be obtained through use of test scenarios for end-to-end testing of the Defense transportation payment business process. The end-to-end testing would involve live-testing of data through DTRS, DTRS-A, and all interfaces with partnering systems.

We issued another memorandum to the Director of DFAS on July 9, 1999, expressing concern over the use of system-level tests as end-to-end tests. Because the system-level testing was completed on March 2, 1999, and SRD-1 was not certified as being compliant until June 1999, we questioned the validity of using the system-level test to satisfy the requirements of end-to-end testing.

Test Results of System-Level Tests. During the period of July 14 through 16, 1999, JITC reviewed the results of the system-level tests for DTRS and DTRS-A. Based on its initial review, JITC determined that the system-level testing met the requirements of end-to-end testing. In addition, JITC personnel agreed with our concerns about the SRD-1 system not being compliant at the time of testing, and recommended that DFAS conduct additional testing on the interface between DTRS-A and SRD-1.

As a result of the concern that we and JITC had about the interface testing being completed before the SRD-1 being certified as Y2K compliant, DFAS scheduled a retest of the interface between the DTRS and SRD-1. DFAS informed us that the retest was successfully completed the week of August 30, 1999. The successful completion of the interface test demonstrated that the transportation pay process should continue to operate as intended in the year 2000. Because the transportation pay process electronically pays approximately \$1.7 billion annually to the transportation industry, the successful re-test of the interfaces also indicates significant improvement in reducing the risks associated with processing transportation pay entitlements. In addition, DFAS successfully completed a test with the Federal Reserve Bank on September 15, 1999, to complete the end-to-end testing process.

Appendix A. Audit Process

This report is one in a series of reports being issued by the Inspector General, DoD, in accordance with an informal partnership with the Chief Information Officer, DoD, to monitor DFAS efforts to address the Y2K computing challenge. For a list of audit projects addressing the issue, see the Y2K web page on IGnet at <http://www.ignet.gov>.

Scope

We reviewed Y2K reporting requirements and policies that the Office of the Secretary of Defense and DFAS issued. We reviewed the DFAS Master Plan and held discussions with DFAS managers and JITC evaluators to obtain additional information and clarification on the transportation pay event and the test results of the system-level tests qualifying as end-to-end tests. At the time of this audit, the DFAS Indianapolis Center processed annual payments of approximately \$1.7 billion to the transportation industry for Army, Air Force, and other DoD organizations.

DoD-Wide Corporate-Level Government Performance and Results Act Goals. In response to the Government Performance and Results Act, the Department of Defense has established 2 DoD-wide goals with 7 subordinate performance goals. This report pertains to achievement of the following objectives and goal.

DOD-wide Goal: Prepare now for an uncertain future by pursuing a focused modernization effort that maintains U.S. qualitative superiority in key warfighting capabilities. Transform the force by exploiting the Revolution in Military Affairs, and reengineer the Department to achieve a 21st century infrastructure. **Subordinate Performance Goal:** Transform U.S. military forces for the future. (DoD-2.2)

DoD Functional Area Reform Goals. Most major DoD functional areas have also established performance improvement reform objectives and goals. This report pertains to achievement of the following functional area objectives and goals.

- **Information Technology Management Functional Area.**
Objective: Become a mission partner. **Goal:** Serve mission information users as customers. (Information Technology Management-1.2)
- **Information Technology Management Functional Area.**
Objective: Provide services that satisfy customer information needs. **Goal:** Modernize and integrate Defense information infrastructure. (Information Technology Management-2.2)

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- **Information Technology Management Functional Area.**
Objective: Provide services that satisfy customer information needs.
Goal: Upgrade technology base. (Information Technology Management-2.3)
 - **Information Technology Management Functional Area.**
Objective: Reengineer DoD business practices. **Goal:** Modify existing systems and monitor new systems to be Y2K compliant. (Financial Management-4.3)

General Accounting Office High-Risk Area. The General Accounting Office has identified several high-risk areas in DoD. This report provides coverage of the Information Management and Technology high-risk area. In its identification of risk areas, the Y2K problem has been specifically designated as high risk by the General Accounting Office.

Methodology

Audit Type, Dates, and Standards. We performed this program audit from April through September 1999, in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. We did not use statistical sampling methods or computer-processed data for this audit.

Use of Technical Assistance. We met with technical experts from JITC to discuss their views on the sufficiency of the system-level tests qualifying as end-to-end tests, and we met with software engineers from the Technical Assessment Division of the Analysis, Planning, and Quality Assurance Division. JITC is the DoD facility for the test and evaluation of information, communication, and intelligence systems interoperability. JITC also has experienced test professionals available on a fee-for-service basis. The JITC mission is to be the preeminent information systems evaluator, reducing the risk to the warfighter by providing value-added process and product evaluations, operational assessments, and technical assistance throughout the life cycle of DoD systems.

Contacts During the Audit. We visited or contacted individuals and organizations within DoD. Further details are available upon request.

Management Control Program. We did not review the management control program related to the overall audit objective because DoD recognized the Y2K issue as a material management control weakness area in the FY 1998 Annual Statement of Assurance.

Summary of Prior Coverage

The General Accounting Office and the Inspector General, DoD, have conducted multiple reviews related to the Y2K issues. General Accounting Office reports can be accessed over the Internet at <http://www.gao.gov/>. Inspector General, DoD, reports can be accessed over the Internet at <http://www.dodig.osd.mil/>.

Appendix B. Inspector General, DoD, Interim Reporting on End-to-End Test Plans



INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-2884

MAY 28 1999

MEMORANDUM FOR DIRECTOR FOR INFORMATION AND TECHNOLOGY,
DEFENSE FINANCE AND ACCOUNTING SERVICE

SUBJECT: Status of Audits of Finance Functional Area Year 2000 End-to-End Tests

In April 1999, we initiated the following audit projects to evaluate the effectiveness of Y2K end-to-end testing by the Defense Finance and Accounting Services (DFAS). The projects were aligned by functional area in accordance with the functional break-out identified by DFAS

Civilian Pay	Project 9FG-9025
Military/Retiree/Annuitant Pay	Project 9FG-9026
Vendor/Contractor Pay	Project 9FG-9027
Transportation Pay	Project 9FG-9028
Disbursing	Project 9FG-9029
Accounting	Project 9FG-9030
Travel Pay	Project 9FG-9031

Our review, to date, has focused on analyzing the adequacy of test plans for the seven areas. We evaluated the adequacy of the DFAS Y2K test plans using requirements contained in the DoD Y2K Management Plan, Version 2.1, Appendix I; the DFAS Y2K Management Plan, Version 1.0; the DFAS Y2K End-to-End Master Plan, Version 2.1; the DFAS Regulation 8000.1-R, "Information Management and Instruction Guidance," Version 5.0; and the GAO Operational Evaluation Assessment Tool. We anticipate future audits will assess test results and contingency planning efforts by DFAS.

Because of the urgency of Year 2000 efforts, our intent is to communicate potential areas of concern as quickly as possible so that management may address these issues in a timely manner. The attachment to this memorandum reports the initial results of our review. During our preliminary review, we identified concerns regarding the adequacy of DFAS planning efforts for functional end-to-end testing. If these concerns are not addressed, there is increased risk that DFAS end-to-end testing may not detect a significant Y2K problem. We may include these and any additional issues in a draft report at a later date. We request that you provide a response to this memorandum by June 8, 1999. If there are any questions, please contact Ms. Kimberley Caprio, Program Director at (703) 604-9139 or DSN 664-9139.

F. Jay Lane
Director

Finance and Accounting Directorate

DFAS has made significant progress in addressing testing requirements for its functional areas including the issuance of a Master Plan, identification of levels of responsibility, and checklists for test planning purposes. During our review, we identified the following concerns that should be addressed by DFAS. On May 27, 1999, we met with DFAS officials to discuss the concerns and actions to be taken.

1. Roles and Responsibilities. The DFAS Master Plan identified four levels of responsibility for end to end testing including Headquarters functional proponents, systems managers, event leaders, and thread leaders. The Plan defined roles and responsibilities for functional proponents and systems managers, but did not provide details on the responsibilities for either the event or thread leaders. During the May 27, 1999 meeting, DFAS Headquarters personnel, acknowledged the need for oversight and agreed to provide the details immediately.

In addition, the Master Plan was not issued until May 11, 1999, and in some cases had not arrived at the event leader level until May 18, 1999. However, functional event plans and allocation of responsibilities was already occurring. As a result, the individuals delegated the responsibilities may not have been appropriate. For example, for the Travel pay event, the same person was tasked as both the functional proponent and the event leader. As a result, it precludes the separation of duties by allowing one function to oversee the other function. To ensure that the 4 levels of responsibility are appropriately staffed, the DFAS Headquarters Project Office should review the assigned personnel and ensure that they are aware and understand their delegated responsibilities.

2. Master Plan Checklists. The DFAS Y2K Master Plan included four checklists to be used by DFAS Headquarters personnel, the functional area proponent, the event leader, and the tester. These checklists require DFAS personnel to assess the effectiveness of the end-to-end testing program at each designated level including such items as assessing the adequacy of testing staff, funds, and interface agreements. The DFAS Master Plan stated that these checklists would "provide independent auditors with evidence of compliance with the end-to-end test requirements," however, the Master Plan did not make completion of the checklists mandatory.

We believe the checklists should be mandatory and maintained at the functional level along with test results. The 2 to 3 page checklists provide an excellent means to ensure and document that essential steps were taken prior to performing end to end testing of DFAS functional areas. Completion of the planning section of these checklists provides a tool to help ensure compliance with the Master Plan requirements and allow for early corrections of deviations or omissions from the plan. Further, use of the checklist affords standardization of the process used throughout DFAS for end to end test planning efforts. Without the use of the checklists, DFAS lacks assurance that the testing was complete, adequate, and consistent. We also believe that a

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signature block or notation should be included in the checklists to establish accountability for the responses and to facilitate quick actions should a problem arise later.

3. **Interfacing Systems.** DFAS relies heavily on interfacing systems to provide the majority of data included in DFAS systems. As such, coordination and compatibility of data exchanged with interfacing systems is critical to ensuring successful Y2K end to end tests. If data from a non-compliant system feeds into a DFAS system, the potential exists for the DFAS system to not be able to function properly after Y2K. The level of assurance being obtained by DFAS functional area officials regarding Y2K compliance of interfacing systems varies from exchanging documentation to merely assuming that interfacing systems are compliant or relying on verbal responses.

Given the significant potential impact of interfaces on successful testing, we believe that DFAS functional leaders should take the extra step to validate that key interfacing systems are, in fact, compliant. Information on the compliance of each DoD mission critical system should be available in the OSD database. As such, DFAS personnel for the functional areas should be able to access the database and validate that those applicable interfacing partners are clearly designated as Y2K compliant before entering the end-to-end test. We discussed this matter with DFAS Headquarters officials who agreed that, while they are only testing with compliant interfacing partners, it is reasonable that DFAS review the database to ensure that interfacing partners are compliant prior to testing.

4. **Critical Crossover Dates.** The DFAS Master Plan identified 5 critical crossover dates as mandatory for inclusion during end-to-end tests. The dates are consistent with the 5 dates recommended by the Assistant Secretary Defense (Command, Control, Communications, and Intelligence). The dates are fiscal year 2000, calendar year 2000, leap year crossing (February 29, 2000), fiscal year 2001, and calendar year 2001. Developers of DFAS test plans have not planned to test all 5 dates. For example, the Marine Corp Total Force System is only testing the leap year 2000 crossover. The Computerized Accounts Payable System is not testing the fiscal year and the calendar year 2001 crossovers. The reduced number of dates being tested is a result of:

- The test plans being developed prior to the issuance of the DFAS Master Plan on May 11, 1999,
- Personnel pay systems, for example, not being impacted by fiscal year changes,
- Funding being allocated based on test plans developed prior to the Master Plan.

In order to ensure compatibility of interfacing systems, it is important that the same dates are tested, particularly where DFAS systems feed data to other systems. For example, data from systems within the Travel Pay test event feed into systems within the Disbursing test event. Further, once processed within disbursing, data is fed to both

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accounting and back to travel systems. Incoming files to the Automated Disbursing System (ADS) (part of the Disbursing test event) plan to test all dates specified in the DFAS Y2K Master Plan. However, the Travel Pay test event does not plan to test the fiscal year 2000 to 2001 crossover. As a result, the potential exists that data relying on the fiscal year 2000 to 2001 crossover may not function properly. Meanwhile, DFAS may report a successful test based on the less than 5 dates being tested.

It is important that interfacing systems select test dates in a similar manner to ensure Y2K data flows through each system appropriately. DFAS functional leaders should ensure that critical crossover dates for each of the seven functional areas are compatible prior to testing.

5. Data Collection and Analysis. The DoD Y2K Management Plan states that Y2K event output products such as plans and procedures should specify in detail what data needs to be collected, who will analyze the data, and how it will be analyzed. Essentially, the requirement is to define expected test results. Consistent with the DoD Plan, the DFAS Master Plan requires, as exit criteria to the test planning phase, that responsible parties specify pass/fail criteria for all tests, that data collection procedures are in place, and mechanisms needed to capture data are installed. The DFAS Master Plan, however, does not specify:

- What types of data should be collected to ensure consistency in reporting test results.
- A methodology for each DFAS organization to document the data collection process in the appropriate Event Plan

For the 7 DFAS functional events, data collection and data analysis plans are either nonexistent or do not ensure the tests will be judged objectively. For example, the Defense Industrial Financial Management System (DIFMS) Test Plan, which is part of the Accounting Test Event, plans to review reports, queried data, and DIFMS screens to accomplish data analysis, but did not establish expected test results criteria or a baseline that could be used to determine the adequacy or accuracy of the reports, queries, and screens. As another example, the Civilian Pay Event lacks either a data collection plan or a data analysis plan. Instead, the Event Leader indicated that years of prior testing and DCPS experience will identify discrepancies should they arise.

Both DoD and DFAS require the establishment of a structured approach to testing including identifying expected outcomes, test participants, and other details. Without such plans, there is no organized or standardized approach between the participating systems, nor any assurance that test goals are met and tests were successful. Given the nature of end-to-end testing, with its large numbers of participating or "partner" systems, it is prudent to ensure that the data collection is as consistent as possible for each event, and that the analysis of the test data is objective. Without the definition of data collection and data analysis plans before testing begins, this will be difficult.

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DFAS Functional Test Leaders need to ensure that detailed test collection, results, and analysis requirements are clearly defined prior to testing.

6. **Transportation Pay Event.** DFAS identified Transportation Pay as one of the 7 functional areas for testing purposes. However, DFAS has not yet developed an end-to-end test plan for the event. There are two systems involved in transportation, the Defense Transportation Pay System (DTRS) and the Military Traffic Management Command - Financial Management System (MTMC-FMS). The Transportation Pay Event Leader stated that MTMC-FMS testing during Y2K conversion process accomplished the end-to-end requirements of the Master Plan. DFAS has subsequently contracted with the Joint Interoperability Testing Command (JITC) to independently verify and validate the prior testing. We plan to follow-up on this functional area

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Appendix C. Defense Finance and Accounting Service Response to Inspector General, DoD, Interim Report



DEFENSE FINANCE AND ACCOUNTING SERVICE

1931 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22240-3291

JUN 8 1999

DFAS-HQ/S

MEMORANDUM FOR DIRECTOR, FINANCE AND ACCOUNTING DIRECTORATE
OFFICE OF THE INSPECTOR GENERAL, DEPARTMENT OF
DEFENSE

SUBJECT: Status of Audits of Financial Functional Area
Year 2000 End-to-End Tests

The attached outlines Defense Finance and Accounting Service (DFAS) response to the DoD Inspector General's (IG) initial review of and concerns about DFAS' End-to-End Test (E2E) Plans. DFAS recognizes that a great deal of work is still to be done to ensure all necessary requirements for E2E are accomplished. To meet this goal, DFAS has conducted meetings with event and thread leaders to review all E2E guidelines and requirements.

All concerns addressed in the DoD IG's memo are being addressed.

Roles and Responsibilities: Concur. Action to expand event and thread leader roles will be accomplished by June 25, 1999.


Master Plan Checklist: Non-concur. DFAS will not mandate the checklist.

Interfacing Systems: Concur. This action is considered completed, but with periodic updates.

Critical Crossover Dates: Concur. This action is completed.

Data Collection and Analysis: Concur. This is an ongoing action with no specific target date.

Transportation Pay Event: Concur. This is an ongoing action with a target completion date of June 30, 1999.


C. Vance Kauzlarich
Director for Information and Technology

Attachment:
As Stated

Roles and Responsibilities. Concur. DFAS acknowledges that testing and planning activities were occurring prior to the issuance of the Master Plan on 6 May. However, several coordination meetings had already occurred and guidance on developing Event Plans was issued on 31 March. DFAS also acknowledges the need to clarify and augment the roles and responsibilities of the event and thread leaders in the DFAS E2E Master Plan. We are currently making site visits and meeting with the testing teams to clarify roles and responsibilities and are updating the Master plan as well. It should be noted there may be an overlap in the area of responsibility, due to the fact that the internal DFAS support structure for each business process/application has a great bearing upon the specific breakout of roles and responsibilities. DFAS does not view this as a conflict or an inappropriate assignment of duties.

Master Plan Checklist. Non-concur. DFAS designed and issued these checklists as tools to assist DFAS personnel responsible for planning, tracking, and conducting end to end testing. Because each business area/application has a normal testing practice already established, DFAS did not make the checklists mandatory, and would prefer to keep the use of checklists optional. However, DFAS will encourage the use of the checklists whenever possible.

Interfacing Systems. Concur. DFAS agrees that coordination and compatibility of data exchange between DFAS systems and their interface partners is essential to a successful Y2K effort. DFAS has pursued this goal for the past two years. DFAS has established Interface Agreements with all of its interface partners. This effort generated in excess of 1400 agreements. In addition, DFAS has tracked and updated on a monthly basis the status of testing and compliance of each of its interface partners. DFAS system managers are well aware of the status of each of its partners. DFAS will continue to track and monitor the status of its interface partners mission critical and other.

Critical Crossover Dates. Concur. DFAS acknowledges the importance of testing as many dates as possible, and the coordination of these dates among partners. All DFAS managers have been encouraged to coordinate this initiative with all pertinent parties. It must be understood that dates do not necessarily play an important part in the relationship of one system to another. The DFAS E2E Master Plan has recently been updated to empower the Functional

Managers with determining which dates are critical for testing within their specific business process. We have also hired JITC to independently validate and verify our planning efforts.

Data Collection and Analysis. Concur. DFAS agrees that current plans lack specific exit criteria and we are taking action to strengthen this area of our plans. DFAS 8000.1-R, Part E, Chapter 3, Test and Evaluation provides guidance concerning data collection and analysis. Our central design activities normally plan and execute their tests, using this guidance, precluding the need for specific guidance to be issued relative to E2E testing.

Each testing agent within DFAS implements the regulation within their own construct, resulting in a non-standard, but successful, data collection and analysis process. Because Y2K E2E testing requirements are not system centric, but business process centric, we have hired JITC to independently validate and verify our E2E planning and testing efforts. The JITC analysis/evaluation will document specific risks associated with data collection and analysis procedures, in sufficient time for us to take corrective action.

Another measure of risk mitigation is to conduct site visits, where we meet with all thread participants. During these meetings we are emphasizing the need for adequate documentation of their data collection and analysis procedures, as well as documenting version control and configuration management procedures.

Transportation Pay Event. Concur. In addition to the Transportation Pay System, DFAS has identified several other systems, which claim completion of the end to end testing initiative. JITC will be used to verify that these systems indeed have met E2E requirements. If any system fails to pass the validation of JITC, steps will be initiated to complete all or any portion of the E2E process that needs to be completed.

Appendix D. Report Distribution

Office of the Secretary of Defense

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Congressional Committees and Subcommittees, Chairman and Ranking Minority Member

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Senate Committee on Armed Services
Senate Committee on Governmental Affairs
Senate Special Committee on the Year 2000 Technology Problem
House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
House Committee on Armed Services
House Committee on Government Reform
House Subcommittee on Government Management, Information, and Technology, Committee on Government Reform
House Subcommittee on National Security, Veterans Affairs, and International Relations, Committee on Government Reform
House Subcommittee on Technology, Committee on Science

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