Audit Report

DATA RELIABILITY ASSESSMENT REVIEW OF
win.COMPARE^2 SOFTWARE

Report No. D-2001-127 May 23, 2001

Office of the Inspector General
Department of Defense

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Acronyms

AFMIA	Air Force Manpower Innovation Agency
DFARS	Defense Federal Acquisition Regulation Supplement
DITSCAP	Defense Information Technology Security Certification and Accreditation Process
DUSD(I)	Deputy Under Secretary of Defense (Installations)
OMB	Office of Management and Budget
OSD	Office of the Secretary of Defense

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
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May 23, 2001

MEMORANDUM FOR DEPUTY UNDER SECRETARY DEFENSE FOR INSTALLATIONS

SUBJECT: Audit Report on Data Reliability Assessment Review of win.COMPARE[2] Software (Report No. D-2001-127)

We are providing this report for your information and use. We conducted the audit in response to a request from the Director, Competitive Sourcing and Privatization, Deputy Under Secretary of Defense (Installations). No written response to this report was required, and none was received. Therefore, we are publishing this report in final form.

We appreciate the courtesies extended to the audit staff. For additional information on this report, please contact Mr. Garold E. Stephenson at (703) 604-9332 (DSN 664-9332) (gstephenson@dodig.osd.mil) or Mr. Kent E. Shaw at (703) 604-9228 (DSN 664-9228) (kshaw@dodig.osd.mil). See Appendix B for the report distribution. The audit team members are listed inside the back cover.

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Acting Assistant Inspector General
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cc: Assistant Secretary of the Air Force
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Office of the Inspector General, DoD

Report No. D-2001-127 **May 23, 2001**
(Project No. D2000CH-0076.001)

Data Reliability Assessment Review of win.COMPARE^2 Software

Executive Summary

Introduction. The audit was requested on June 23, 2000, by the Director, Competitive Sourcing and Privatization, Deputy Under Secretary of Defense for Installations. The win.COMPARE^2 is a windows-based personal computer application developed by a contractor hired by the Air Force Manpower Innovation Agency, Randolph Air Force Base, Texas, to perform cost comparisons required by the Office of Management and Budget Circular A-76 Revised Supplemental Handbook. The win.COMPARE^2 software was designed to replace a Disk Operating System-based version of the software called COMPARE that was developed by the Air Force Management Engineering Agency in 1994.

Objectives. The overall objective was to perform a reliability assessment of the win.COMPARE^2 software. The specific objectives were to assess the general and application controls, and through software testing, determine whether computations were sufficiently reliable, accurate, and in accordance with Office of the Secretary of Defense and Office of Management and Budget guidance. The audit also assessed the Government's data rights in the software.

Results. We concluded that general and application controls over the software were adequate. We determined, through software testing, that computations and reports generated by win.COMPARE^2 were sufficiently reliable, accurate, and in accordance with the Office of Management and Budget Circular A-76 Revised Supplemental Handbook and the DoD A-76 Costing Manual. We also determined that the Government's data rights in the software were sufficient. For details of the audit results, see the Finding section of the report.

Management Comments. We provided a draft of this report on May 9, 2001. No written response to this report was required, and none was received. Therefore, we are publishing this report in final form.

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Background

The audit was requested on June 23, 2000, by the, Director, Competitive Sourcing and Privatization, Deputy Under Secretary of Defense for Installations (DUSD[I]). The win.COMPARE^2 is a windows-based personal computer application developed by a contractor for the Air Force Manpower Innovation Agency (AFMIA), Randolph Air Force Base, Texas. The computer program aids in the performance of cost comparison studies required by the Office of Management and Budget (OMB) Circular A-76 Revised Supplemental Handbook, "Performance of Commercial Activities," March 1996 (OMB A-76 Revised Supplemental Handbook). The win.COMPARE^2 software was designed to replace the Air Force Management Engineering Agency 1994 Disk Operating System-based version of the Commercial Activities Cost Comparison System named COMPARE. The COMPARE program was initially developed exclusively for the Air Force, but was widely distributed outside the Air Force. The DUSD(I) mandated COMPARE use for all DoD A-76 cost comparisons February 29, 2000, to ensure a standardized approach for the process. The DUSD(I) released the win.COMPARE^2, version 1.0, March 13, 2001. DoD components are mandated to use the computer program in all FY 2001 A-76 cost comparisons. In addition, the computer program is also mandated for use for cost comparisons where in-house cost estimates will be provided to the independent review officials after April 15, 2001.

Requirements and Guidance for Performing OMB A-76 Studies. OMB Circular A-76, "Performance of Commercial Activities," August 4, 1983, establishes the Government-wide policy and process for determining whether commercial activities should be contracted out or performed in-house. The OMB Circular A-76 Revised Supplemental Handbook, March 1996, provides detailed guidance on how and when cost comparison studies are to be performed, and the costs to include in the comparison of in-house and contractor cost proposals. The DUSD(I) released DoD 4100.XX-M, "A-76 Costing Manual," March 13, 2001, as interim guidance pending issuance as a formal DoD publication. The A-76 Costing Manual was designed for use in conjunction with the win.COMPARE^2 software to ensure consistency in DoD competitions. The DUSD(I) also has a "Share A-76!," Internet web site that assists users preparing OMB A-76 comparison studies.

Development of win.COMPARE^2. The Air Force COMPARE software became incompatible with the modern Windows operating system. The Air Force software had limited upgrade and support capabilities, printing problems, limited usage to a single location, and single function cost comparisons. With approval and funding from the DUSD(I), the Air Force contracted with MEVATEC Corporation of Huntsville, Alabama, on March 8, 2000, to update, maintain, and provide testing and training for win.COMPARE^2 software. MEVATEC used previously developed Cascade software under a contract for the Defense Finance and Accounting Service as a starting point to develop the win.COMPARE^2 software. The new software was named win.COMPARE^2 to distinguish it from the prior version.

The win.COMPARE^2 software is easy to use and features multilocation, multifunction studies capabilities. The software is written in Visual Basic for Applications for Microsoft Access 97 and consists of almost 57,000 lines of code, 143 tables, 24 program modules, and 375 reports. The software is distributed as a Microsoft

Access MDE file (called an MDE file because of the MDE file extension), which does not require Microsoft Access 97 installation. The MDE file is a compiled version of the software, which removes all editable source code and compacts the database for improved performance. The win.COMPARE^2 software can be downloaded from the Share A-76! Internet web site.

Objectives

The overall objective was to perform a reliability assessment of the win.COMPARE^2 software. The specific objectives were to assess the general and application controls, and through software testing, determine whether computations were sufficiently reliable, accurate, and in accordance with OSD and OMB guidance. We also assessed the Government's data rights in the software. See Appendix A for a discussion of the audit scope and methodology and prior coverage.

Software Reliability and Data Rights

The general and application controls for win.COMPARE^2, version 1.0, that was released March 13, 2001, were generally adequate. The win.COMPARE^2 generated computations and reports were sufficiently reliable, accurate, and in accordance with the OMB A-76 Revised Supplemental Handbook and the DoD A-76 Costing Manual. Also, the Government's data rights in the software were sufficient.

General and Application Controls

Tests Performed. We tested general and application controls to ensure that win.COMPARE^2 complied with the following requirements.

- Software was year 2000 compliant in all its computations.
- All data tables were current and conformed to the OMB A-76 Revised Supplemental Handbook and subsequent OMB transmittal memorandums or had been approved by OMB.
- Reports generated by win.COMPARE^2 conformed to the requirements of DoD 5400.7-R, "DoD Freedom of Information Act Program," September, 1998.
- Report formats and methodologies used in win.COMPARE^2 complied with the OMB A-76 Revised Supplemental Handbook, and the DoD A-76 Costing Manual.
- Controls over the program's source code were adequate to preclude user modifications to the software.
- Password schemes were adequate to preclude unauthorized changes to the data.
- The security accreditation process had been performed as outlined in DoD 5200.40, "DoD Information Technology Security Certification and Accreditation Process (DITSCAP)," December 30, 1997.
- Software documentation and user manuals were adequate.
- Independent software testing was completed by AFMIA.

Our initial testing identified problems with year 2000 compliance, currency of data tables, and report markings. These problems were brought to the attention of AFMIA and the contractor, however, they were corrected before the final release of the software.

The AFMIA had initiated the security accreditation required by DoD for win.COMPARE^2, but the accreditation was still pending as of the date of this report. Because a designated approval authority for security accreditation has not been determined, users and Information System Security officers of the stand-alone system along with required interface download connections should ensure that appropriate safeguards are in place. Until the accreditation process is complete, users should avoid using the win.COMPARE^2 software in a network environment.

Additional Testing Requirements. Because, win.COMPARE^2 is intended for use in a stand-alone mode, we did not operationally test the program in a network environment and did not evaluate compliance with C-2 level (sensitive, noncritical) security requirements of DoD 5200.28-STD, "Trusted Computer System Evaluation Criteria." Because, OMB A-76 studies are procurement sensitive, C-2 level security would be required if win.COMPARE^2 data was shared over a network. We also did not test for compliance with section 508, "Electronic and Information Technology," of the Rehabilitation Act of 1973 (Public Law 93-112) (amended by Workforce Investment Act of 1998 (Public Law 105-220), section 408(b)). Section 508 requires Federal agencies to ensure comparable access to disabled federal employees to the agency's electronic and information technology, to include software.

Data Testing

Data Testing Approach. Accuracy in win.COMPARE^2 software is critical to a fair evaluation of Government and contractor proposals. We tested computations for each of the 18 lines of cost information identified in chapters 2 through 4 of the OMB A-76 Revised Supplemental Handbook. We also tested computations for the 14 lines of cost information used for Streamlined A-76 Cost Comparisons in chapter 5. Our tests compared calculations from win.COMPARE^2 with expected results that we had either manually calculated or derived from spreadsheets. We attempted to test each line using each of the options available to the user. Additionally, a computer software engineer evaluated the software code for logic errors and computational precision.

Other Testing by AFMIA and the Contractor. Our testing was independent of software testing performed by AFMIA. The AFMIA testing identified a number of problems in earlier versions of the software that were subsequently fixed. The AFMIA testing also included a comparison of results between the old COMPARE software and win.COMPARE^2 when such comparisons were possible. This testing was very beneficial and improved the quality of the final product. Additionally, MEVATEC Corporation conducted its own testing, as part of its quality control program, which was most helpful in fixing problems that were identified.

Results of Data Testing. Our testing identified a number of errors and software glitches that were immediately brought to the attention of the contracting officer representative. We recommended revised algorithms for computing inflation for nonpay items, and conformance with OSD and OMB guidance. We recommended programming approaches that resulted in more precise cost computations. We identified errors with calculations involving leap years and all of the problems were subsequently fixed. We concluded that computations and reports generated by win.COMPARE^2 were sufficiently reliable, accurate, and in accordance with the OMB A-76 Revised Supplemental Handbook and the DoD A-76 Costing Manual.

Testing and Study Limitations. We could not test all possible scenarios, therefore, our review cannot assure that win.COMPARE^2 is error-free. Additionally, a successful cost comparison study depends on the qualifications

and skills of the cost analyst supplying the data to win.COMPARE^2. The analyst must fully understand the OSD and OMB requirements for conducting an A-76 cost comparison, and the cost implications of each win.COMPARE^2 data entry. Likewise, the study quality is also dependent on the diligence of the independent review official.

Data Rights in the Software

The Director, Competitive Sourcing and Privatization, DUSD(I), also requested that we review the Air Force's contract for the development of win.COMPARE^2 to determine whether the Government had adequately protected its data rights in the software.

The Defense Federal Acquisition Regulation Supplement (DFARS) 227.400 directs that DoD use the guidance in DFARS Subparts 227.71 and 227.72 rather than the Federal Acquisition Regulation subpart 27.4 (rights in data and software) because of certain provisions in 10 U.S.C. 2320, "Rights in technical data," and 10 U.S.C. 2321, "Validation of proprietary data restrictions," which apply particularly to DoD. The DFARS subparts 227.71 and 227.72, prescribe the use of standard contract provisions and clauses for protection of technical data and computer software. Some of those clauses are designed to protect the rights of contractors that have developed items, components, or processes at private expense. Other clauses require the contractor to identify any technical data or computer software that it intends to deliver with other than unlimited rights, under any Government contract. These disclosures ensure contracting officers do not obtain lesser rights than those previously provided to the government.

Because the contract for win.COMPARE^2 was a General Services Administration contract, the standard provisions and clauses prescribed by the DFARS had not been used. Nevertheless, MEVATEC contract clause C.3.7, "Code Ownership," provides that the win.COMPARE^2 program shall become the property of the Government to include title and all rights. Additionally, the clause requires all source code, documentation to support the code, engineering notes, training materials, and any other supporting data shall be surrendered to the contracting officer representative. We concluded that this clause adequately protected the Government's ownership rights.

Appendix A. Audit Process

Scope and Methodology

Work Performed. The audit used General Accounting Office, GAO/OP-8.1.3, "Assessing the Reliability of Computer-Processed Data," April 1991, as a guideline for performing a systems review of the software. A systems review assesses and tests all controls in a computer system for the full range of its application functions and products to include:

- an examination of a computer system's general and application controls,
- tests whether those controls are being complied with, and
- tests of data produced by the system.

Accordingly, we reviewed the general and application controls as well as data testing to make our assessment. General controls include organization and management controls, security controls, and system software and hardware controls. Application controls are methods and procedures designed for each application to ensure the authority of data origination, the accuracy of data input, integrity of processing, and verification and distribution of output. Data testing is required to determine whether particular data produced by a computer system are valid and reliable.

We participated in beta testing of the win.COMPARE^2 software at Randolph Air Force Base in San Antonio, Texas, and reviewed the software at MEVATEC headquarters in Huntsville, Alabama. We analyzed the general controls of the win.COMPARE^2 program including compliance with the Defense Information Technology Security Certification and Accreditation Process (DITSCAP) security requirements; compliance with OMB A-76 Revised Supplemental Handbook and related Transmittal Memorandums; and compliance with "For Official Use Only," marking requirements. Our analysis of application controls included testing of edit checks, reliability of data, password controls, and accuracy of computations. We performed data testing on data outputs from win.COMPARE^2. We met with the MEVATEC director and program analyst to discuss issues found during the testing. We met with a Personnel Management Specialist from the DoD Nonappropriated Fund Personnel Policy Office of the Defense Civilian Personnel Management Service to discuss costing policies for nonappropriated personnel.

Limitations to Scope. We did not review the management control program because the scope of the audit was limited to certifying the software and determining whether the Government had adequately protected its data rights to the software.

DoD-Wide Corporate-Level Government Performance and Results Act (GPRA) Coverage. In response to the GPRA, the Secretary of Defense annually establishes DoD-wide corporate level goals, subordinate performance goals, and performance measures. This report pertains to achievement of the following objectives and goals, subordinate performance goal, and performance measure.

- **FY 2001 DoD Corporate-Level 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. **(01-DoD-02)**

- **FY 2001 Subordinate Performance Goal 2.3:** Streamline the DoD infrastructure by redesigning the Department's support structure and pursuing business practice reforms. **(01-DoD-2.3)**

- **FY 2001 Performance Measure 2.3.3:** Public/Private Sector Competitions.

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.

Use of Computer-Processed Data. The audit objective was to assess the reliability of data and the general and application controls of win.COMPARE^2. As a result of the testing we found the data to be reliable and the controls to be adequate.

Use of Technical Assistance. A software computer engineer from the Technical Assessment Division, Audit Followup and Technical Support Directorate, Office of the Assistant Inspector General for Auditing, DoD, provided assistance in the review of the program and system characteristics for accuracy, information assurance and compliance. This review included inspecting operating system features, source code, algorithms, data elements, computer security issues and ensuring program compliance with DoD Automated Information System Policy. The audit performed extensive testing of the win.COMPARE^2 software, in accordance with General Accounting Office guidelines and concluded that win.COMPARE^2 was sufficiently reliable to be used for OMB A-76 cost comparison studies.

Audit Type, Dates, and Standards. We performed this program audit from July 2000 through March 2001 according to auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD.

Contacts During the Audit. We visited and contracted individuals and organizations within DoD, the OMB, and MEVATEC Corporation located in Huntsville, Alabama. Further details are available upon request.

Prior Coverage

During the last 5 years, the Inspector General, DoD, issued one report pertaining to development of another OMB A-76 costing model, which was subsequently terminated. Army Audit Agency issued two reports on the previous COMPARE software. The first audit, Report No. WR95-753, concluded that the COMPARE software would meet the Army's needs. The second audit reviewed the effect of changes made to the COMPARE software by the Air Force.

Inspector General, DoD

Inspector General, DoD, Report No. 99-208, "Defense Finance and Accounting Service Commercial Activities Program," July 8, 1999.

Army

Army Audit Agency Report No. AA97-092, "USAF Commercial Activities Cost Comparison System," January 6, 1997.

Army Audit Agency Report No. WR95-753, "Review of US Air Force Cost Comparison System," December 14, 1994.

Appendix B. Report Distribution

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  - Director, Competitive Sourcing and Privatization

Under Secretary of Defense (Comptroller)
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House Subcommittee on National Security, Veterans Affairs, and International Relations, Committee on Government Reform
House Subcommittee on Technology and Procurement Policy, Committee on Government Reform

Audit Team Members

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