

**Federal Audit
Executive Council Committee
"Auditing in a Paperless Environment"**

Automating the Audit Work Paper Process

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I am delighted to endorse the Auditing in a Paperless Environment Committee's guide for automating the audit work paper process.

The Federal Audit Executives Council is composed of the Assistant Inspectors General for Audit from all Federal agencies with statutory Inspectors General, plus the Director, Defense Contract Audit Agency, and the Auditors General of the Military Departments. Two years ago, the Council asked me to organize and mentor a series of information exchanges and cooperative research efforts on Auditing in a Paperless Environment. It has been gratifying to see the enthusiasm and determination with which the Federal audit community is stepping up to the challenges posed by this era of rapidly evolving technology and professional practices.

As we find ourselves becoming more dependent upon automated technologies, we must accept the challenge to enhance audit integrity and efficiency using automation. This guide identifies standards agencies can use, illustrates how three agencies used the standards in their selection process, and provides contacts for a support network. I am pleased to see this timely addition to the practical literature available to Federal auditors on this important subject.

A handwritten signature in black ink that reads "Robert J. Lieberman".

Robert J. Lieberman
Assistant Inspector General
for Auditing



DEPARTMENT OF THE AIR FORCE
AIR FORCE AUDIT AGENCY

03 FEB 1998

FROM: HQ AFAA/DOV
1125 Air Force Pentagon
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SUBJECT: Automating The Audit Work Paper Process

Our committee on Paperless Auditing is proud to present Automating The Audit Work Paper Process, a guide for selecting automated work paper products.

Committee members did not find comprehensive criteria to use when evaluating automated work paper products, and few commercial sources have marketed software packages for performance audits. Therefore, the team developed criteria based on auditing standards, computer nuances, and product support. They also identified three agencies using or planning to use automated work papers products, illustrated the process these agencies experienced during their selection procedures, and applied the team-identified criteria to four software products. In addition, the team identified contacts in 53 agencies to provide a support network for agencies wanting to automate their work paper systems.

The Paperless Auditing Committee, an inter-agency committee, is part of the Federal Audit Executive Council. The committee was created to identify ways technology can help provide more efficient and effective services for our audit clients. In February 1997, our first report illustrated how agencies are using computer assisted auditing techniques. This guide for selecting automated work paper software is our second product. We also reviewed several software products for analyzing data and computer security. We are currently evaluating methods and rules for assessing client databases and preparing a guide for computer security.

We welcome your suggestions for additional areas we should review to help enhance the auditing process in a paperless environment.

A handwritten signature in black ink that reads "J. D. Raube".

JAMES D. RAUBE
Committee Chair
Auditing in a Paperless Environment

Acknowledgements

We have many to thank for this guide. First and foremost, we thank Mr. Robert Lieberman, Assistant Inspector General for Auditing, Department of Defense, for establishing a forum to enhance the audit process. We are extremely grateful to the 53 participating organizations (Appendix C) that selflessly provided the perspective we needed for automated work paper use.

Our special thanks to Mr. Jackie Crawford, Auditor General, Air Force Audit Agency; Mr. Patrick E. McFarland, Inspector General, Office of Personnel Management; and Ms. Susan M. Gaffney, Inspector General, Department of Housing and Urban Development. Without their support and willingness to allow team members the time needed, this guide would not be. We are especially grateful to AFAA, HUD-IG, and OPM-IG for allowing us to illustrate what their teams learned during the selection process so others might benefit.

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Foreword

What should an organization look for if it wants to automate the work paper process?

This paper was prepared to assist organizations wanting to automate the audit work paper process. It provides criteria, perspective on others using automated systems, evaluation of four different automated products, and agency contacts enabling a support network for agencies to draw upon. Names and numbers of agency contacts are listed in Appendix D.

The criteria, defined by the team members, consists of work paper standards, general standards for automation, software requirements and product support, and cost.

The four product evaluations were based on specific organization needs, and basic criteria identified in Chapter 2. The AFAA Software was tested and is currently in use. AS/2 was not tested. Agencies are currently testing TeamMate and the IG Audit System.

The Automated Audit Program Software team presents this paper to you in the hope that it will help in your future evaluations of automated work paper programs. **It is not intended as an endorsement of any specific product, since there are major differences in requirements, areas of management emphasis, available resources, and other factors from agency to agency. In addition, new products are constantly entering the marketplace.**

To obtain additional copies of this report, see the IGNET homepage on the World Wide Web (<http://www.ignet.gov>).

INTRODUCTION

Background

A critical emerging issue within the audit community is how to improve audit products and processes at less cost using advanced technology. Agencies want a system that automates basic workflow processes including work paper preparation and control—a paperless automated process for preparing work papers.

A paperless automated process is an appealing goal that is increasingly within reach. Automated audit program software (AAPS) products are emerging that can help agencies. Before committing its resources to an automated process, agencies must consider how automation impacts data integrity, if courts will accept automated work papers, organization needs, auditing standards and guides, ease of use, product support, and cost.

To help agencies select an AAPS, the Federal Audit Executive Council Committee for Paperless Auditing established a subcommittee to evaluate Automated Audit Program Software. Subcommittee member bios are included in Appendix E. The subcommittee evaluated existing criteria, reviewed four systems, and established agency contacts enabling support networks for agencies who want to invest in AAPS.

OBJECTIVES, SCOPE, AND METHODOLOGY

Our subcommittee surveyed 66 audit organizations to determine what AAPS auditors are using, agency satisfaction with the products, and impact the product has on each agency. The subcommittee reviewed four products in depth: AFAA Software, AS/2, IG Audit Software (IGAS) (LOTUS Notes based), and TeamMate. The subcommittee established evaluation criteria in Chapter 2 based on auditing standards and Comptroller General Decisions. While the subcommittee did not identify all unique potential user's needs, it did include as examples the needs of three organizations and how those needs relate to selected products. Differing needs resulted in different choices.

This paper includes contact names and phone numbers of individuals using different automated work paper products to enable an informal support network for users to compare problems and solutions.

STANDARDS, GUIDES, AND CRITERIA

AUDIT STANDARDS AND GUIDES

Criteria for work paper standards were extracted from the Institute of Internal Auditors "Standards for the Professional Practice of Internal Auditing." The team used the Institute of Internal Auditors (IIA) Standards rather than generally accepted government auditing standards (GAGAS) because the IIA provided slightly more criteria. The work paper standards noted in this paper are equally true for GAGAS.

Currently, Standards for the Professional Practice of the Institute of Internal Auditing (IIA) permit auditors to use media other than paper when preparing work papers to support audits. Courts have allowed use of electronic evidence under certain conditions based on a Comptroller General decision. However, except for instructing auditors to consider generating backup copies (IIA 420.01.5e), and permitting electronic media as evidence, IIA Standards and the law for automated work papers are vague. This paper discusses IIA Standards, the Comptroller General Decision, and identifies the corresponding automation standards organizations should require for work paper preparation, supervisory review, obtaining audit evidence, electronic signature integrity and control, and work paper storage.

Audit Work Paper Preparation

IIA Standards require work papers to aid in planning, performance, and review; facilitate third party reviews; document whether audit objectives were achieved; and provide a basis for evaluating internal audit's quality assurance program. Additionally, IIA Standards state work papers provide support for insurance claims, fraud cases and lawsuits, aid in professional development of internal audit staff, and demonstrate compliance with IIA Standards. Audit work papers must permit any experienced auditor having no prior connection with the audit to follow the audit's flow and support the auditor's conclusions. While IIA Standards do not refer to automated work papers, one may infer auditors must structure automated work papers in the same manner as written hard copy work papers. It is of utmost importance that automated audit techniques used in audits are properly documented, understandable, and reliable so any experienced auditor may review audit work papers and follow results of an audit performed using such techniques. Additionally, special controls are necessary to protect the integrity of electronic work papers, which, by nature, will not bear the preparer's visible initials or signature. One such control is to prohibit changes to electronic work papers by anyone other than the auditor who created the work papers (CIA Exam May 1992). More precisely, any automated system should contain a control to prevent anyone other than the preparer from changing, editing, or otherwise altering a work paper.

Supervisory Review

IIA Standards specify that someone at a higher level of responsibility than the work paper preparer must review work papers. IIA Standards cite specific requirements and identify supporting evidence for such reviews. The reviewer should (1) initial and date each work paper reviewed; (2) complete an audit work paper review checklist; or (3) prepare a memorandum specifying the nature, extent, and results of the review (IIA 420.01.5j-l).

Any automated work paper system must provide not only the means for recording supervisory work paper reviews but evidence to support such reviews. More critically, any automated system must contain a control to prevent anyone from removing or destroying work paper review results.

Obtaining Audit Evidence

When auditors examine client records, work papers should describe those records so an experienced auditor having no previous connection with the audit can ascertain from them the evidence that supports the auditors significant conclusions and judgements. IIA Standards accept any means for auditors to identify specific evidence examined. Auditors are not required to include copies of documents examined in the audit work papers, nor are auditors required to list detailed information from those documents. However, in order to properly document evidence auditors must sometimes photocopy documents and include such photocopies with the audit work papers. Similar conditions may occur when auditors use automated systems. Modern technology allows auditors to "scan" client exhibits into electronic work papers. If auditors use such procedures, the automated system must meet certain legal requirements and contain a control to prevent anyone from changing, editing, or otherwise altering the scanned exhibit.

Electronic Signature Integrity and Control

IIA Standards specifically state audit reports should be SIGNED and written. The term "signed" means the authorized auditor should manually sign his/her name on the report or on the cover letter (IIA 430.01.3). If audit reports are distributed via electronic means, the audit agency should keep a signed version of the report on file. (IIA 430.01.4). Also, the preparer must sign any audit work paper, whether prepared for audit support or to evidence supervisory review. In addition, the automated signature generation and validation processes should comply with Federal Information Processing Standards (FIPS). Specifically, the automated signature must be (1) unique to the signer; (2) under the signer's sole control; and, (3) verifiable.

Work Paper Storage

While the IIA Standards do not address work paper storage, a 1991 Comptroller General decision, 71 Comp. Gen. 109 (1991), addressed whether government contracts

generated and stored electronically could satisfy a statutory requirement that the contract be "in writing." The decision concluded that electronic technology allowing data "to be examined in human readable form, as on a monitor, stored on electronic media, recalled from storage, and reviewed in human readable form," can provide data integrity that equals a paper document.

EVALUATION CRITERIA

The AAPS team evaluated automated work paper software using as criteria specific agency needs, work paper standards, general criteria, software requirements and product support, and cost. The team-identified criteria are detailed as follows.

Organization Needs Criteria

Specific needs vary depending on the organization's goals and objectives. Specific needs of three different agencies are illustrated in chapters 4-7 as a guide. Different needs resulted in different software choices.

Work Paper Standards Criteria

Audit Work Paper Preparation

- Follow audit flow (understandable)
- Support auditor conclusions
- Properly documented
- Reliable
- Controlled to prevent unauthorized changes

Supervisory Review

- Reviewer initial and date each work paper reviewed
- Complete an audit work paper review checklist, or
- Prepare a memorandum specifying the nature, extent, and results of the review

Audit Evidence

- Describe client records so an experienced auditor can understand the basis for conclusions
- Allows for scanning documented evidence
- Scanning certified, reliable, and secure

Electronic Signature Integrity and Control

- Ability to maintain a signed hardcopy version of the report on file
- Electronic signature unique to the signer
- Electronic signature under the signer's sole control
- Electronic signature that is verifiable

Work Paper Storage

- Can be examined in human readable form
- Can be recalled from storage
- Can provide data integrity that equals a paper document

Security

- Access Password protected
- Controls prohibiting user altering scanned evidence document
- Controls on altering work papers
- Controlled access to the audit system
- System defined access levels
- Controls on deleting work papers
- Encrypted work paper/document transmission
- Can encrypt signature

General Criteria

- Cross reference between applications
- Cross reference to spreadsheets
- Cross references to spreadsheet cells
- Cross references move with the file
- Automatically generate audit report
- Provides trail of all entries/revisions made to the work paper
- Provides for/accepts simultaneous edits
- Blocks unfinished work papers from review
- Extracts audit step responses for summarization
- Database import/summarization feature

Software Requirements and Product Support Criteria

Software Requirements/Options

- Auditor workstation
- Network capability
- Import capability
- Interface with other software

Hardware Requirements/Options

- Auditor workstation
- Server

Product Support

- Technical support
- On-line support
- Training
- Company modify product for client
- Upgrades

Cost

Costs for each of the four systems are provided for reader use and comparison. Each potential user must further analyze the cost and perform cost benefit analysis to decide if a particular system is cost effective. Since cost benefit is inextricably tied to individual user needs, this paper did not attempt to provide an overall cost evaluation.

Chapter 3

SURVEY RESULTS

We surveyed 66 audit agencies within the national capitol region and Panama Canal to determine how many are currently using automated audit program software (AAPS). Fifty-three of 66 (80 percent) responded to the survey. Of the 53 respondents, 20 (38 percent) are using or plan to use software to automate the work paper process. Eight currently use software to automate work paper preparation and control, 12 plan to automate the work paper process, and 35 neither use nor anticipate using automated software. Air Force Audit and Department of Education are counted twice since both are evaluating commercial packages to enhance their in-house software.

Seven of the 12 planning to use AAPS are looking at commercial off-the-shelf packages while 2 are evaluating in-house developed packages. Three of 7 are currently testing commercial AAPS products, and 1 of 12 is testing an in-house developed product. The remaining 3 are evaluating successes and failures others experience, and evaluating their own needs.

Audit Organization	Plan to use	Using	AWP Product
Air Force Audit Agency	X	X	AFAA Software (using) TeamMate (testing) procurement pending.
Amtrak	X		Lotus Domino
Corporation for Public Broadcasting	X		Unknown
Defense Intelligence Agency	X		Unknown
Department of Education	X	X	DOE System (using) Lotus AAS (Preliminary Phases of transitioning)
Department of Housing and Urban Development	X		HUD IG Audit System, Lotus Notes based, developed in-house. Testing.
Department of the Treasury	X		Unknown
Farm Credit Administration	X		Beginning FY 98 will use Audit Information Management software provided by the OIG Federal Reserve Board.
Federal Deposit Insurance Corporation	X		Pilot Testing Lotus Notes Automated Audit System.
National Aeronautical and Space Agency	X		TeamMate.
Office of Personnel Management	X		TeamMate. Currently testing a pilot audit. Audit process is becoming more effective and efficient. Auditors can easily see the current status of all audit work; working papers are maintained in one location and available for the audit team to access and review key information. Less paper and faster documentation process.
U S Postal Service	X		TeamMate.

Of the 8 using AAPS, 6 were satisfied with the software, 1 expressed relative satisfaction but desired improved software performance, and 1 found more improvements are needed to meet audit needs.

Following are the positive and negative impacts organizations identified as a result of using AAPS:

<u>Organization</u>	<u>Software</u>	<u>Comment</u>
Commerce	ATB	Cuts time and work. Plan to automate more.
DCAA	TEWPs (Microsoft Based)	Tailored Electronic Working Papers, an internally-developed application based on Microsoft Word programming. Provides a structured, automated process for audit planning and risk assessment. Directs the risk assessment to audit objectives, the audit program, and completion of audit steps. Supports DoD's goal of moving toward a paper-free contracting process by 2000.
Education	DOE (Word Perfect based)	Well received in our Chicago Office. We are currently expanding use through pilot audits in other field offices. It facilitates summarization, supervisory review in remote locations, and cross-indexing.
Labor	DoL Audit System	Internally developed product used for annual audit of the department's consolidated financial statements. Designed for a "paperless" environment but still printing as of this time.
EPA	Lotus AAS	Relatively satisfied with the overall product; however, not satisfied with its current indexing and scanning capabilities. Specifically, automated indexing not efficient, since not "point-to-point." The current scanning technology is not fast or efficient enough for large documents, has an unacceptable error rate, and hampers system performance. Consequently, EPA now limits scanning to documents of 3 pages or less. Also, since the current policy at the Federal Record Center is to accept records only in paper format, EPA must print all "paperless" audits for archival purposes.
FBI	Audit Program Generator	Purchased from AICPA, version 2.0. Not satisfied with the product. The software does not provide assistance in developing audit programs for performance or Information System audits. However, the software has assisted the FBI in developing financial and equipment audits. Also, FBI hopes to integrate its internally-developed "automated work papers" program with this product after some security and infrastructure issues are resolved.
GAO	GAO (PC-DOCS based)	Satisfied.
AFAA	AFAA Software	First step in direction of paperless auditing. Provides readily accessible templates, forms, guidance and internal control information. Helps improve computer skills.

AFAA SOFTWARE

DESCRIPTION

The Air Force Audit Agency (AFAA) created and supports AFAA Software (hereinafter referred to as "the Software") for its 850 audit and administrative personnel located throughout the world. While AFAA will provide the Software free to interested agencies, it does not provide outside support. AFAA will provide updates upon request.

The Software consists of templates, forms, and instructions to aid in the audit process. It has 8 toolbar "buttons" which trigger templates and forms, AFAA instructions, government auditing standards (GAO Yellow Book), internal control guidance, computer data risk analysis, and on-line help.

1. **Templates and Forms**. Three template and form toolbar buttons contain 74 templates and forms AFAA personnel use when performing day-to-day auditing or administrative activities. Additionally, users can add office-unique templates or forms to their copy of the Software.
2. **AAIs and GAO Yellow Book**. The Software has 2 toolbar buttons which contain AFAA instructions and the GAO "Yellow Book." Auditors can double click on a chapter heading in an instruction's table of contents and the Software will go directly to that chapter. Additionally, auditors can "copy" relevant text into other work paper files.
3. **Internal Control Guidance and Computer Data Risk Analysis**. The internal control toolbar button accesses an array of internal control questions and helpful hints for auditors to consider when writing audit programs or evaluating client internal control structures. Also, auditors can "copy" the questions directly into their audit programs. The computer data risk analysis toolbar button opens a feature that, through a step-by-step process, helps auditors determine the reliability risk of computer-generated data. In addition, the feature provides a record of how much (high, medium, or low) substantive data testing auditors should perform, which auditors can save as a support work paper.
4. **"On-Line" Help**. The Software's "on-line" help file contains general instructions about using the Software and specific instructions for using each toolbar button and associated features, templates, and forms.

AIR FORCE AUDIT AGENCY (AFAA)

Background

The Air Force Audit Agency (AFAA) is comprised of over 850 audit and administrative personnel. AFAA auditors perform two distinct types of audits: (1) local audits, whereby one auditor develops and applies an audit program at a single location (i.e., an Air Force base) and briefs audit results to the base commander and affected organizations, and (2) centrally-directed audits (CDAs), whereby an audit manager at a central location develops and sends an audit program to as many as 15-20 locations. In turn, an auditor at each location applies the audit program and submits results to the audit manager. The audit manager summarizes all responses into a comprehensive audit report and briefs results to the Air Force Secretariat staff.

In April, 1994, AFAA chartered a Process Action Team (PAT) to (1) evaluate the benefits of audit work paper automation techniques, (2) develop audit work paper automation techniques, (3) computerize AFAA templates and forms, and (4) develop guidance for using automated techniques, templates, and forms. The Agency's goals were to facilitate an emerging paperless audit environment, incorporate quality innovations, and comply with generally accepted government auditing standards.

The PAT developed a prototype system containing templates and forms, Agency instructions, internal control guidance, computer data risk analysis, an automated audit program writer, a cross referencing feature, and a database import/summarization feature. The PAT's objective was to create a "paperless" audit environment allowing auditors to formulate the audit program with the program writer, respond to audit steps "inside" the electronic program file, and create electronic cross references from audit program responses to supporting electronic work papers. Additionally, audit managers could summarize electronic CDA responses after importing the responses into a database. However, prototype test results found the program writer, cross referencing, and database import/summarization features required extensive additional programming beyond the expertise of AFAA personnel.

AFAA initiated a two-fold approach. First, AFAA distributed useful portions of the prototype which include the forms, templates, audit guides, and instructions. Second, AFAA formed two focus groups to identify functional requirements for a comprehensive automated audit system and evaluate costs and benefits of developing or purchasing a package that could fulfill requirements. See TeamMate, Chapter 7, for more information on AFAA's second approach.

AFAA Needs

AFAA needs an audit automation capability that can facilitate both its local and centrally directed audit processes. Such a product should help auditors provide principal support for audit reports, aid auditors in conducting and supervising audits, and allow reviewers to assess audit quality. The product should include a feature allowing audit

managers to summarize and analyze information from many different audit locations. The product should be relatively easy to learn and use and generate internally-developed electronic work papers, accept and compare data from many sources, and reference to and from different applications (i.e., Word and Excel files and electronic exhibits). The product should also operate with Microsoft Office application software and must meet generally accepted government auditing standards.

EVALUATION

AFAA Need Criteria

The Software allowed AFAA to take the first step toward saving time through use of audit automation. The forms, templates, guides, and instructions with look-up capability all provide auditors with needed information at their fingertips. It did not, however, allow auditors to formulate the audit program with a program writer, respond to audit steps "inside" the electronic program file, and create electronic cross references from audit program responses to supporting electronic work papers. The Software does not provide a feature for audit managers to summarize and analyze electronic CDA responses.

Audit Work Paper Standards Criteria

Audit Work Paper Preparation. Although the Software does not materially contribute toward a user's ability to follow the audit's flow (understandable), templates provide formats auditors can follow providing reasonable assurance that: (1) another user can follow the audit's flow, (2) work papers support the auditor's conclusions, (3) the audit is properly documented, and (4) work papers are controlled to prevent unauthorized changes.

Supervisory Review. The Software allows reviewers to initial and date each work paper reviewed, formulate and complete a review checklist, or prepare a memorandum specifying the nature, extent, and results of the review. The work paper reviewer is responsible for providing the aforementioned assurances.

Audit Evidence. The Software does not prevent an auditor from describing client records in any fashion necessary so that an experienced auditor can understand and examine the same records. However, the auditor must provide a method for the user to follow the work papers as the Software does not contain an automated mechanism to "track" to or from audit work papers. The Software does not incorporate a mechanism to scan documents or other exhibits into electronic files.

Electronic Signature Integrity and Control. The Software does not incorporate electronic signature features or controls.

Work Paper Storage. Any work paper prepared using the Software can be examined in human readable form, archived onto a floppy diskette, compressed "zip" diskette, or a cassette tape, and recalled from storage, if properly stored. However, the Software does not control access to the work papers nor does it provide a method to identify changes to an electronic work paper. The Software does not provide data integrity equaling a paper document.

Security. The Software does not control access (for example, via password) to the work papers or define access levels (otherwise known as "permission levels"). The Software does not prohibit a user from altering or deleting scanned evidence or other audit work paper files. The Software does not encrypt transmitted files.

General Criteria

The Software contains no automated cross referencing feature. The Software provides an AFAA-specific template for preparing the audit report; users complete the template by typing, or cutting and pasting data from other electronic files. The Software provides no automated trail of all entries and revisions made to the work paper and does not provide for or accept simultaneous edits. However, users can edit work papers via the Microsoft Word annotations/revisions feature. The Software does not electronically extract responses to audit programs. Unfinished work papers cannot be blocked from review; however, users can select which electronic files to send to a reviewer. The Software does not have an import/summarization feature. The Software does not have an automated audit backup feature but does interface with the Microsoft Word/Excel "Save/Save As" feature. The Software contains predefined templates and forms and allows users to develop other templates and forms.

Software Requirements and Product Support Criteria

Software Requirements and Options. Requirements for the auditor workstation are Windows 3.11 or Windows 95. The Software will interface with any E-mail package that supports file attachments. Users can install the Software onto a common (local) server, and import templates or forms directly to their PC. The user can also import other Microsoft Word or Excel files into the predefined templates provided by AFAA software. The Software interfaces with Microsoft Word, Excel, PowerPoint and Access (Microsoft Office or Office 95).

Hardware Requirements/Options. Minimum hardware requirements are a 486.33 Processor.

Product Support. AFAA provides technical support and training for its auditors and administrative staff. AFAA does not provide technical support and training to other agencies. However, the Software's on-line help toolbar button accesses instructions for using toolbar buttons and associated features. AFAA will provide software installation instructions upon request. While AFAA will not modify the product for requesting

organizations, it will provide programming code so other agencies can modify the product. Users should have a working knowledge of Visual Basic programming techniques to understand and use the Software programming code.

COST

AFAA will provide the Software and programming code at no charge upon request. The requesting organization must agree not to use the Software for commercial purposes.

CONCLUSION

The AFAA Software is a first step in the direction of audit automation. It complements the audit process by offering a method for users to access computerized templates and forms used in every day audit and administrative activities, to reference guidance and internal control information, and to improve computer skills. It does not fully automate the work paper process.

Chapter 5

AS/2

DESCRIPTION

Deloitte and Touche created and supports AS/2 for both its clients and its 22,000 worldwide audit staff. Deloitte and Touche designed AS/2 putting the team leader in control of both the audit and the security. The team leader maintains the audit master copy and controls access. As designed, the team leader assigns each team auditor tasks and provides a copy of the audit master portion related to the assigned tasks. Auditors return completed work papers to the team leader who then updates the master audit file.

AS/2 automates all phases of an audit from planning to fieldwork to reporting, and simplifies workflow by managing audit files electronically. AS/2 allows teams to collect, share, review, and analyze audit information quickly. It allows for scanned documents and audio information. "Smart Audit Support" tracks and manages audit issues and report findings. In addition, the "Smart Audit Support" feature can create custom documents such as internal control checklists and risk analysis. AS/2 integrates existing audit programs and can incorporate existing templates, reference materials, and audit tools. AS/2 integrates with file interrogation software, such as ACL or IDEA, for quick analysis of large volumes of data. STAR (Statistical Techniques for Analytical Review) is already included in AS/2.

OFFICE OF PERSONNEL MANAGEMENT OFFICE OF INSPECTOR GENERAL (OPM-OIG)

Background

The Office of Personnel Management Office of Inspector General (OPM-OIG) is comprised of over 90 auditors, investigators, and administrative staff centrally located in Washington, DC. OPM auditors perform two distinct types of audits: Health and Life Insurance Carrier Audits and OPM Internal Activities Audits.

Health and Life Insurance Carrier Audits. OPM-OIG contracts with private sector firms to underwrite and provide health and life insurance benefits to federal employees, annuitants, and their dependents and survivors through the Federal Employees Health Benefits Program and the Federal Employees' Group Life Insurance Program. OPM-OIG is responsible for auditing their operations. OPM-OIG audit universe contains approximately 565 audit sites, consisting of health insurance carriers, sponsors, underwriting organizations, and two life insurance carriers.

OPM Internal Activities Audits. OPM-OIG is also responsible for conducting a wide range of audit activity covering OPM programs and administrative operations. This activity includes such diverse areas as financial statement audits required by the Chief Financial Officers Act; President's Council on Integrity and Efficiency for government-

wide audits; audits of agency compliance with laws and regulations, such as Prompt Payment Act and Federal Managers' Financial Integrity Act; and performance audits of OPM programs that involve the range of the agency's responsibilities for retirement, employee development, and personnel management activities.

Audit Automation Quality Team. OPM-OIG established the Audit Automation Quality Team (the team) in May 1995 to evaluate potential alternatives for increasing efficiency and effectiveness through automation. In addition to reviewing paperless automated work paper systems, OPM-OIG also considered whether converting its audit guidance and regulations into an electronic format would improve the work process. Since OPM-OIG did not have personnel resources to develop an in-house system, the team evaluated several commercial audit automation products including Lotus Notes, TeamMate, and various other document management systems.

After 4 months the team recommended OPM-OIG wait to purchase a paperless automated auditing system because costs were too high and existing product support was inadequate to meet user needs. The team found putting audit guidance and regulations in an electronic format could help improve the process—but only if OPM-OIG could upgrade its existing hardware to meet increased needs such as memory and data manipulation. As a result of the team's evaluation, OPM-OIG upgraded hardware, purchased a scanner to help transit toward a paperless process, and began converting paper audit guidance and regulations into an electronic format.

In October 1996 the team re-evaluated automated products. The team found companies were improving their systems and product support. OPM-OIG decided to evaluate two systems: TeamMate¹ and AS/2 based on specific OPM-OIG needs, and audit work paper standards.

OPM-OIG Needs

OPM-OIG's goal is to increase the efficiency and effectiveness of audits by implementing a paperless audit process. OPM-OIG basically wants a system to assist in the production of audit programs, maintain and store work papers, electronically link (cross-reference) work papers, track findings, and generate a draft report. OPM-OIG wants a system that allows work papers to be accessed, shared, and reviewed electronically from different locations. OPM-OIG also wants a system with a database that will track the status of audit program steps and working papers, and security features to protect the integrity of work papers.

¹ See evaluation of TeamMate, Chapter 7.

EVALUATION

OPM-OIG Need Criteria

AS/2 met OPM-OIG specific needs to assist in the production of audit programs, maintain and store work papers, electronically link work papers, track findings, and generate a draft report. It also allowed auditors to access and review work papers from different locations. While the team leader controlled access to the work papers, there were no controls to prevent changes after the work papers were reviewed.

Audit Work Paper Standards Criteria

Audit Work Paper Preparation. AS/2 allows for a flexible audit workflow process. It is up to team leaders to organize the flow of the working papers according to their office standards. AS/2 can handle most index schemes.

AS/2 maintains all audit evidence, from auditor prepared working papers, scanned documents, or even audio evidence. AS/2 can link related working papers to support an auditor conclusion. AS/2 allows for customized working papers. Each agency may customize and import audit templates, checklists, etc.

Working paper reliability is based, primarily, on the auditor's ability to properly document audit results. AS/2 does not have security features preventing unauthorized changes to a working paper, including scanned documents.

Supervisory Review. There are no controls preventing non-supervisors from signing working papers. Anyone gaining access can delete working papers. AS/2 allows four preparer signatures and four reviewer signatures. A template exists within AS/2 allowing reviewers and auditors to track work paper review notes.

Audit Evidence. AS/2 can incorporate audit evidence several ways. Auditors may prepare work papers using Microsoft Word or Microsoft Excel, import client files, scan documents, or even use audio applications.

Electronic Signature Integrity and Control. AS/2 is document based. Auditors can print all electronically prepared working papers. The electronic signature of auditors and reviewers are unique to the signer; however, electronic signatures are not under the signer's sole control. The electronic signature is not verifiable or encrypted.

Work Paper Storage. Auditors can store completed audits on-line, on discs, or on a CD-ROM so users can access information. If needed, auditors can re-load completed audits on a system for wider access. There are no controls preventing others from modifying work papers after audits are completed.

Security. Access to audits in AS/2 is password protected for each user. Team leaders control access to audits and specific documents. AS/2 does not define user access levels (i.e. work paper preparer, reviewer, or supervisor). It is up to the team leader to define and track team member's responsibilities. AS/2 does not prevent someone from deleting or altering work papers. AS/2 does not provide an edit history of each working paper. There is a mild form of encryption auditors can use when transmitting audit work.

General Criteria

AS/2 can link (cross-reference) between working papers of the same or different applications. AS/2 can even link between spreadsheet cells. Cross-reference notations will move with the work paper even if the index number changes.

The overall status of an audit is tracked based on the status of the work paper documents created in AS/2 and not on the status of the audit program. The auditor can view status of audit steps in an audit program created in Microsoft Word with electronic links to supporting work papers.

Findings are developed in working papers and put in an AS/2 template, which tracks all findings. Auditors can generate draft reports from the finding tracker.

AS/2 controls access to work papers by maintaining one master copy of the file, thereby preventing simultaneous edits. Carbon copies of the work papers are available. Work papers are adequately identified as master or carbon copy. It is up to the team leaders to resolve conflicts between master and carbon copies.

Software Requirements and Product Support Criteria

Software Requirement/Options. AS/2 requires Windows 95, Microsoft Excel 5.0c, and Microsoft Word 6.0c. D&T recommends ACL and Folio VIEWS 2.1a to facilitate audit analysis. D&T will include Folio VIEWS 3.1a in its next release.

Hardware Requirements/Options. D&T recommends a Pentium-based personal computer with 16 megabytes of RAM, 800 megabytes of hard disk storage, and a CD-ROM (CD-ROM not required).

Product Support. D&T will provide three days of on-site training and implementation assistance. A tutorial guide and on-line help are included. An annual maintenance fee of 20 percent of the purchase price includes toll-free telephone support and upgrades. D&T will customize AS/2 to meet agency needs.

COST

1-20 users	\$20,000
21-50 users	\$20,500 - \$35,000
51-100 users	\$32,300 - \$42,800

Annual maintenance fee is 20 percent of the purchase price. Maintenance fee includes on-going technical support and upgrades.

CONCLUSION

The Audit Automation Quality Team found AS/2 adequately manages an audit electronically and is easy to use. AS/2 has a flexible work paper index scheme and an extremely good method for cross-referencing related work papers. However, the team wanted its system to define access levels (e.g. work paper reviewers and work paper editors), prevent an auditor from deleting work papers after supervisor review, and provide an unlimited edit history for each work paper. The team also wanted its system to electronically track the status of audits based on the audit program instead of work paper documents. Since AS/2 did not provide all the team wanted, OPM-OIG chose not to pilot test AS/2. OPM-OIG is currently pilot testing TeamMate 97.

INSPECTOR GENERAL AUDIT SYSTEM (IGAS)

DESCRIPTION

The Department of Housing and Urban Development, Inspector General (HUD-IG) is developing the IG Audit System (IGAS). HUD-IG is willing to share its software and support other agencies on a cost-share basis.

HUD-IG's goal is to provide a faster and more effective way to prepare work paper documentation so audit staff can spend less time on the mechanics and more time on customer service. IGAS provides for electronic work paper preparation, approval, retrieval, and referencing. Other anticipated benefits are increased audit productivity and quality, improved work paper management, and reduced paper retention.

IGAS is designed in Lotus Notes which operates in a network environment. HUD-IG took advantage of Lotus Notes rapid application development features to develop its work paper system. Since Notes provides for document creation, control, and storage in a database environment, HUD-IG found Lotus Notes a perfect match for its own work paper documents. The basic package contains ready-to-run application templates for most common groupware applications including team issues, customer service, meeting tracking, status reporting, reservation scheduling, and more. Using Lotus Notes as the base, IGAS has the capability to store and share information throughout the organization using Notes' groupware and database technology.

Lotus Notes

How does Lotus Notes actually work? Lotus Notes is a client-server environment in which users (clients) communicate over a local area network (LAN) with databases residing on one or more shared Notes servers. With Notes, all users have simultaneous access to the same critical information. Through use of database replication, every copy of the database is always up to date. Even remote users only occasionally connected to the network can participate fully in Notes information sharing. Lotus Notes also has an integrated E-mail system, which provides for document exchange without having to exit the system. Documents are shared either directly through the common Notes databases, or seamlessly over the internal E-mail system.

Groupware

Groupware is designed to help teams of people work together in smarter, faster, more productive ways. Groupware allows organizations to integrate knowledge, work processes and computer applications to improve performance. Groupware optimizes the potential of an office by giving every team member the ability to view and update documents, share ideas, and access applications. As a result, consensus is reached more easily, workflows more smoothly, and decisions are made more quickly.

Groupware has the potential to breakdown organizational barriers and is especially adaptable for team audits. If information does not freely travel from one group or organization to another, intergroup misunderstandings and friction can develop. Groupware tends to encourage behavior benefiting organization and audit goals. Additionally, when contributions are documented, people are recognized.

**DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
OFFICE OF INSPECTOR GENERAL (HUD-IG)**

Background

HUD-IG is comprised of three separate organizations with different authorities and responsibilities: (1) the Office of Audit; (2) the Office of Investigation; and (3) the Office of Management and Policy. Approximately 300 of the 519 audit and administrative staff are assigned to the Office of Audit. HUD-IG performs financial and performance audits externally and internally. The external audits include recipients of grants and subsidies. Internal audits are on Department operations. Most audits are directed and staffed from either the Headquarters or one of the ten District Offices across the country based upon geographical boundaries.

In 1995 HUD-IG Information Systems (IS) Audit Division decided to explore the potential for automating the audit work paper process. IS's objective was to improve the efficiency and effectiveness of the audit process, and to reduce paper. HUD auditors were using a variety of software including word processors and spreadsheets; but in the end, auditors would convert electronic documents to paper. HUD-IG constructed, maintained, and stored increasingly voluminous amounts of paper-based work papers. HUD-IG wanted a properly constructed automated system to reduce paper administration and use, provide more effective controls over the work paper process, and increase audit productivity and quality.

The IS Audit Division began researching state-of-the-art automated audit systems. It initially looked for a suitable commercial off-the-shelf package to cut development costs and decrease long development and testing time inherent in development projects. The IS division looked both at Federal government and private sector audit organizations for available packages. While several internal audit organizations in commercial corporations were using some automated work paper systems, only a few were marketed externally. The IS Division found one product the Nations Bank and the Lotus Consulting Service Group jointly developed that appeared to meet HUD-IG needs--the Automated Audit System (AAS).

After an initial test evaluation, the IS Division found AAS did not meet HUD-IG needs. First, the software was offered "as is," meaning neither Lotus nor Nations Bank would provide any product maintenance. Buyers had to provide their own in-house

support and development resources. Second, the application was written in an earlier version of Lotus Notes and did not take advantage of current version advantages, such as incorporation of the Script Language. Third, and probably the most crucial for HUD-IG, AAS requires a new database for each newly initiated audit.

Creating a new database requires fairly sophisticated knowledge of the Lotus Notes system. HUD-IG wants its auditors to concentrate on the client—not the software system. In addition, HUD Notes Administrator requires thorough testing of every new database before approving it for the operational environment. HUD-IG would have to wait for the Notes Administrator to approve each audit database before it could begin an audit.

In March 1997, the IS Audit Division recommended HUD-IG develop its own in-house system because it could not locate a commercial off-the-shelf product to meet HUD-IG needs. The IS Audit Division also recommended HUD-IG use Lotus Notes as its platform to remain compatible with the HUD system. HUD was switching the E-mail system from CC-Mail to Lotus Notes Mail. This switch would further integrate the audit system. Since HUD agreed to absorb costs for administering the Lotus Notes platform and network, HUD-IG could concentrate resources on the audit application. As Barry Kahn, HUD-IG, said, "By developing our own system, we would be able to use the features of the latest version of Notes."

HUD-IG Needs

HUD-IG needs an easy to learn automated work paper process so auditors can spend more time with clients, and so HUD-IG can reduce paper use and administration. HUD needs a system that will encompass the entire work paper process including creation, approval, and storage. The system needs to accommodate both internally and externally generated work papers. The system should have equal functionality in the office or at the audit site. The system should also have superior security capability to protect against unauthorized access. The system must operate in the Lotus Notes environment and must meet generally accepted government auditing standards.

EVALUATION

HUD-IG Need Criteria

The IGAS prototype system meets all HUD-IG needs to automate the system, reduce paperwork, and encompass the entire work paper process including creation, approval, and storage. It will accommodate internally and externally generated work papers, and it has equal functionality in the office or at the audit site. HUD-IG IS Division began testing its prototype in November 1997.

Audit Work Paper Standards Criteria

Audit Work Paper Preparation. The system is designed to be generic in nature. It will adapt to any audit workflow process. The system is intended to automate the "mechanics" of the work paper process. How work papers are organized and relate to the audit program so others can understand is entirely up to the audit manager/AIC. Preparation of working papers follows the standard manual processes and conforms to all the current work paper standards.

IGAS makes full use of the Document Linking feature of Lotus Notes to help support auditor conclusions. This feature allows auditors to electronically connect or link one document to another. Placing a small icon next to the desired document or location in the document readily identifies and directly accesses support for auditor conclusions.

All work papers have identifying information contained in standard headers and footers for proper documentation. The auditor can input identifying information such as the particular audit, the information source, and all other required information.

All audit work papers have full security of the Lotus Notes system to ensure work paper reliability. Notes has seven layers of security access over each database. In addition, the IGAS has additional access security to ensure all papers are properly controlled. Only individuals who are granted access can modify documents. This is the strongest feature of Lotus Notes and of the IGAS system. This feature helps provide assurance so others can rely on audit work papers.

Supervisory Review. IGAS' controlled review system requires electronic sign on and sign off for three designated levels. Only designated individuals can access and review the audit work papers.

Reviewers can choose from several different methods to input review notes including a pre-designed Reviewer's Point Sheet for accumulating review notes. Reviewers can annotate directly on the work paper in contrasting color and font, place a note directly on the work paper in a controlled access dialog box, create a separate review comment document for each work paper reviewed, use the integrated E-mail system to comment in a mail message, or use the separate Reviewer's Point Sheet.

Audit Evidence. Auditors can incorporate client records directly into the IGAS several different ways. The IGAS can import client records directly into a work paper document using several different file formats, it can embed client records, or it can attach client records. In addition, IGAS incorporates a sophisticated scanning system which allows for scanning external documents directly into an audit work paper.

Electronic Signature Integrity and Control. If a printed audit report with a manual signature is needed, the agency can scan the signed report into the system. The system also supports electronic signatures for the work paper preparer and for three

review levels. After verifying the signer as authentic, the system will automatically place the name and date on related work papers. As long as users maintain control over their passwords, they have control over their electronic signatures. The system verifies each signer based on sign-on procedures and user passwords. The system has encryption capabilities if required. However, the normal electronic signature process is not encrypted.

Work Paper Storage. IGAS has a two stage archival process. In the first stage after the audit is closed, work papers are moved from the current audit database to an online archival database. Once work papers are on the archival database, no one can modify them; thus, maintaining data integrity. The archival database is available online to all users of the IGAS. It is used as a resource for future audits and for quality reviews. Agencies can retain audits in the archive database as long as they desire. In the second stage, the audit is moved to permanent off-line storage on tape. If needed, auditors can request administrators to reload audits on the archival database.

Security. Access to the IGAS database is password protected. In addition, the database resides on the Notes server, which has an elaborate security mechanism in place for controlling different access levels. When a new audit is created, audit staff are assigned and roles are established. Associated with each audit role are certain access rights. The system verifies each audit staff member's identify when he/she signs on to the server. The system then matches the name with the assigned audit role and permits the individual to perform only predefined functions.

As the system is now designed, only the work paper creator can edit or delete work papers. The work paper creator can grant other audit staff edit rights to his/her documents. However, the system is flexible enough to accommodate any desired policy. Programmers can change the system to either prohibit anyone from deleting documents, or permit only selected individuals to delete documents. IGAS records a history of the last ten edits and saves. The history lists the name of the person saving the document, the time, and the date.

The IGAS system through Lotus Notes has a robust and multilevel encryption capability. Agencies can require encryption of the entire audit or individual work papers. In addition, the integrated E-mail system has its own message encryption capability so auditors can forward work papers over the E-mail system.

General Criteria

All work accomplished in other applications is either imported into a work paper, attached, or embedded within an IGAS document. Consequently, there is no need to reference another application. Auditors can either use an integrated spreadsheet application, or an external spreadsheet application. Auditors can establish cross-references between IGAS documents using DocLink. This is a Hyper-Text method (electronic link) between documents. A small link icon is placed on the document to

indicate the link is established. Double clicking the mouse pointer on the icon automatically brings up the linked document.

Cross-references or DocLinks are made between any two documents in a database or to a document in another database. DocLinks move or are accessible regardless of where the document is moved as long as the database icon appears on the users Notes desktop. At the present time, Lotus Notes cannot link to an individual cell within a spreadsheet or document. HUD-IG is exploring ways to program a solution. In the mean time, an annotation placed next to the DocLink icon will direct the user to a specific place in a document.

The IGAS system permits simultaneous document editing and has a feature for reconciling any editing conflicts. Auditors can identify which work papers are ready for review by clicking a "radio" button in the footer of each work paper. Once the button is activated, the document displays a notation in a column next to the work paper name in the index view. The system displays all work papers by assigned section and name. All marked work papers also appear in a separate view available only to managers and reviewers.

IGAS has the capability to create predefined templates and forms. Several standard audit checklists and commonly used administration work papers are already incorporated in the start-up process. The Notes Administrator routinely backs up the IGAS database. The IGAS does not currently automatically generate an audit report. However if users desire such a feature HUD-IG IS can include it in future updates. IGAS database. The IGAS does not currently automatically generate an audit report. However, if users desire such a feature HUD-IG IS can include it in future updates.

Software Requirements and Product Support Criteria

Software. IGAS in Lotus Notes runs on all popular client operating systems including IBM OS/2Warp, Microsoft Windows 3.1, Windows 95, Windows NT, Apple Macintosh, Novell NetWare, and UNIX platforms including IBM AIX, Sun Solaris, and HP-UX. Agencies can immediately deploy Notes applications developed on any platform across all Notes platforms.

IGAS supports the following server software: Microsoft Windows 95, Windows NT, OS/2, Novell NetWare and UNIX versions including IBM AIX, Sun Solaris, and HP-UX. IGAS supports the following network protocols: AppleTalk, NetBIOS/NetBEUI, SPX, TCP/IP, VINES, X.PC, X.25, and SNA.

Notes supports import and export of the following files.

Spreadsheet files

File type	Import into rich text field or view	Export from document or view	File extension	File description
Lotus 1-2-3	Rich text field or view	View	.WKS, .WK1, .WK3, .WK4	Entire worksheet created in Lotus 1-2-3 for DOS 1A or later, 1-2-3 for Windows/Macintosh
Microsoft® Excel	Rich text field	Not supported	.XLS	Microsoft Excel 4.0, 5.0

Graphics files

File type	Import into field or view	Export from document or view	File extension	File description
PCX Image	Rich text field	Not supported	.PCX	Raster graphic
Lotus PIC	Rich text field	Not supported	.PIC	Picture in Lotus 1-2-3 or Symphony
CGM Image	Rich text field	Document	.CGM, .GMF	Picture in software supporting ANSI Metafile
TIFF 5.0 image	Rich text field	Document	.TIF	Bitmapped image scanned software supporting TIFF
Bitmap Image (not UNIX)	Rich text field	Not supported	.BMP	Bitmapped image
GIF image	Rich text field	Not supported	.GIF	Graphics Format Interchange image
JPEG image	Rich text field	Not supported	.JPG	Photographic Group image

Word processing files

File type	Import into field or view	Export from document or view	File extension	File description
Lotus Ami Pro	Rich text field	Document	.SAM	Ami Pro 1.x, 2.x, 3.x
Microsoft Rich Text Format (RTF)	Rich text field	Document	.RTF	Applications that support .RTF, such as Word
Microsoft Word	Rich text field	Document	.DOC	Word for Windows 6.0
WordPerfect®	Rich text field	Document	.DOC, .WPD, .WPT	WordPerfect 6.0, 6.1
Frame Technologies FrameMaker® (UNIX only)	Rich text field	Document	.MIF	FrameMaker 3.0, 4.0
Interleaf ASCII (UNIX only)	Rich text field			Interleaf Version 5 or later

Text files

File type	Import into field or view	Export from document or view	File extension	File description
ASCII text	Rich text field	Document	Any	Unformatted text
Binary with text	Rich text field	Not supported	Any	Imports text from non-text files
Tabular ASCII text	View	View	Any	ASCII text arranged in rows and columns; limit of 1536 characters per record, total
Structured ASCII text	View	View	Any (except .TAB, .TXT, .PRN, .RPT)	ASCII text arranged as fields and field values; limit of 256 bytes per simple text field

IGAS can attach any file to a work paper document. It can embed a document from any other Object Link & Embedding (OLE) capable software. This includes all Windows based software.

Hardware Requirements/Options. The IGAS system, as a minimum, can operate on a 486, 40 Mhz machine with 12 MB of memory, and a 200 MB HDD. Remote users would need a modem. More memory and a faster machine will improve performance.

Minimum server requirements include a 486, 66 Mhz machine with 32 MB of memory, and 1 GB HDD. Again, more memory (64) is better. The Windows NT operating system requires 64 MG of memory. The server should also have a fast modem attached. A "Hunter Group" type Modem, which can manage multiple queries into the Notes server, is advisable.

Product Support. IGAS is a self-developed system. HUD maintains in-house Lotus Notes programmers to maintain all systems and provide technical support. Since IGAS is based on the Lotus Notes software, any knowledgeable Notes programmer can maintain the system. Since IS is the developer and only current user of the IGAS, on-line support is not needed. However, HUD-IG will support other government users on a cost-share basis. Training is available to any government user upon request.

Should other government agencies desire to use IGAS, a shared maintenance agreement is the vehicle for managing changes to the software. HUD-IG would share all upgrades with government users.

COST

Since HUD-IG developed the IGAS at government expense, the system is available to other Federal government organizations cost free. However, it is anticipated all users will share costs to maintain the system.

CONCLUSION

The IGAS system is easy to use with an intuitive interface. It is designed to automate the process of creation and control of audit working papers. It is not tied to any particular type of office software, and is also independent of any special or unique hardware or telecommunication platform. Since IGAS is built in the Lotus Notes environment, it can take advantage of the rapid application development tools making it relatively cheap and easy to maintain.

TEAMMATE

DESCRIPTION

Price Waterhouse (PW) created and supports TeamMate for its own auditing staff and for over 30 internal and external audit organizations throughout the world. In 1989, PW's objectives were to move auditors from the realm of paper and pencil into the distributed computing age, save time, and allow auditors to talk with clients between computer applications. To date, PW has invested over 21 man years and \$18 million developing TeamMate.

TeamMate is a single, integrated audit environment with a consistent look and feel throughout. It encompasses and automates the entire audit process, including planning, administration, report writing, documentation (evidence), and supervision. TeamMate connects applications through hypertext links, offers a publish and subscribe feature, and gives users the ability to embed images and annotations in documents. TeamMate also provides cross referencing and basic search and retrieval capabilities to facilitate high level reviews.

Users can work individually or in teams, with TeamMate's check-in, check-out feature to accommodate auditors disconnected from local area networks. Additionally, TeamMate incorporates Watermark imaging software so users can scan third party documents directly into the audit file. Watermark imaging controls prohibit any user from altering or changing a scanned document. Scanned documents using Watermark are accepted in courts of law for evidence reliability and security.

AIR FORCE AUDIT AGENCY (AFAA)

Background

AFAA identified functional requirements for a comprehensive automated audit system. It analyzed costs and associated benefits for developing a new system in-house, obtaining outside contractor support to reconfigure its prototype, and purchasing a commercially-developed software package. As a result of its cost benefit analyses, AFAA decided to purchase a commercial product meeting its needs. The operating environment of the AFAA is discussed in chapter 4.

AFAA Needs

In addition to the basic criteria discussed throughout this report, AFAA concluded a commercial product must: (1) include a feature allowing audit managers to summarize and analyze information from many different audit locations; (2) include technical support; (3) provide continued product maintenance; (4) meet generally accepted government auditing

standards (GAGAS); and, (5) operate and interface with Microsoft Office application software. In June 1997 AFAA formed a test group and began testing TeamMate.

EVALUATION

AFAA Need Criteria

The test team found TeamMate met requirements to include technical support, maintain the product, meet generally accepted government auditing standards, and operate with Microsoft Office application software. TeamMate does not currently have a feature allowing audit managers to summarize and analyze information from several different locations. Price Waterhouse is currently working with AFAA to develop this feature.

Audit Work Paper Standards Criteria

Audit Work Paper Preparation. TeamMate provides features enabling auditors to ensure work papers support audit conclusions, the audit is properly documented, and users can follow the audit flow (understandable). Specifically, the auditor develops the audit program and documents results directly in an electronic file called "audit procedures." Each procedure contains sections for the auditor to document purpose, scope, details, record of work completed, and conclusion. If the auditor needs to create an additional support work paper, TeamMate automatically creates an electronic reference which connects the electronic file to the support work paper. TeamMate also provides a real-time audit trail showing the status and all actions taken on each work paper. Specifically, a comprehensive summary viewer lists each work paper, date prepared, by whom prepared, date reviewed, by whom reviewed, and date edited after review, and by whom edited. The viewer also identifies all work papers ready for review.

Supervisory Review. To review work papers, a reviewer must first have authorization to access the audit as a reviewer. After accessing the audit, a summary viewer identifies all work papers ready for review and edited after review. The reviewer does not have to search through or remember specific file names as TeamMate takes the reviewer directly to any work paper. After review, the reviewer signs off the work paper by clicking on a "reviewed by" box located at each work paper screen or a "sign off" button on the TeamMate toolbar. The reviewer does not have to enter individual key strokes, as TeamMate automatically enters the appropriate electronic signature and date. At the same time, TeamMate updates the summary viewer. If the auditor is away from the office, the auditor can periodically send work paper files to the reviewer (e-mail is the preferred method as all TeamMate audit files are encrypted). After completing the review, the reviewer returns work paper files to the auditor, who merges the reviewed work papers and associated comments, if any, back to the original audit file.

If desired, TeamMate will incorporate work paper review checklists and allow a reviewer to prepare a support work paper specifying the nature, extent, and results of a review. However, the electronic "sign off" review method provides an automatic trail of all

audit reviews, and the electronic access and work paper review “sign off” features provide reasonable assurance that the reviewer is authorized access to work papers. The electronic signature is authentic and controlled.

Audit Evidence. TeamMate allows the user to describe client records in any fashion deemed appropriate to allow an experienced auditor to understand and examine the same records. TeamMate also includes Watermark scanning software. The Watermark software controls provide reasonable assurance scanned images are not altered or edited (reliability and security), and meet current requirements for acceptable evidence in courts of law.

Electronic Signature Integrity and Control. TeamMate incorporates an electronic signature feature that is unique to the signer, under the signer’s sole control, and verifiable.

Work Paper Storage. TeamMate controls prevent unauthorized access or changes to any audit work papers or files and provide data integrity equaling a paper document. Specifically, before an auditor can recall all audit files from storage and examine the files in human readable form, he or she must have a “read only” authorization. The audit administrator can authorize third party access to the file by assigning the reviewer as a “read only” team member.

Security. TeamMate passwords and permission levels control access to audit files, work papers, and the system itself. Specifically, a user cannot access an audit unless identified in TeamMate as a member of the audit team. Additionally, if a user is assigned “read only” access, that user can only read work paper files. For example, the system will not allow a “read only” user to prepare or edit a work paper or sign off as a “reviewer.” Watermark imaging software controls provide assurances that users cannot edit or otherwise alter documents. TeamMate files are encrypted to prevent unauthorized access. Electronic signatures generated within TeamMate are also encrypted.

An additional role known as “review-only” allows reviewers to sign off, create, and clear review notes but restricts reviewers from modifying the underlying document. Work papers cannot be modified outside of TeamMate; specifically, a user cannot change a Word/Excel document without first accessing the document through the TeamMate control hierarchy.

General Criteria

If a user wants to use Microsoft Word or Excel to prepare work papers, TeamMate will open (or “launch”) the application within the TeamMate system. When the applications are operating inside TeamMate, the user can create electronic cross references to and from the application files. If the user creates a work paper outside TeamMate, the

user can "import" the work paper into a TeamMate file and then create electronic references.

The user can establish cross references at specific points in documents or in individual spreadsheet cells. The user can also establish cross references at specific points in scanned image files or Excel spreadsheet files. All reference marks will move with the file (for instance, if the user renames the file). The user can also move reference marks from one place in a file to another place in the same file. TeamMate automatically generates the audit report and an exception (finding) report.

TeamMate provides for and accepts simultaneous user access and edits if the audit file is stored on a shared network drive. TeamMate also supports the concept of replication, which allows a disconnected user to work on any section and then merge the section into the master. TeamMate will identify incompatible merge entries with its full conflict detection and resolution feature.

Although unfinished work papers cannot be "blocked" from review, TeamMate's prepare/review status file identifies which work papers are ready for review. TeamMate's on-line storage/backup/recovery procedures prompt the user, when exiting TeamMate, to back up the audit. TeamMate also automatically saves all files each time the user closes out of a file.

TeamMate incorporates its own predefined templates and forms and accepts internally-developed templates and forms. Also, a single click can make any internally-developed Word or Excel document into a template available for subsequent use.

Software Requirements and Product Support Criteria

Software Requirements/Options. Windows 95 and Microsoft Office or Office 95. Price Waterhouse released the Office 97 Beta version in November 1997. TeamMate operates with any e-mail package that supports file attachments. To permit simultaneous access, users can store TeamMate files on a shared network drive. Users can also import any predefined templates, forms, and Word/Excel files into a TeamMate file

Hardware Requirements/Options. Minimum requirements are a 486.33 MHz processor with 16 MB of RAM and 15 MB of available hard drive for installation. Options include scanners, network hubs and cables to support peer-to-peer networks (mobile networks).

Product Support. Price Waterhouse provides TeamMate technical support from its technical support help desk, (813) 348-8160, Tampa, Florida. Users can also obtain technical support from any local Price Waterhouse office. TeamMate contains an on line help file providing information and instructions for using TeamMate features. Price Waterhouse offers two licensing programs: the regular program and the "ACE" program. The regular program offers classroom user training for \$2,000 per class and implementation

consulting for \$200 per hour. The ACE program includes initial user training and 40 hours of implementation consulting. Price Waterhouse will customize TeamMate for any client at the client's request; such requests are evaluated and charges are based upon negotiation between Price Waterhouse and the client.

Price Waterhouse sponsors user forums allowing internal and external users to input suggestions for future TeamMate versions. When Price Waterhouse accepts requests (which is often the case), Price Waterhouse will develop the features and make them available to all users at no additional cost.

COST

USERS	REGULAR PROGRAM	ACE PROGRAM
1-10	\$ 15,000	\$20,000
11-20	22,500	30,000
31-40	30,000	40,000
41-50	37,500	50,000
51-100	60,000	73,000
101-150	75,000	90,000
151-200	90,000	110,000
201-300	105,000	130,000
301-400	120,000	145,000
401-500	150,000	180,000
Over 500	\$300 per user	\$350 per user
Classroom User Training	\$2,000 per class	Included
Implementation Consulting	\$200 per hour	40 hours included
Telephone support/upgrades	One year included; 25% of regular program license fee per annum thereafter	Two years included; 25% of regular program license fee per annum thereafter

CONCLUSION

The AFAA pilot test group found TeamMate met most functional requirements and was relatively easy to learn. Most test group members appreciate TeamMate's approach to standardize the audit process and promote a "paperless" audit methodology. Preliminary results of the pilot test show TeamMate can complement and facilitate AFAA's local audit process and many requirements associated with its centrally-directed audit process. TeamMate also incorporates AFAA's own internally-developed software, meets current

GAGAS, and performs effectively with Microsoft Office application software. Additionally, the Price Waterhouse technical support group is committed to supporting and helping its users - potential and actual - and to maintaining TeamMate. AFAA is still evaluating TeamMate's functionality and operability with its centrally-directed audit process.

Appendix A
STUDY RESULTS MATRIX

A		B		C		D	
Agency or Company Name	AFAA	Deloitte & Touche	HUD IG	Price Waterhouse			
Product Name	AFAA Software	AS/2	IGAS	TeamMate			
Version	1997	Version 2.21	In Development	Version 3.0			
Purchase Price	No cost to requesting organization AFAA requires the requester execute a MOU to certify the organization will not use the software for commercial purposes.	1-20 \$20K 21-50 \$20.5-\$35K 51-100 \$32.3-\$42.8 Annual Maint (20% of purchase price)	No cost for software. HUD IG anticipates cost sharing arrangements for annual maintenance.	Regular: 0-10 \$15k 11-20 \$22.5k 21-30 \$30k 31-50 \$37.5k 51-100 \$60k 101-150 \$75k 151-200 \$90k 201-300 \$105k 301-400 \$120k 401-500 \$150k >500 \$300/user ACE: 0-10 \$20k 11-20 \$30k 21-30 \$40k 31-50 \$50k 51-100 \$73k 101-150 \$90k 151-200 \$110k 201-300 \$130k 301-400 \$145k 401-500 \$180k >500 \$350/user			
Workpaper Prep							
Follow Audit Flow	Yes	Yes. Document based and easy to follow	Yes	Yes			
Support Conclusions	Yes	Yes	Yes	Yes			
Properly Documented	Yes	Yes	Yes	Yes			
Reliable	Reliability not established by the system but by user integrity	Yes	Yes	Yes			Yes system general and application controls establish reliability
Controls Unauthorized Access	No	Yes	Yes	Yes			Yes

	A	B	C	D
Supv Review				
Initial & Date Each WP	Yes if user creates a template or other feature	Yes	Yes	Yes via electronic signature
Complete Checklist or	Yes if user creates	Yes	Yes	Yes if user creates
Memo w/nature, extent, & results of review	Yes if user creates	Yes	Yes	Yes if user creates
Audit Evidence				
Provides for adequately describing client records	Yes	Yes	Yes	Yes
Allows for scanning documented evidence	Yes but system does not include scanning software	Yes but system does not include scanning software	Yes	Yes; provides Watermark imaging software
Signature Control				
Ability to print hard copy of complete report and work papers	Yes	Yes	Yes	Yes
Electronic signature unique to signer	No	Yes	Yes	Yes
Electronic signature under the signer's sole control	No per above	Yes with system administrator	Yes	Yes with data administrator
Electronic Signature that is verifiable	No per above	Yes	Yes	Yes
Can encrypt signature	No per above	No	Yes	Yes
Workpaper Storage				
Can be examined in human readable form	Yes	Yes	Yes	Yes
Can be recalled from storage	Yes	Yes	Yes	Yes
Can provide data integrity that equals a paper document	No	Yes	Yes	Yes

	A	B	C	D
Min/Max Software Requirements/Options				
Auditor Workstation	Windows 3.11 or 95	Windows 95 Microsoft Excel 5.0c Microsoft Word 5.0c ACL - Optional Folio VIEWS 3.1a - Optional	IBM OS/2 Warp, Microsoft Windows 3.1, Windows 95, Windows NT, Apple Macintosh, Novell NetWare, and UNIX platforms	Windows 95 or Windows NT 3.5, 4.0
Network capability	Any e-mail package that supports file attachments	Yes	Yes	Any e-mail package that supports file attachments
Import capability	Yes	Yes	Yes	Yes
Interface with other software	Microsoft Office or Office 95	Yes	Yes	Microsoft Office, Office95 or Office97(Beta) TWAIN compliant scanner
Hardware Requirements/Options				
Auditor workstation	486.33	Pentium-based PC 16 Megabytes of RAM minimum 800 megabytes or more of hard disk storage CD-ROM (suggested but not required)	486, 40 Mhz, 12 MB memory, 200 MB HDD.	486 33 MHz PC 15MB available hard drive to install; 16 MB of RAM
Server	Can install on, and allow user access, via a server or EBBS	Optional	486, 66 Mhz, 32 MB memory, 1 GB HDD.	Can store TeamMate files on shared network drive to permit simultaneous user access

	A	B	C	D
Product Support				
Technical support	No	Toll-free telephone support provides assistance during regular business hours	Support is available on a cost-share basis.	Yes (813) 348-8160 Tampa FL - main help desk; also, any local PW office
On-line support	Yes	Yes	Negotiable	Yes
Training	No	Yes. 3 days of on-site training and implementation assistance and a comprehensive self-study tutorial guide		Yes Reg - \$2k/class Implement Consulting - \$200/hr; additional by negotiation ACE- Includes classroom user training and 40 hours of implement consulting Yes @ programming cost
Company modify product for client	No; will provide program code	Yes	Yes	Yes @ programming cost
Upgrades	Will provide upon request	Included in annual maintenance fee	Negotiable	Regular: 1 yr included; 25% of purch price per annum thereafter ACE: 2 yrs incl; 25% of REGULAR program fee per annum thereafter
Security				
Password protected	No	Yes	Yes	Yes
Can user alter scanned client exhibits	N/A	Yes, if object not embedded	No	Not if user scans in with TeamMate's Watermark scanning feature
Can anyone alter workpapers	Yes	Yes (plan to change in next version)	No	Only if authorized via permission levels
Does system control access to the audit	No	Yes	Yes	Yes
Does system control access to each document	No	No. Team leader controls access to the audit	Yes	Yes
Does system define access levels	No	No	Yes	Yes
Can reviewed workpapers be deleted	Yes	Yes	No	Not after marked for archival
Does system provide edit history of each work paper	No	Yes, but limited to last 4 preparers and reviewers	Yes	Yes
Does system provide encrypted transmission	No	Yes	Yes	Yes

	A	B	C	D
General Features				
Cross reference between applications	No	Yes	Yes	Yes
Cross reference to spread sheets	No	Yes	Yes	Yes
Cross references to spreadsheet cells	No	Yes	No	Yes
Cross references move with the file	N/A	Yes	Yes	Yes
Automatically generate audit report	No	Yes	No	Yes
Provides for/accepts resolution of simultaneous edits	No	Yes	Yes	Yes
Can unfinished workpaper be blocked from review	No	Yes	No	Not "blocked" but unfinished workpapers are identified as "not completed"
File export feature	Can attach files to e-mail messages	Yes	Yes	Yes
File import/ summarization feature	No	Yes	Yes	Will import all or selected parts of an audit file. Developing summarization feature per AFSA request, has filtering capabilities for viewing results for each "component group"
On-line storage/backup recovery capabilities	User must save workpapers or rely on Microsoft "automatic save;" system does not "trigger" a backup procedure	Yes	Yes	Yes; system automatically triggers a backup procedure and automatically saves after closing any file
Incorporates predefined templates and forms	Yes	Yes	Yes	Yes

Appendix B
SURVEY RESULTS MATRIX

Audit Organization	Not Using AWP	Plan to use AWP	Using AWP	AWP Product
Air Force Audit Agency		X	X	AFAA Software (using) TeamMate (testing) procurement pending
Amtrak		X		Lotus Domino
Appalachian Regional Commission	X			N/A
Army Audit Agency	X			N/A
Central Intelligence Agency	X			N/A
Consumer Product Safety Commission	X			N/A
Corporation for National and Community Service	X			N/A
Corporation for Public Broadcasting		X		Unknown
Defense Contract Audit Agency			X	TEWPs -Tailored Electronic Working Papers
Defense Information Systems Agency	X			N/A
Defense Intelligence Agency		X		Unknown
Department of Agriculture	X			N/A
Department of Commerce			X	ATB (Accts Trial Balance) Still print wps
Department of Defense	X			N/A
Department of Education		X	X	DOE system. Wordperfect based. We are also currently in the preliminary planning phase of transitioning to Lotus Notes, the system used by the Federal Reserve IG.
Department of Energy	X			N/A
Department of Health & Human Services	X			N/A
Department of Housing and Urban Development		X		HUD IG Audit System
Department of Interior	X			IDEA
Department of Justice	X			N/A
Department of Labor			X	DOL Audit System (for financial statement audits only)
Department of State	X			N/A
Department of Transportation	X			N/A
Department of the Treasury		X		N/A
Environmental Protection Agency			X	LOTUS AAS modified by EPA OIG
Equal Employment Opportunity Commission	X			N/A
Federal Bureau of Investigations			X	Audit Program Generator
Farm Credit Administration		X		Beginning FY 98 will use Audit Information Management software provided by the OIG Federal Reserve Board.
Federal Deposit Insurance Corporation		X		Pilot testing Lotus Notes Automated Workpapers.
Federal Election Commission	X			N/A
Federal Emergency Management	X			N/A
Federal Labor Relations Authority	X			N/A
Federal Maritime Commission	X			N/A
General Accounting Office			X	PC-DOCS
Legal Services Corporation	X			N/A

Audit Organization	Not Using AWP	Plan to use AWP	Using AWP	AWP Product
National Credit Union Administration	X			N/A
National Endowment for the Arts	X			N/A
National Endowment for the Humanities	X			N/A
National Labor Relations Board	X			N/A
National Aeronautical and Space Agency		X		TeamMate
Naval Audit Service	X			N/A
Nuclear Regulatory Commission	X			N/A
Office of Personnel Management		X		Currently testing TeamMate
Panama Canal Commission	X			N/A
Peace Corps	X			N/A/
Pension Benefit Guaranty Corporation	X			N/A
Railroad Retirement Board	X			N/A
Securities and Exchange Commission	X			N/A
Small Business Administration	X			N/A
Smithsonian Institution	X			N/A
Social Security Administration	X			N/A
Tennessee Valley Authority	X			N/A
U S Postal Service		X		TeamMate

Appendix C
PARTICIPATING ORGANIZATIONS

Air Force Audit Agency
AMTRAK Inspector General
Appalachian Regional Commission Inspector General
Army Audit Agency
Central Intelligence Agency Inspector General
Consumer Product Safety Commission Inspector General
Corporation for National and Community Service Inspector General
Corporation for Public Broadcasting Inspector General
Defense Contract Audit Agency
Defense Information Systems Agency
Defense Intelligence Agency
Department of Agriculture Inspector General
Department of Commerce Inspector General
Department of Defense Inspector General
Department of Education Inspector General
Department of Energy Inspector General
Department of Health and Human Services Inspector General
Department of Housing and Urban Development Inspector General
Department of the Interior Inspector General
Department of Justice Inspector General
Department of Labor Inspector General
Department of State Inspector General
Department of Transportation Inspector General
Department of the Treasury Inspector General
Environmental Protection Agency Inspector General
Equal Employment Opportunity Commission Inspector General
Farm Credit Administration Inspector General
Federal Deposit Insurance Corporation Inspector General
Federal Bureau of Investigation
Federal Election Commission Inspector General
Federal Emergency Management Agency Inspector General
Federal Labor Relations Authority Inspector General
Federal Maritime Commission Inspector General
General Accounting Office
Legal Services Corporation Inspector General
National Aeronautical and Space Agency Inspector General
National Credit Union Administration Inspector General
National Endowment for the Arts Inspector General
National Endowment for the Humanities Inspector General
National Labor Relations Board Inspector General
Naval Audit Service
Nuclear Regulatory Commission Inspector General
Office of Personnel Management Inspector General

Panama Canal Commission Inspector General
Peace Corps Inspector General
Pension Benefit Guaranty Corporation Inspector General
Railroad Retirement Board Inspector General
Securities and Exchange Commission Inspector General
Small Business Administration Inspector General
Smithsonian Institution Inspector General
Social Security Administration Inspector General
Tennessee Valley Authority Inspector General
US Postal Inspection Service Inspector General

**Appendix D
GOVERNMENT CONTACTS**

Audit Organization	AWP Product	Contact Name	Phone Number	E-mail Address
Air Force Audit Agency	AFAA Software (using) TeamMate (testing) procurement pending	Patricia Pickett	(703) 696-9263	Pickett@af.pentagon.mil
Amtrak	Lotus Domino	Vipul Doshi	(202) 906-4619	uvd0@w7.amtrak.com
Appalachian Regional Commission	N/A	Hubert Sparks	(202)-884-7675	HSPARKS@ARC.GOV
Army Audit Agency	N/A	Holly Williams	(703) 681-4499	williamh@aaa.army.mil
Central Intelligence Agency	N/A	Philip D. Reichers	(703) 281-8523	philipdr@worldnet.att.net
Consumer Product Safety Commission	N/A	Mary B. Wyles	(301) 504-0573	cpssc-ig@cpsc.gov
Corporation for National and Community Service	N/A	Bill Anderson	(202) 606-5000 X395	wanderso@cns.gov
Corporation for Public Broadcasting	Unknown	Michael A. Bianco	(202) 879-9663	mbianco@cpb.org
Defense Contract Audit Agency	TEWPs - Tailored Electronic Working Papers	Tom Cline	(703) 767-3290	tccline@hq1.dcaa.mil
Defense Information Systems Agency	N/A	Thomas J. Nicholas	(703) 275-5485	NICHOLAT@NCR.DISA.MIL
Defense Intelligence Agency	Unknown	Susan D. Boyd	(703) 588-0821	
Department of Agriculture	N/A	Marshall Grimes	(202) 720-4536	Marshall@org.usda.gov
Department of Commerce	IDEA ATB (Accts Trial Balance) Still print wps	Alison Horowitz	(703) 603-0301	ahorowitz@ix.netcom.com
Department of Defense	N/A	Dahnelle Alexander	(703) 604-9149	aalexander@dodig.osd.mil
Department of Energy	N/A	Stan Sulak	(202) 586-1950	Stanley.Sulak@HQ.DOE.GOV
Department of Education	DOE System (Using) Lotus Notes (Transitioning)	Ray Johnson	(202) 205-9534	Ray-Johnson@ed.gov
Department of Health & Human Services	N/A	Helen James	(202) 205-9119	Hjames@os.dhhs.gov
Department of Housing and Urban Development	HUD IG Audit System	Barry A. Kahn	(202) 708-3444 X147	Barry_A_Kahn@hud.gov
Department of Interior	N/A	Diann Sandy	(303) 236-9243	Diann_Sandy@IOS.DOI.GOV
Department of Justice	N/A	Donna Roberts	(202) 616-4668	Daroberts@eros.com
Department of Labor	DOL Audit System (for financial statement audits only)	Joseph Ganci		jganci@oig.dol.gov
Department of State	N/A	Andrea M. Leopold	(703) 284-2652	
Department of Transportation	N/A	Rebecca Long	(202) 366-1488	

Department of the Treasury			Joe Lawson	(202) 927-6345	lawsonj@oig.treas.gov
Environmental Protection Agency	LOTUS AAS modified by EPA OIG		Leanna Terrell	(202) 260-3621	terrell.leanna@epamail.epa.gov
Equal Employment Opportunity Commission	N/A		Len Worley	(202) 663-4372	
Farm Credit Administration	Audit Information Software		Elden Stoehr, IG		
Federal Bureau of Investigation	Audit Program Generator		Danielle E. Piper	(202) 324-2391	
Federal Deposit Insurance Corp	Lotus Notes Workpaper		Eugene P. Szczyński	(202) 416-2502	Eszczeniowski@FDIC.Gov
Federal Election Commission	N/A		Jon Hatfield	(202) 219-1985	jhatfield@fec.gov
Federal Emergency Management	N/A		Fuss Symons	(202) 646-3904	RSymons@FEMA.GOV
Federal Labor Relations Authority	N/A		Alan Hansen	(202) 482-6570	
Federal Maritime Commission	N/A		Jerome Johnson	(202) 523-5863	jeromej@fmc.gov
General Accounting Office	PC-DOCS		Mike Dombrowski	202-512-3336	dombrowskim.oimc@gao.gov
Legal Services Corporation	N/A		Alexis M. Stowe		stowea@smp.lsc.gov
National Credit Union Administration	N/A		William A. DeSarno	(703) 518-6350	wdesarno@nouis.gov
National Endowment for the Arts	N/A		Edward Johns	(202) 682-5466	None
National Endowment for the Humanities	N/A		Charles Garfinkel	(202) 606-8353	cgarfinkel@neh.fed.us
National Labor Relations Board	N/A		Emil T. George	(202) 273-1966	
National Aeronautical and Space Agency	TeamMate		Ronald Dill	(757) 864-8126	R.dill@larc.nasa.gov
Naval Audit Service	N/A		Johnny R. Camp	(703) 607-1915	jcamp@audit.navy.mil
Nuclear Regulatory Commission	N/A		Judy Leonhardt		
Office of Personnel Management	TeamMate 97 (piloting)		Carol Ries	202-606-1881	carries@opm.gov
Panama Canal Commission	N/A		Emilio Williams	011-507-272- 3142	IG-EWB@pancanal.com
Peace Corps	N/A/		John Reavill	(202) 606-3320	jreavill@peacecorps.gov
Pension Benefit Guaranty Corporation	N/A		Joseph Zeilman	(202) 326-4030 x3438	
Railroad Retirement Board	N/A		Richard Erickson	(312) 751-4338	
Securities and Exchange Commission	N/A		Walter Stachnik	(202) 942-4460	
Small Business Administration	N/A		John Dye	(202) 205-7431	john.dye@sba.gov
Smithsonian Institution	N/A		Brian Lowe Kevin E. Kreitz	(202) 287-3326	blowe@sivm.si.edu kkreitz@sivm.si.edu
Social Security Administration	N/A		Jack H. Trudel	(510) 970-1733	jack.trudel@ssa.gov
Tennessee Valley Authority	N/A		Deborah Thorniton	(423) 632-6058	dthorniton@tva.gov
U S Postal Service	TeamMate		Bruce T. Alsop	(202) 314-2631	balsop@email.usps.gov

Appendix E
Team Member Bios

Dahnelle Alexander

Ms. Alexander is a Certified Information Systems Auditor, for the Office of Inspector General, Department of Defense. She is currently responsible for performing general/application control and Year 2000 audits. Ms. Alexander is a Certified Public Accountant in the state of Virginia and is a member of the Information Systems Audit and Control Association.

Ms. Alexander began her career in May 1994 as an auditor trainee. Throughout her employment, she attained experience and training in electronic commerce and contract management audits. Ms. Alexander has also performed financial statement audits and reviews during her employment as a junior auditor at a public accounting firm.

Ms. Alexander has received numerous awards during her career. While at the Inspector General, Department of Defense, she received outstanding performance awards, a superior accomplishment award, was a team member of the 1997 Audit Report of the Year Recommending Streamlining Action, and the Contract Management Auditor Trainee of the Quarter.

Ms. Alexander graduated Cum Laude from Mary Washington College in 1993 with a Bachelor of Science in Business Administration. Her education was complimented with work experience throughout high school and college.

A. LEE BATTERSHELL

Ms. Battershell is on the staff of Battershell & Co CPAs, Kent, Washington. She is on the Board of directors for the Association of the Industrial College of the Armed Forces, and for the Industry Conference Board. She also serves as a research team member for the Institute of Internal Auditors.

Ms. Battershell served as the Director, Policy, Oversight, & Systems, Air Force Audit Agency (AFAA); as Associate Director, Department of State; as Program Manager, Department of Defense Inspector General; and as Research Fellow Industrial College of the Armed Forces (ICAF).

In addition to forming policy, developing organizations, directing audits and directing system management, Ms. Battershell directed management of two development programs—the automated work paper system and the automated management information system. Ms. Battershell co-authored the publication “Acquisition Alerts for Program Managers,” authored the article “Technology Approach: DoD versus Boeing, A Comparative Study,” and authored a book, “The C-17 versus the 777.”

During her career Ms. Battershell chaired several boards and committees including the Federal Audit Executives Council on Auditing in a Paperless Environment, the Communications Systems Requirements Board, the Information Processing Group, and the Workforce Diversity Committee. She served on the President’s Council for Integrity and Efficiency for Education, and served on a joint Air Force/Army board to improve technology use in the workplace.

Ms. Battershell graduated cum laude from California State University with a Bachelor of Science in Business Administration. She has a Master of National Resource Management from the Industrial College of the Armed Forces. Ms. Battershell is currently working on a Master of Science in Business Administration from Central Michigan University.

The Defense Acquisition University awarded Ms. Battershell the Senior Acquisition Professional Program Manager certification. She is a certified Acquisition Professional Financial Management Comptroller, and a certified Government Financial Manager. In addition to many performance awards Ms. Battershell received the Federal Woman of the Year Award, and the President’s Award for Meritorious Service.

Ms. Battershell and her husband, Arnel, have two sons, a daughter and five grandchildren.

Barry A. Kahn

Barry began his Government career with the U.S. General Accounting Office in Washington, DC. After starting in their General Government Division, he soon moved over to GAO's Technical Assistance Group to specialize in Information Systems Auditing. While at GAO, Barry had the opportunity to review automated systems in both civilian and defense organizations thus obtaining a wide range of experience within many different computer environments.

After several years with GAO, Barry left to work within the IG community. He has had the opportunity to work with several different Inspector General organizations including the Environmental Protection Agency, the Department of Health and Human Services, and the Department of Housing and Urban Development, where he is currently employed.

At HUD, he is a member of the Information Systems (IS) Audit Division, which is within their Office of Audit. As the most senior and experienced IS Auditor in the division, he is relied upon to advise and directly support the division director in all operational matters.

Barry became interested in bringing automation to the working paper process, and initiated a project to explore the possibilities of using such a system within his own division. After determining its feasibility, the project was begun with Barry as project leader. He designed the system, now called the IG Audit System (IGAS), and successfully led its development. He is now overseeing IGAS testing within the IS Audit Division.

PAMELA DILL McCOY

Pamela Dill McCoy, a Headquarters Staff Auditor at the Air Force Audit Agency's Policy, Oversight, and Systems Division, Directorate of Operations, Arlington, Virginia, manages the Agency's paperless audit initiative and coordinates Federal accounting and auditing standards. Mrs. McCoy accepted this assignment after previous appointments at Andrews Air Force Base, Maryland, and Los Angeles Air Force Base, California. While at Andrews, Mrs. McCoy advised the Comptroller, 11th Wing, Pentagon, on the development of the Federal Automated System for Travel. Mrs. McCoy earned a Bachelor of Science in Business Administration (Accounting) from Old Dominion University, Norfolk, Virginia and is a licensed Certified Public Accountant and Certified Internal Auditor.

Mrs. McCoy is a member of the American Institute of Certified Public Accountants, the Virginia Society of CPAs, the Institute of Internal Auditors, the American Society of Military Comptrollers, and the Senior Professional Women's Association. Mrs. McCoy also serves on the Industry and Government Committee and the Accounting and Audit Policy Committee of the Northern Virginia CPA Society.

Mrs. McCoy will receive a Master of Science in Accountancy (Information Systems) from George Mason University, Fairfax, Virginia, in May 1998. Mrs. McCoy and her husband, John Eugene II, CPA, live in Manassas, Virginia.

CAROL A. RIES

Carol A. Ries is an Auditor-in-Charge at the Office of Personnel Management, Office of the Inspector General, Agency Audits Division in Washington, DC.

Ms. Ries conducts audits of the Office of Personnel Management's Salaries and Expenses and Revolving Fund Financial Statements. Ms. Ries also heads the Office of Inspector General's Audit Automation Team which researches methods to automate the audit process. Ms. Ries earned a Bachelor of Science in Business Administration with a concentration in Accounting from Millersville University, Millersville, Pennsylvania.

Ms. Ries is a member of the Institute of Internal Auditors and the Association of Government Accountants. Ms. Ries has been with the Office of Personnel Management, Office of the Inspector General for more than 7 years.

Glossary of Acronyms and Terms

AAPS. Automated Audit Program Software. Software designed to automate preparation and control of audit work papers.

AAS. Automated Audit System. A software to automate the work paper process. AAS is a joint Lotus and Nations Bank product.

AFAA Software. A software product composed of templates, forms, audit instructions, and guides. AFAA Software is an Air Force Audit Agency product.

AFAA. Air Force Audit Agency

AS/2. Software program to automate the work paper process. AS/2 is a Deloitte and Touche product.

D&T. Deloitte and Touche Certified Public Accounting Corporation.

HUD-IG. Department of Housing and Urban Development, Inspector General

IGAS. Inspector General Audit System. IGAS is a HUD-IG product.

OPM-OIG. Office of Personnel Management Office of Inspector General.

PW. Price Waterhouse Certified Public Accounting Corporation.

TeamMate. Software program to automate the work paper process. TeamMate is a Price Waterhouse product.