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END-TO-END TESTING FOR PERSONNEL SYSTEMS

Report Number 00-025

October 26, 1999

Office of the Inspector General
Department of Defense

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Acronyms

DCPDS
USD(P&R)
Y2K

Defense Civilian Personnel Data System
Under Secretary of Defense for Personnel and Readiness
Year 2000



INSPECTOR GENERAL
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October 26, 1999

MEMORANDUM FOR ASSISTANT SECRETARY OF THE NAVY (FINANCIAL
MANAGEMENT AND COMPTROLLER)

SUBJECT: Audit Report on End-to-End Testing for Personnel Systems
(Report No. 00-025)

We are providing this report for your information and use. We considered management comments on a draft of this report in preparing the final report. Comments on a draft of this report conformed to the requirements of Directive 7650.3, and left no unresolved issues; therefore, additional comments are not required.

We appreciate the courtesies extended to the audit staff. For additional information on this report, please contact Mr. Charles M. Santoni at (703) 604-9051 (DSN 664-9051) (csantoni@dodig.osd.mil) or Mr. Robert L. Shaffer at (703) 604-9043 (DSN 664-9043) (rshaffer@dodig.osd.mil). See Appendix B for the report distribution. The audit team members are listed inside the back cover.

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Office of the Inspector General, DoD

Report No. 00-025
(Project No. 9AL-0098)

October 26, 1999

End-to-End Testing for Personnel Systems

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 DoD Chief Information Officer to monitor DoD efforts in addressing the year 2000 computer challenge. For a listing of audit projects addressing the issue, see the year 2000 web pages on the IGnet at <http://www.ignet.gov>.

The "DoD Year 2000 Management Plan," Appendix I, "Guidelines to Support DoD Y2K Operational Readiness," assigns responsibility to the Principal Staff Assistants for "ensuring the end-to-end functional process flows that support their functional area are assessed either in a JS/CINC [Joint Staff/Commander In Chief] Y2K Op Eval [Operational Evaluation], a Service-sponsored System Integration Test, or through a Functional-Area Y2K End-to-End Test." Appendix I also states that the Principal Staff Assistants' responsibilities include "planning, executing, and evaluating all mission-critical systems not otherwise tested and for ensuring that processes that fall within their purview are evaluated." The Under Secretary of Defense for Personnel and Readiness performs those functions for personnel.

Objectives. The overall objective was to evaluate the effectiveness of the planned year 2000 end-to-end tests for personnel systems. Specifically, we reviewed the test plans and the results of selected test events. The purpose of end-to-end testing is to verify that the test of interrelated systems supporting an organization function such as personnel transactions operate as intended in an operational environment.

Results. The Army, Navy, Air Force, and Marine Corps have been conducting end-to-end testing of their personnel systems. More needs to be done to provide assurance that personnel systems will function properly in the year 2000. Because the Navy did not begin its testing until September 1999, a risk exists that the Navy will not complete its end-to-end testing and analysis of the testing of its systems before the year 2000, although the Navy remains confident that the testing plan can be executed.

The Air Force end-to-end test involving the Defense Civilian Personnel Data System was not as rigorous as required by the criteria set forth in "DoD Year 2000 Management Plan." Specifically, the "DoD Year 2000 Management Plan" states that each mission-critical system must be evaluated at least once in either a functional area year 2000 end-to-end test or a Service-sponsored year 2000 system integration test. The Air Force chose to use test data that it saved from the system certification test of

the Defense Civilian Personnel Data System for its end-to-end testing. As a result, the end-to-end test as conducted did not provide additional assurance that year 2000 risk for the Defense Civilian Personnel Data System had been reduced. See the Finding section of the report for a discussion of the audit results.

Summary of Recommendations. Sufficient risk remains to warrant additional risk mitigation measures by the Navy. To provide additional assurance that the year 2000 risk in personnel systems is reduced, we recommend that the Deputy Chief of Naval Personnel require that interface reexamination procedures be performed for all Navy mission-critical personnel systems and that advanced automated scanning tools be used to examine 100 percent of the application software for those systems.

Because of the remaining risk of not exercising the Defense Civilian Personnel Data System in the end-to-end test, the effectiveness of the contingency plan for the Defense Civilian Personnel Data System and the results of exercising the contingency plan become increasingly important. We are not making a recommendation to the Air Force because the Inspector General, DoD, has announced an audit of the effectiveness of year 2000 operational contingency plans for DoD personnel systems, which will include the Defense Civilian Personnel Data System. In addition, the Air Force has plans to scan the application software in its mission-critical personnel and finance systems.

Management Comments. The Chief of Naval Personnel, Bureau of Naval Personnel, concurred and stated that end-to-end testing started September 4, 1999, and will be completed by the end of October. The Navy also stated that code scanning was in process, interface testing is a continuous ongoing process, and that draft contingency of operations plans were developed. The Navy was confident that the personnel systems will operate after January 1, 2000. The Air Force disagreed that its testing was not as rigorous as required by the DoD Year 2000 Management Plan. A discussion of management comments is in the Finding section of the report, and the complete text is in the Management Comments section.

Audit Response. The Navy comments were responsive. Although there was extensive Air Force testing, the Defense Civilian Personnel Data System was not exercised in a separate, higher level test as required by the DoD Year 2000 Management Plan.

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Background

The Year 2000 (Y2K) Problem. Computer systems have typically been designed to use only the last two digits for the year; thus, the year 2000 is indistinguishable from the year 1900. As a consequence, computers and associated software that use dates to calculate, compare, or sort data could generate incorrect results when working with years after 1999. The potential for computer system failure after the year 1999 is often referred to as the Y2K problem.

End-to-End Testing. The end-to-end process is a complete flow of data through a set of interconnected systems that perform a core business process, function or mission. Data flow begins with the initial input (external input) to the first system from a user or customer and ends with either the final receipt of information in the final destination systems or receipt of output by the user or customer.

Executive Order. Because of the potential failure of computers to function throughout the Government, the President issued Executive Order 13073, "Year 2000 Conversion," February 4, 1998, making it policy that Federal agencies ensure that no critical Federal program experiences disruption because of the Y2K problem. The order requires that the head of each agency ensure that efforts to address the Y2K problem receive the highest priority attention in the agency.

Public Law. Public Law 105-261, "National Defense Authorization Act for Fiscal Year 1999," October 17, 1998, Section 334(b) directs that the Secretary of Defense ensure that "all mission-critical systems that are expected to be used if the Armed Forces are involved in a conflict in a major theater of war are tested in at least two exercises." In addition, Section 334(d), states:

Alternative Testing Method. In the case of an information technology or national security system for which a simulated Y2K test as a part of a military exercise described in subsection (c) is not feasible or presents undue risk, the Secretary of Defense shall test the system using a functional end-to-end test or through a Defense Major Range and Test Facility Base

DoD Year 2000 Management Strategy. In his role as the DoD Chief Information Officer, the Senior Civilian Official, Office of the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence), issued the "DoD Year 2000 Management Plan" (DoD Management Plan) in December 1998. The DoD Management Plan requires DoD Components to implement a five-phase (awareness, assessment, renovation, validation, and implementation) Y2K management process to be completed by December 31, 1998, for mission-critical systems.

The DoD Management Plan provides guidance for implementing the Deputy Secretary of Defense Memorandum, "Year 2000 Verification of National Security Capabilities," August 24, 1998. The memorandum requires that each Principal Staff Assistant of the Office of the Secretary of Defense "verify that all functions under his or her purview will continue unaffected by Y2K issues." That verification was to be performed after completion of the five-phased management approach that culminated with the completion of the implementation phase. Further verification testing was to be conducted during the first half of 1999 and was to be planned and conducted from a mission perspective, rather than a system perspective, to increase the confidence that any errors or omissions in system remediation would be found.

Objectives

The overall objective was to evaluate the effectiveness of the planned year 2000 end-to-end tests for personnel systems. Specifically, we reviewed the test plans and the results of selected test events. See Appendix A for a discussion of the audit scope, methodology, and prior audit coverage.

End-to-End Testing of Personnel Systems

The Army, Navy, Air Force, and Marine Corps have been conducting end-to-end testing of their personnel systems. However, more needs to be done to provide assurance that personnel systems will function properly in the year 2000. Because the Navy did not begin its testing until September 1999, a risk exists that the Navy will not complete its end-to-end testing and analysis of the testing of its systems before the year 2000, although the Navy remains confident that the testing plan can be executed. Also, the Air Force end-to-end test involving the Defense Civilian Personnel Data System was not as rigorous as required by the criteria set forth in DoD Management Plan. Instead, the Air Force chose to use test data that it saved from the system certification test of the Defense Civilian Personnel Data System. As a result, the end-to-end test as conducted did not provide additional assurances that year 2000 risk for the Defense Civilian Personnel Data System had been reduced.

DoD Guidance

The DoD Management Plan, Appendix I, "Guidelines to Support DoD Y2K Operational Readiness," assigns responsibility to the Principal Staff Assistants for "ensuring the end-to-end functional process flows that support their functional area are assessed either in a JS/CINC [Joint Staff/Commander In Chief] Y2K Op Eval [Operational Evaluation], a Service-sponsored System Integration Test, or through a Functional-Area Y2K End-to-End Test." Appendix I also states that the Principal Staff Assistants' responsibilities include "planning, executing, and evaluating all mission-critical systems not otherwise tested and for ensuring that processes that fall within their purview are evaluated."

The Under Secretary of Defense for Personnel and Readiness (USD[P&R]) performs those functions for the personnel functional area. As the Principal Staff Assistant for personnel, the USD(P&R) had the responsibility to:

- provide functional end-to-end test plans;
- certify that the test plans include assessments of functional risk, effects of Y2K on continuity of business operations, and associated contingency plans;
- ensure that all test plans include a listing of all mission-critical systems to be involved in each test; and
- coordinate each test plan with the Military Services and all other pertinent Principal Staff Assistants.

Personnel Systems Environment

DoD military personnel, manpower, and training systems are primarily developed, funded, and operated by the Military Services. Each Military Service has a unique set of military personnel requirements that involve numerous systems and interfaces. While some functional cross-Service activity occurs, this generally happens outside of the information technology area. As a result, each Military Service needed to plan and conduct its own end-to-end test for personnel systems. Also, each Military Service was developing its own test plans, contingency plans, and continuity of operation plans. Civilian personnel functions within DoD are managed through a single personnel system, the Defense Civilian Personnel Data System (DCPDS), managed by the Defense Civilian Personnel Management Service, which contracts with the Air Force to operate the legacy and interim DCPDS.

DoD Personnel Functions

The USD(P&R) developed the Master Plan, April 5, 1999, to provide policy oversight and to coordinate DoD-wide initiatives and reporting for personnel systems Y2K functional end-to-end testing. The Master Plan was augmented with draft test plans from the Army, Navy, Air Force, and Marine Corps. The Master Plan focuses on identifying the test threads to be tested and the supporting programs and interfaces that are essential for successful operation of a thread. A thread is a group of systems that support a core process or critical function. The Military Services are required to fully evaluate all functions that the USD(P&R) designated as critical. To ensure the critical functions within the personnel area were tested and operational, the USD(P&R) identified the following eight personnel functions critical to support the soldier during wartime and provided a brief description.

- Access: the functional process for bringing civilians into the Military Services.
- Mobilize: the activation of guard and reserve members to active duty status.
- Deploy: the personnel activities relating to the movement of personnel from their normal duty station to the site of an operational location where they are needed.
- Locate: the Military Services' ability to find individuals based on a geographic location code.
- Pay: the ability to provide personnel data to the pay systems.
- Separate: the separation of a member from the Military Service for all reasons.

-
- Retire: the regular and disability retirement process from the Services.
 - Casualty Support: the activities dealing with supporting the reporting and tracking of casualties.

The Master Plan states that the USD(P&R) will ensure that the Military Services' end-to-end testing efforts incorporate the requirements necessary to conduct the test. It also states that the USD(P&R) will participate in verification of the test and test results of the Military Services functional personnel end-to-end tests.

The end-to-end testing of personnel systems supporting the 8 critical functions was limited to 36 of the 91 mission-critical personnel systems that the USD(P&R) and the Military Services identified. The 36 mission-critical systems appeared in 50 thinline threads in the 8 mission-critical personnel functions that needed to be tested.

Scheduling the Personnel End-to-End Testing

The Army, Air Force, and Marine Corps have completed their portions of the actual end-to-end testing of personnel systems. They were evaluating results and waiting for the Defense Finance and Accounting Service to coordinate and complete the testing. The Navy was not able to start its testing until September 1999, with a completion date of October 17, 1999. Several factors led to the delay in starting the testing. The memorandum of agreement for system certification testing requirements between the Navy and the Defense Information Systems Agency was signed on September 15, 1998. The Defense Information Systems Agency was unable to provide the necessary platforms, manpower, and services to meet the original test requirements identified by the Navy for its mission-critical systems to be tested in accordance with the DoD year 2000 system certification process. Further complicating matters, the Defense Information Systems Agency was also contemplating moving the Navy systems from the Defense Megacenter - Chambersburg, Pennsylvania, to the Defense Megacenter - Columbus, Ohio, in early 1999. The Navy then had to refine the requirement and obtain Defense Information Systems Agency agreement that the migration of personnel would not occur until after Y2K. In the agreement for system certification testing, January 31, 1999, was established as the availability date of hardware and personnel needed to start the testing and remediation of systems. The requirement for DoD mandated end-to-end testing had not been identified when the agreement was signed. During the remediation period, the DoD identified a need to conduct end-to-end testing for mission-critical personnel and readiness functions. The requirements for the end-to-end testing mirrored the hardware, software, and personnel requirements that were allocated to the system certification testing. A memorandum of agreement for the end-to-end testing was signed between the Navy and the Defense Information Systems Agency on April 27, 1999. However, the end-to-end testing could not begin until the Navy had completed Y2K system

certification for all mission-critical systems. The end-to-end testing began in September 1999. The following table shows start and completion dates for the Military Services' personnel end-to-end testing.

Military Services End-to-End Personnel Testing Schedule

<u>Military Service</u>	<u>Dates of Testing</u>	
	<u>Start</u>	<u>Completion</u>
Army	June 1, 1999	July 23, 1999
Navy	September 4, 1999	October 17, 1999
Air Force	May 1, 1999	June 30, 1999
Marine Corps	July 26, 1999	August 20, 1999

By not being able to start its end-to-end testing until September 1999, the Navy may not have sufficient time to complete the testing, evaluate the test results, resolve Y2K issues that might be encountered, and retest, if necessary. As the table above indicates, the actual testing for the Army and the Air Force took one to two months. The Army and Air Force planned to take an additional month or longer to evaluate the results and prepare the test reports for their end-to-end tests. In addition, the Air Force was waiting for feedback on data submitted to the Defense Finance and Accounting Service for the portion of the end-to-end test related to pay. The Army was also waiting for the Defense Finance and Accounting Service to finalize details on how they will exchange data in completing the end-to-end test on the pay function. The Marine Corps scheduled additional end-to-end testing of the mobilization function.

The USD(P&R) has expressed concerns regarding the Navy ability to complete end-to-end testing of its personnel systems within the timeframe established. The USD(P&R) concerns related to the possible lack of Navy financial resources to accomplish the required testing and lack of the Bureau of Naval Personnel system documentation and institutional knowledge. Although the Navy was confident that it will be able to resolve any Y2K errors before the start of year 2000, its timing is such that a significant amount of remaining risk exists to warrant placing particular importance on the validity of the contingency plans. Additional risk mitigation measures are needed and the USD(P&R) needs to be aware of the results of the actions taken. One such measure would be an independent review of the contingency plans and the results of exercising the contingency plans for the personnel systems in the Navy. We are not making a recommendation concerning contingency plans because, on August 5, 1999, the Inspector General, DoD, announced an audit of "Year 2000 Contingency Plans for Personnel Systems." The objective of that audit is to evaluate the effectiveness of the year 2000 operational contingency plans for personnel systems. The review should determine if the contingency plans detail the procedures necessary to restore a system in the face of all anticipated and unanticipated Y2K disruptions and also provide for continuing operations when support from a single system or group of closely related systems is disrupted.

Use of System Level Test Results for End-to-End Testing

The Air Force end-to-end test involving the DCPDS was not as rigorous as required by the criteria set forth in DoD Management Plan. The DoD Management Plan clearly states that upon completion of the testing of the individual systems using the five-phase process, it is necessary to demonstrate the Y2K readiness of systems in an integrated, operational environment. Specifically, with few exceptions, all mission-critical systems must be evaluated at least once in either a functional area Y2K end-to-end test or a Service-sponsored Y2K System Integration Test. The DCPDS did complete the system-level test, but the DCPDS was not exercised in a separate, higher level test as required by the Defense Management Plan. An end-to-end test is conducted by inputting data into the system, allowing the system to process the data, and passing the data to other systems involved in the end-to-end testing. Instead of including DCPDS in the end-to-end test, the Air Force chose to use test data that it saved from the system certification test of the DCPDS for its end-to-end testing. The data from the DCPDS was properly passed to other systems; therefore, the interfaces between those systems were properly tested. However, the Air Force did not retest input and processing by the DCPDS during the end-to-end test.

The Air Force stated that there were several advantages to using the saved data. The Air Force was able to save \$2.3 million by eliminating the need to replicate the DCPDS hardware for the end-to-end test, duplicate the operation of the DCPDS just as it is used in the field, and process and test more personnel transactions affecting pay. After self-certification of the system, the Air Force saved the data and transactions from the system test. The participation of the DCPDS in the end-to-end test merely consisted of the DCPDS passing the saved data to the Defense Civilian Pay System. On June 7, 1999, the contractor, hired to provide independent assessments to the USD (P&R) of the end-to-end test performed, stated that because DCPDS "has been operational for a long time and Y2K system certified, there appears to be an over confidence that everything will operate satisfactorily in the Year 2000, a situation decreasing the perceived importance of end-to-end testing and code scanning." The Air Force stated that the DCPDS was a batch processing system and that it participated in the end-to-end test in the same manner that the system operated. The only difference was the amount of time that the data was saved. In normal operations, data would be saved for up to 2 weeks before being transmitted. The action officer for the USD(P&R) agreed with the Air Force that the DCPDS had been sufficiently tested and did not require the Air Force to do further tests of the DCPDS.

A more rigorous end-to-end test would have provided DoD with additional assurances that the DCPDS would continue to operate without interference from year 2000 problems. Because of the remaining risk, the effectiveness of the contingency plan for the DCPDS and the results of exercising the contingency

plan become increasingly important. As previously stated, the Inspector General, DoD, will perform an independent review of the effectiveness of Y2K operational contingency plans for DoD personnel systems.

Planning and Executing the End-to-End Tests

The Master Plan generally did not provide the Military Services with specific guidance on how to conduct end-to-end testing. The details were left to the Military Services to incorporate into their Service-level test plan. Therefore, the Master Plan did not provide a standard methodology for the Military Services to follow in documenting the procedures, status, and results of their end-to-end tests. Consequently, the Military Services used various methods to document and track the testing and results. For example, the Army established extensive procedures for recording, verifying, and reporting the test results for each system in the thin threads. The Army also established a test operations center, which monitored the test results and maintained a detailed accounting of the end-to-end test. The test operations center also had onsite representatives at each test to assist in monitoring the test and ensuring the necessary documentation was collected.

The Navy test plan, if followed, addresses the required elements. The test plan describes the critical functions, interfaces, test scenarios, and has procedures for test execution, data analysis, and error recovery. Data flow diagrams and interface listings were descriptive and helpful.

The USD(P&R) made the observation that the Air Force test plan was well written and provided a framework for Y2K testing. However, USD(P&R) was concerned that the Air Force was not following the procedures in its own test plan and that documentation was generally not available. USD(P&R) stated that it appeared testing was being done in an "ad hoc" manner, and test scenarios were being developed as the tests were being conducted. Specifically, the contractor hired by the Office of the USD(P&R) concluded in its preliminary assessment during the end-to-end testing of Air Force critical personnel systems that:

- only a few test scenarios existed and the test documentation was incomplete or did not exist, and
- the Air Force was not aware of the effort required to properly conduct and document Y2K end-to-end testing in order to satisfy due diligence requirements.

The Marine Corps had not developed an overall end-to-end test plan to provide overall guidance and direction on testing its personnel systems and threads. The Marine Corps was developing its overall plan, even though it had almost completed testing of the eight functional areas defined by USD(P&R). Instead of developing an overall end-to-end test plan, the Marine Corps drafted a plan that addresses the functions that remained to be tested. Consequently, for the tests conducted, the Marine Corps was not consistent in documenting the test scenarios, test results, or dates tested. For example, the report prepared by the

contractor for the end-to-end test conducted on the Marine Corps' mobilization thread did not provide any details on the test results. The report stated only that no problem had been encountered during the testing. We did not make a recommendation addressing the development of a standard methodology for documenting the test procedures, status, and results because the Army, Air Force, and Marine Corps had nearly completed their end-to-end testing.

Testing of Critical Dates. The Master Plan states that three calendar date periods specifically affect personnel processing and must be tested. The three calendar date periods are the change over dates of December 31, 1999, to January 1, 2000; February 28, 2000, to February 29, 2000; and February 29, 2000, to March 1, 2000. The Master Plan further stated that the Commanders in Chief operational evaluations had already found failures for all three of those time periods in their testing. Even though the USD(P&R) made the assertion that the dates must be tested in the end-to-end test of personnel systems, the Army and the Marine Corps did not include all the critical test dates in their test efforts. The Army tested two of the three required date periods: December 31, 1999, to January 1, 2000; and February 28, 2000, to February 29, 2000. At an April 30, 1999, planning meeting we attended, the Army indicated that it would only test two of the date periods considered critical in the Master Plan. Representatives of the USD(P&R) did not object to the Army not testing the February 29, 2000, to March 1, 2000. The action officer for the USD(P&R) stated that because the Army had tested the calendar year and leap year change over date periods, the USD(P&R) was not concerned that the Army did not test the February 29, 2000, to March 1, 2000, date period required in the Master Plan. The Marine Corps did not include the leap year date change over period in its end-to-end testing of the mobilization thread. At the instruction of the USD(P&R), the Marine Corps successfully retested the mobilization thread to include the leap year change over date period. The Air Force tested all three critical date changes and the Navy plans to test the three required date periods. We did not make a recommendation addressing the date that the Army and Marine Corps did not test because the Under Secretary of Defense for Personnel and Readiness, subsequent to development of the Master Plan, decided that testing the February 29, 2000, to March 1, 2000, date period was not applicable in the personnel operational batch data processing environment.

Additional Opportunities to Mitigate Risk

There are additional methods that the Military Services can use to reduce the risk of Y2K failure of mission-critical personnel systems, especially those systems that have not been properly exercised in an end-to-end test. These methods include reexamining the interfaces between systems and examining application software through the use of code scanning tools.

Reexamining Interfaces. One risk mitigation method is to reexamine system interface agreements and interface testing to assure that data passed between systems will work correctly. End-to-end testing should ensure the continuity of critical support functions and involve core processes, the system interfaces required, and the flow of data through the interfaces. The exchange of data through the interfaces is critical because they have the potential to

propagate errors from one core process to another. If an organization is unable to participate in an end-to-end test, one way to reduce the risk of losing continuity of critical support functions is to reexamine the critical interfaces and the data exchanged through them. Procedures for reexamining interfaces and data include:

- reviewing the interface strategy with interface partners,
- using test files to simulate the interfaces,
- sharing test files with interface partners so they may conduct their own simulated tests, and
- ensuring, when possible, exchanged year and date fields are four digits.

Because there is a high risk that the Navy may not complete or will have to rush through end-to end testing to complete it in time, we believe that the Navy should perform the interface reexamination procedures.

Scanning Computer Software. Another risk mitigation method is to use Y2K analysis and renovation tools to examine application software for mission-critical personnel systems. DoD has placed emphasis on computer code testing and has purchased software for scanning software for Y2K errors. In an August 11, 1999, memorandum, the Assistant Secretary of Defense (Command, Control, Communications and Intelligence) strongly recommended that every DoD activity perform software maintenance using automated software quality and testing tools to verify the integrity of remediated code. Some DoD organizations had already planned to take the initiative of scanning software code to provide additional assurance that the Y2K risk is reduced. The Y2K action officer for the Army Deputy Chief of Staff for Personnel stated that the Army may perform computer code scanning on its personnel systems. The Air Force has plans to scan its mission-critical personnel and finance systems. The Navy and the Marine Corps do not plan to perform computer code scanning on their systems. The Inspector General, DoD, believes that code scanning should be used aggressively to provide additional assurance that mission-critical systems will be operational in Y2K and beyond, especially when any doubt exists about the executability or rigor of the end-to-end tests. It is advisable that the Navy use a code scanning tool to verify that all mission-critical personnel systems' application software is Y2K compliant since these systems may not complete end-to-end testing.

Conclusion

The USD(P&R) and the Military Services are still conducting, evaluating, and reporting on end-to-end tests for mission-critical personnel systems. It is vitally important that USD(P&R) and the Military Services continue efforts to provide

DoD with a level of confidence that all mission-critical personnel systems will demonstrate operational readiness in Y2K. Of equal importance is the need to take action to mitigate the risk of the:

- Navy not completing end-to-end testing of its personnel systems, and
- Air Force not subjecting the DCPDS to a higher level test.

There is sufficient remaining risk to warrant the Navy and Air Force taking additional risk mitigation measures. Particular attention is needed to make sure that contingency plans are in effect and that the contingency plans have been exercised. In addition, the Navy should examine 100 percent of the application software, through the use of code scanning tools, and use interface reexamination procedures for all mission-critical systems in its personnel functional area.

Recommendation and Management Comments

We recommend that the Deputy Chief of Naval Personnel require that interface reexamination procedures be performed for all Navy mission-critical personnel systems and that advanced automated scanning tools be used to examine all of the application software for those systems.

Navy Comments. The Chief of Naval Personnel, Bureau of Naval Personnel, concurred and stated that the Navy has been continually reviewing the interface strategy with its interface partners and simulating the interfaces thoroughly during the end-to-end testing. The Navy is also using advanced automated scanning tools to examine the application software in the mission-critical personnel systems. The Navy is confident that all end-to-end testing will be completed by the end of October 1999, and that its personnel systems will operate beyond January 1, 2000. For the full text of Navy comments, see the Management Comments section of the report.

Additional Management Comments on the Finding and Audit Responses

Although the report did not make specific recommendations to the Air Force and the Defense Information Systems Agency, they provided comments on the finding. For the full text of Air Force and the Defense Information Systems Agency comments, see the Management Comments section of the report.

Air Force Comments. The Assistant Director, Communications and Information, Air Force Communications and Information Center, disagreed with assertions in the report regarding the effectiveness of the end-to-end test of the DCPDS. The Assistant Director provided extensive detail concerning the comprehensive Y2K test that the Air Force conducted on the interface between the Defense Civilian Personnel Data System and the Defense Civilian Pay System. The Assistant Director also stated the report incorrectly asserted that

the sole reason for conducting the test using the saved test data was to avoid having to replicate the operational hardware to perform the end-to-end test of the system. Although there was an economic benefit, using the saved data permitted the Air Force to replicate the operation of the DCPDS just as it is used in the field and allowed more personnel transactions that affect pay to be processed and tested.

Audit Response. Although the DCPDS completed the system-level test, we maintain that it was not exercised in a separate, higher level test as required by the Defense Management Plan. We agree with the Assistant Director that the data output from DCPDS, the interface between the DCPDS and the Defense Civilian Pay System, and the Defense Civilian Pay System itself were properly tested in the end-to-end test, but the DCPDS was not. Concerning the additional reasons that the Air Force provided for using the saved data, we have modified the report to reflect those additional reasons.

Defense Information Systems Agency Comments. The Inspector General, Defense Information Systems Agency, disagreed with statements in the report that the Navy was late in starting its end-to-end testing because the Defense Information System Agency was unable to provide the necessary platforms, manpower, and services to test the systems. The Inspector General stated that there were several reasons for the late start in the Navy testing and provided information describing the reasons.

Audit Response. We modified the report to include the information that the Inspector General provided concerning the testing delays.

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 DoD Chief Information Officer to monitor DoD efforts to address the year 2000 computing challenge. For a list of audit projects addressing the issue, see the year 2000 web page on the IGnet at <http://www.ignet.gov>.

Scope

We reviewed documentation dated June 1998 to August 1999. The documentation included policies and procedures issued by the USD(P&R) and established for the end-to-end testing of DoD personnel functions. We reviewed and analyzed the Military Services end-to-end test plans and test results for personnel functions. We also reviewed the USD(P&R) initial assessments of the Military Services test plans and test results.

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

Goal 2: 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. **Performance Goal 2.2:** Transform U.S. military forces for the future. (00-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 Management Functional Area. Objective:** Become a mission partner. **Goal:** Serve mission information users as customer. (ITM-1.2)
- **Information Management Functional Area. Objective:** Provide services that satisfy customer information needs. **Goal:** Modernize and integrate Defense information infrastructure. (ITM-2.2)
- **Information Management Functional Area. Objective:** Provide services that satisfy customer information needs. **Goal:** Upgrade technology base. (ITM-2.3)

General Accounting Office High-Risk Area. The General Accounting Office has identified several high-risk areas in the DoD. This report provides coverage of the Information Management and Technology high-risk area.

Methodology

Audit Type, Dates, and Standards. We performed this program audit from April 1999 through July 1999, in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD.

Use of Technical Assistance. We received technical assistance from the Computer Engineers in the Inspector General, DoD, Audit Followup and Technical Support Directorate to obtain assistance with reviewing the sufficiency of test plan and test results.

Use of Computer-Processes Data. We did not use computer-processed data to perform this audit.

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

Management Control Program. We did not review the management control program related to the overall audit objective because DoD recognized the year 2000 computing problem as a material management control weakness 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 year 2000 issues. General Accounting Office reports can be accessed over the Internet at <http://www.gao.gov>. Inspector General, DoD, reports can be accessed at <http://www.dodig.osd.mil>.

Appendix B. Report Distribution

Office of the Secretary of Defense

Under Secretary of Defense (Comptroller)
Deputy Chief Financial Officer
Deputy Comptroller (Program/Budget)
Under Secretary of Defense (Personnel and Readiness)
Assistant Secretary of Defense (Command, Control, Communications and Intelligence)
Deputy Chief Information Office and Deputy Assistant Secretary of Defense (Chief Information Officer Policy and Implementation)
Principal Director for Year 2000
Director, Defense Logistics Studies Information Exchange

Department of the Army

Assistant Secretary of the Army (Financial Management and Comptroller)
Auditor General, Department of the Army
Inspector General, Department of the Army

Department of the Navy

Assistant Secretary of the Navy (Financial Management and Comptroller)
Deputy Chief of Naval Personnel
Auditor General, Department of the Navy
Inspector General, Department of the Navy
Inspector General, Marine Corps

Department of the Air Force

Assistant Secretary of the Air Force (Financial Management and Comptroller)
Deputy Chief of Staff for Personnel
Auditor General, Department of the Air Force
Inspector General, Department of the Air Force

Other Defense Organizations

Director, Defense Contract Audit Agency
Director, Defense Information Systems Agency
Director, Defense Logistics Agency
Director, National Security Agency
Inspector General, National Security Agency
Inspector General, Defense Intelligence Agency

Non-Defense Federal Organizations and Individuals

Office of Management and Budget
Office of Information and Regulatory Affairs
General Accounting Office
National Security and International Affairs Division
Technical Information Center
Director, Defense Information and Financial Management Systems, Accounting and Information Management Division

Congressional Committees and Subcommittees, Chairman and Ranking Minority Member

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
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

Bureau of Naval Personnel Comments



DEPARTMENT OF THE NAVY

BUREAU OF NAVAL PERSONNEL
5720 INTEGRITY DRIVE
MILLINGTON TN 38055-0000

IN REPLY REFER TO
7540
Ser 00K3/1999240
04 Oct 99

From: Chief of Naval Personnel
To: DOD Inspector General

Subj: DRAFT AUDIT REPORT ON END-TO-END TESTING FOR PERSONNEL SYSTEMS
(PROJECT NO. 9AL-0098)

Ref: (a) Subject DODIG ltr of 10 Sep 99

Encl: (1) Response to subject draft report

1. Per reference (a), our response is provided in enclosure (1). If you have any questions, the POC in this office is Mr. Richard Cosgrove at Comm 901-874-3034 (DSN 882).

A handwritten signature in cursive script, appearing to read "D.M. Cashbaugh".

D.M. CASHBAUGH
By direction

Copy to:
ASN (M&RA)
EMO-31
DON CIO
CHNAVPERS
CNO (N1B)
NAVPERSCOM (PERS-00, 07)
NRISO

Navy Comments
on
OAI(A) Draft Report of 10 September 1999
On
End-to-End Testing for Personnel Systems
Project No. 99N-0098

Summary of OAI(A) Findings, Conclusions and Recommendations

"By not being able to start its end-to-end testing until September 1999, the Navy may not have sufficient time to complete the testing, evaluate the test results, resolve Y2K issues that might be encountered, and retest, if necessary."

Summary of the Navy Position

Navy started End-to-End testing on 4 September 1999 completing active duty testing with no Y2K related errors on 20 September 1999, and is on schedule to complete all testing by the end of October 1999. Navy is confident that all end-to-end testing will be successfully completed within the time constraints and personnel systems will operate beyond 1 January 2000.

OAI(A) Recommendation: "We recommend that the Deputy Chief Of Staff of Navy Personnel require that interface reexamination procedures be performed for all Navy mission-critical personnel systems and that advanced automated scanning tools be used to examine 100 percent of the application software for those systems."

Navy Management Response: Concur.

1. Code Scanning - Navy mission-critical personnel systems are being examined with the advance automated scanning tools.
2. Interface Testing -
 - a) The Navy has completed all of the active duty E2E test strings (accession, retirement, locate, mobilization active duty gain, and deployment) with no Y2K related errors discovered. Pay transactions from testing were passed to DFAS on 17 September 1999. Results are pending.
 - b) Navy Personnel systems E2E remain on schedule. Casualty Management Testing is scheduled for 2 October 1999. Followed by OSD Reserve E2E testing scheduled for the week of 11 October 1999.
 - c) The procedure listed for reexamining interfaces is extremely time-consuming, manpower intensive, and requires a massive coordination effort. Incremental interface testing which was completed was also considered as a strategy instead of OSD E2E testing. However, after careful review, OSD (P&R) considered it a non-viable option to replace E2E testing.

Encl (1)

d) Specific comments regarding interface testing procedure listed in the draft report are addressed below:

- (1) The system interface approach referred to in part one has been tested continually.
- (2) Parts 2 and 3 of the procedure are component parts of E2E testing and are being thoroughly exercised during Navy E2E testing.
- (3) Ensuring four-digit year fields (part 4) as part of the basic strategy employed in the renovation of code. The Navy adopted the windowing techniques that support the two-digit year fields to enable completion of the code renovation in a timely manner. Where practical, four digit field years were incorporated.

OAIG Comments From Page 6:

"The USD(P&R) has expressed concerns regarding the Navy ability to complete end-to-end testing of its personnel systems within the timeframe established. The USD(P&R) concerns related to the possible lack of Navy financial resources to accomplish the required testing and lack of the Bureau of Naval Personnel system documentation and institutional knowledge."

Response:

Through intense scrutiny and reprogramming, funding has been identified to accomplish the required testing. Internal reorganizations within BUPERS and the BRAC move to Millington did reduce the numbers of valuable people with in-depth business knowledge of the Navy personnel systems. Together BUPERS, WRISO and supporting contractors developed training plans, formed teams of functional/technical personnel to acquire the in-depth knowledge required to renovate, certify and test Navy personnel systems. Much of the business and process knowledge has been regained and Navy E2E testing is on schedule for completion by 31 October.

OAIG Comments from Page 6:

"Additional risk mitigation measures are needed and the USD(P&R) needs to be aware of the results of the actions taken. One such measure would be an independent review of the contingency plans and the results of exercising the contingency plans for the personnel systems in the Navy."

Response:

Navy has developed a draft Operational COOP that supports the OSD defined mission critical areas. This plan was briefed to DOD IG on 20 September 1999 as part of their review of COOP and Contingency plans in support of Y2K. Navy intends to hold a roundtable test of all components of the COOP by 1 November 1999. Results and updates from tests will be reported as required.

Encl (1)

Department of the Air Force Comments



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE COMMUNICATIONS AND
INFORMATION CENTER

28 SEP 1999

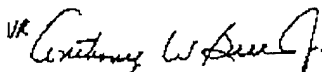
MEMORANDUM FOR ASSISTANT INSPECTOR GENERAL FOR AUDITING
OFFICE OF THE INSPECTOR GENERAL
DEPARTMENT OF DEFENSE

FROM: HQ USAF/SC
1250 Air Force Pentagon
Washington DC 20330-1250

SUBJECT: Draft Audit Report on End-to-End Testing for Personnel Systems, 10 Sep 1999
(Project No 9AL-0098)

This is in reply to your memorandum requesting the Assistant Secretary of the Air Force (Financial Management and Comptroller) to provide Air Force comments on subject report

While you did not make specific recommendations for the AF, we disagree with your assertions regarding the effectiveness of the end-to-end test of the Defense Civilian Personnel Data System. Air Force comments are attached. Our point of contact is Maj Callahan, Air Force Year 2000 Office (AFY2KO). He can be reached at DSN 333-2225 or 703/602-2225.


ANTHONY W. BELL, JR., Brig Gen, USAF
Assistant Director, Communications and Information

Attachment:
Air Force Comments

cc:
AF CIO

**Air Force Comments On Draft DoDIG Audit Report
(Project No. 9AL-0098), End-to-End Testing for Personnel Systems**

GENERAL AF COMMENTS. The report focuses on testing performed between 5 and 28 May 1999 and does not accurately reflect the facts concerning the Y2K end-to-end test conducted by the Air Force Personnel Center (AFPC). Testing occurred from 5 May through 17 Sep 1999 to ensure all critical functional areas/transactions were fully tested. To date, more than 500,000 of 642,000 lines of AF personnel system's code have been scanned without identifying a single, confirmed problem that would have prevented AF personnel systems from operating in the year 2000.

SPECIFIC COMMENTS.

1. DoDIG, Executive Summary, "Results", paragraph 2. "The Air Force end-to-end test involving the Defense Civilian Personnel Data System was not rigorous by the criteria set forth in DOD Year 2000 Management Plan."

2. DoDIG, Page 3, "End-to-End Testing of Personnel Systems", paragraph 1, "Also, the Air Force end-to-end test involving the Defense Civilian Personnel Data System was not as rigorous as required by the criteria set forth in DOD Management Plan. Instead the Air Force chose to use test data that it saved from the system certification test of the Defense Civilian Personnel System. As a result, additional risk mitigation procedures such as independent reviews of contingency plans, reexamination of interfaces, and the use of code scanning tools on application software are warranted."

3. DoDIG, Page 7, "Use of System Level Test Results for End-to-End Testing", paragraph 1. "The Air Force end-to-end test involving the DCPDS was not as rigorous as required by the criteria set forth in DOD Management Plan." "The DCPDS did complete the system level test but was not exercised in a separate, higher level test as required by the Defense Management Plan." "Instead of including DCPDS in the end-to-end test, the Air Force chose to use test data that it saved from the system certification test of the DCPDS for its end-to-end testing." "The data from the DCPDS was properly passed to other systems; therefore, the interfaces between those systems were properly tested. However, the Air Force did not retest input and processing by the DCPDS during the end-to-end test." "The participation of the DCPDS in the end-to-end test merely consisted of the DCPDS passing the saved data to the Defense Civilian Pay System."

AF COMMENTS. Nonconcur. The report alleges that the AF Y2K interface test between the Defense Civilian Personnel Data System (DCPDS) and the Defense Civilian Pay System (DCPS) was not as rigorous as that required by the criteria set forth in the DoD Management Plan. The Defense Civilian Personnel Management Service (CPMS) conducted a comprehensive Y2K interface test that consisted of using test data generated from processing virtually all of the several hundred types of personnel actions approved by the Federal Office of Personnel Management. The test data was generated during the Y2K Personnel functional test of the legacy DCPDS conducted from November to December 1998. The test data corresponded to approximately 2600 different

Final Report
Reference

combinations of personnel actions representing several DoD components. DCPDS testers saved this data in the same manner replicating field operations. The test data was then transmitted from DCPDS to DCPS. The DCPDS output test data was not altered in any manner before it was transmitted to DCPS. DCPS validated that test data, created its history files from the first batch, and then processed the test data in the same manner as in actual operations. DCPS then transmitted the reverse, reject, and reconciliation files covering each of the critical pay periods in batch mode back to DCPDS for validation and further processing in the same manner replicating field operations. The report acknowledges that a USD(P&R) action officer "agreed with the AF that the DCPDS had been sufficiently tested and did not require the Air Force to do further tests of the DCPDS."

All critical Y2K midnight crossing dates encompassing all pay periods from late December 1999 through April 2000 were used in the personnel actions that were processed for the Y2K interface test. The Y2K end-to-end test described above was comprehensive and exceeded the requirements set forth in the DoD Management Plan. Plans were closely followed for the Y2K interface test between the DCPDS and DCPS that was based on the DoD Management Plan.

Revised

4 DoDIG. Page 7, "Use of System Level Test Results for End-to-End Testing", paragraph 1. "The Air Force stated that by using the saved data it was able to save \$2.3 million by eliminating the need to replicate the DCPDS hardware for the end-to-end test."

AF COMMENTS. Nonconcur. The report incorrectly asserts that our sole reason for conducting the Y2K end-to-end test in this manner was to avoid having to replicate the operational hardware to perform the end-to-end test of the systems. While there was an economic benefit to using saved test data, it was not the sole or primary reason for our use of saved test data. Saved test data was used to replicate the operation of the DCPDS just as it is used in the field. Use of the test data allowed more transactions to be processed thereby testing more personnel transactions that affect pay. Test procedures were completely justified on the basis that any variation of the DCPDS operation during this test would compromise the correct manner of conducting the Y2K end-to-end test between the DCPDS and DCPS. In actual field operations, the output data generated by the personnel actions processed with the DCPDS must be saved by the personnel office, and then transmitted in batch mode to DCPS for subsequent payroll actions effective within the current pay period. This data is not transmitted piecemeal to DCPS for each personnel action processed; therefore, all actions are batched and flowed to DCPS.

5. DoDIG. Page 8, "Planning and Executing the End-to-End Tests", paragraph 3. "The USD(P&R) made the observation that the Air Force test plan was well written and provided a framework for Y2K testing. However, USD(P&R) was concerned that the Air Force was not following the procedures in its own test plan and that documentation was generally not available."

AF COMMENTS: Nonconcur (Military Personnel System). The test plan remained in draft purposely to allow the month of May '99 for internal evaluation of the limited test

effort and determination of the most appropriate forms of documentation for the record. Modified test procedures in June included standardized test tools and procedures that were followed for the remainder of the test.

6. DoDIG, Page 8, "Planning and Executing the End-to-End Tests", paragraph 3. "USD(P&R) stated that it appeared testing was being done in an "ad hoc" manner, and test scenarios were being developed as the tests were being conducted."

AF COMMENTS: Nonconcur (Military Personnel System). The test plan laid out high-level functional processes from within which the functional OPRs were to test. All eight critical functions within the personnel area identified by USD(P&R) were used in the test: Access, Mobilize, Deploy, Locate, Pay, Separate, Retire, and Casualty Support. Each functional area had a finite number of scenario options available. Assignments, for example, could initiate, change, or cancel an assignment. The daily test "scenarios" were essentially limited to the records themselves and Y2K critical test dates associated with each transaction. Each OPR presented their daily "scenario" from which the test transactions were input. The following duty day the output was analyzed with the appropriate data systems expert and certified by both. All necessary documentation is available to support each day's testing.

7. DoDIG, Page 8, "Planning and Executing the End-to-End Tests", paragraph 3. "Specifically, the contractor hired by the Office of the USD(P&R) concluded in its preliminary assessment during the end-to-end testing of Air Force critical personnel systems that:

- only a few test scenarios existed and the test documentation was incomplete or did not exist."

AF COMMENT: Nonconcur. See comment above.

- "the Air Force was not aware of the effort required to properly conduct and document Y2K end-to-end testing in order to satisfy due diligence requirements."

AF COMMENTS: Nonconcur (Military Personnel System). The testing staff was fully aware of the effort required to satisfy the due diligence requirements and was working to that end. This draft audit report cites observations applying to the first three weeks of an ultimate five-month test period. From June through September, AFPC tests included 18 functional OPRs generating daily test transactions involving an average of over 1,600 individual transactions, using 110 transaction types, within eight different functional areas across the military lifecycle. Over 135,000 total transactions were generated during this four-month test period. From 18-20 August, a representative from USD(P&R) and his third-party contract auditor interviewed our functional OPRs as well as PDS testing staff members for all testing accomplished from 1 June through their visit.

8. DoDIG, Page 10 and 11 "Conclusion". "Of equal importance is the need to take action to mitigate the risk of the:

- Air Force not subjecting the DCPDS to a higher level test.

AF COMMENTS: Nonconcur. The Y2K end-to-end test described in this report was comprehensive and exceeded the requirements set forth in the DoD Management Plan.

Defense Information Systems Agency Comments



DEFENSE INFORMATION SYSTEMS AGENCY
705 COURTHOUSE ROAD
ARLINGTON, VIRGINIA 22204-2100

IN REPLY
REF ID: A66510

Inspector General '10'

29 September 1989

MEMORANDUM FOR INSPECTOR GENERAL, DEPARTMENT OF DEFENSE
(ATTN: ACQUISITION MANAGEMENT DIRECTORATE)

SUBJECT: RESPONSE TO DOD IG DRAFT REPORT, "AUDIT REPORT
ON END-TO-END TESTING FOR PERSONNEL SYSTEMS
(PROJECT #9AL-0098)

1. The attached enclosure is the official DISA response to the subject draft report. The DISA comments were forwarded electronically on 14 September 1989.
2. If you have any questions, please call Ms. Teddie Lou Steiner, Audit Liaison, at (703) 607-6316.

RICHARD T. RICE
Inspector General

Enclosure a/s

Quality Information for a Strong Defense

Final Report
Reference

**DISA WESTHEM Response to DoD Inspector General Audit # 9AL-0098
End-to-End Testing for Navy Personnel Systems**

Note: WESTHEM Comments are informational only. Report contains no recommendations.

Revised

Executive Summary, page 1 and page 3, Report statement:

However, the Navy did not plan to begin its end-to-end testing until September 1999 because the Defense Information Systems Agency was unable to provide the Navy the platforms it needed to test system compliance in accordance with the Year 2000 system certification process.

Revised

And Page 5, Report statement.

The delay in starting the testing occurred because the Defense Information Systems Agency was unable to provide the necessary platforms, manpower and services to enable the Navy mission-critical systems to be tested in accordance with the Year 2000 system certification process. Further complicating matters, the Defense Information Systems Agency was also contemplating moving the test site from Chambersburg, Pennsylvania to Columbus, Ohio.

DISA WESTHEM Comments:

WESTHEM strongly non-concurs with this assessment. These statements do not clearly represent the facts as they exist and could lead to confusion on the part of the readership of this document. The following information is provided to clarify the facts.

The Naval Reserve Information Systems Office (NRISO) identified in writing their requirements for the support of their Year 2000 Testing (Y2K) in Sep 98. This occurred while Defense Megacenter Chambersburg (DMC Chambersburg) was in the process of converting all of its customers to the IBM Operating System OS/390. Based on the 1997 Quadrennial Defense Review, DMC Chambersburg was also undergoing a down-sizing effort. This down-sizing effort originally scheduled all DMC Chambersburg mainframe processing to be moved to other Defense Megacenters by Sep 98. As a result of this down-sizing, DMC Chambersburg began to lose technical personnel.

Initial analysis of the requirements to support NRISO's Y2K Level I testing identified the approximate cost would be in the 9-12 million-dollar range. Upon review of NRISO's requirements, it was determined that DMC Chambersburg lacked sufficient hardware and personnel resources to meet their need. NRISO and DISA personnel worked hand-in-hand to further refine the requirement, and as a result were able to get the overall cost for NRISO's Y2K Level I testing down to approximately 1.7 million dollars. Additionally, in order to allow NRISO to meet its aggressive remediation and testing schedule, it was also agreed by both DISA and NRISO to not migrate the personnel workload until CY00. The costs and requirements for Level I testing were identified and

negotiated with NRISO and finalized in a Memorandum of Agreement (MOA) between NRISO and DMC Chambersburg, signed 15 Sep 98

It should be noted there were no requirements for Level II End-to-End testing identified in this MOA

To support NRISO Level I testing, the hardware contract was in place on 23 Oct 98 and the equipment was delivered 9 Nov 98. The personnel contract was in place 24 Nov 98. While the contracting efforts were ongoing, NRISO and DMC Chambersburg coordinated the schedule and actions required to make the system available for remediation and testing. The two parties agreed to an availability date of 31 Jan 99. This date was met and the system was provided to NRISO for their testing.

NRISO developed a schedule that called for completion of all remediation work, application testing in a rolled-forward systems environment and subsequent retrofit back to their production systems by 16 Aug 99. All of this work was completed on schedule.

During the remediation period NRISO identified the need to conduct Y2K Level II End-to-End testing. The new requirements for Level II testing mirrored the hardware, software, and personnel requirements that were allocated and made available for the Level I remediation and testing. A new Level II End-to-End testing agreement was signed between DMC Chambersburg and NRISO on 27 Apr 99. However, End-to-End testing could not commence until the Navy accepted as satisfactory the results of NRISO's Level I Y2K tested applications. These applications were subsequently accepted and NRISO began Level II End-to-End testing on 13 Sep 99.

NRISO has successfully completed the Year End and Leap Year 2000 rollovers and continues to meet planned testing schedules through the concerted efforts of themselves and DMC Chambersburg. The completion of the current End-to-End Level II testing is scheduled to end 17 Oct 99. This will provide the most comprehensive validation of Y2K compliancy of the Navy personnel applications. DISA stands ready to continue to support the NRISO Y2K validation efforts with the same degree of efficiency and responsiveness demonstrated by the accomplishments to date.

The Inspector General Report statements annotated above leads the reader to believe that DISA was unable to support the Navy Y2K test requirements. As can be seen here in the description of events DISA responded to and met the late breaking and ever changing requirements for NRISO's Y2K Level I and Level II testing in a timely manner.

Audit Team Members

The Acquisition Management Directorate, Office of the Assistant Inspector General for Auditing, DoD, prepared this report.

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INTERNET DOCUMENT INFORMATION FORM

A . Report Title: End-To-End Testing for Personnel Systems

B. DATE Report Downloaded From the Internet: 02/08/99

**C. Report's Point of Contact: (Name, Organization, Address, Office
Symbol, & Ph #):** OAIG-AUD (ATTN: AFTS Audit Suggestions)
Inspector General, Department of Defense
400 Army Navy Drive (Room 801)
Arlington, VA 22202-2884

D. Currently Applicable Classification Level: Unclassified

E. Distribution Statement A: Approved for Public Release

**F. The foregoing information was compiled and provided by:
DTIC-OCA, Initials: __VM__ Preparation Date 02/08/99**

The foregoing information should exactly correspond to the Title, Report Number, and the Date on the accompanying report document. If there are mismatches, or other questions, contact the above OCA Representative for resolution.