Audit Report

OFFICE OF THE INSPECTOR GENERAL

DOD IMPLEMENTATION OF ELECTRONIC COMMERCE IN CONTRACTING FOR SMALL PURCHASES

Report No. 96-129 May 24, 1996

Department of Defense

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Acronyms

ASC	Accredited Standards Committee
EC/EDI	Electronic Commerce/ Electronic Data Interchange
DISA	Defense Information Systems Agency
FACNET	Federal Acquisition Computer Network
NEP	Network Entry Point
VAN	Value-Added Network

INSPECTOR GENERAL
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MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR ACQUISITION AND TECHNOLOGY
ASSISTANT SECRETARY OF THE NAVY (FINANCIAL MANAGEMENT AND COMPTROLLER)
ASSISTANT SECRETARY OF THE AIR FORCE (FINANCIAL MANAGEMENT AND COMPTROLLER)
DIRECTOR, DEFENSE INFORMATION SYSTEMS AGENCY
DIRECTOR, DEFENSE LOGISTICS AGENCY
AUDITOR GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Review of DoD Implementation of Electronic Commerce in Contracting for Small Purchases (Project No. 5CA-3002)

Introduction

We are providing this report for your information and use. This report identifies and summarizes issues related to the implementation of electronic commerce within DoD. Both the DoD Electronic Commerce Office within the Office of the Deputy Under Secretary of Defense (Acquisition Reform) and the Defense Information Systems Agency (DISA) are currently addressing many of the issues identified. Therefore, the purpose of this report is to compile those issues identified, to identify efforts being made in those areas, and to identify other audits and reviews being performed on specific topics.

Review Results

The review identified a series of issues involved in the implementation of electronic commerce within DoD. The issues were identified during a review of the implementation of the Federal Acquisition Computer Network (FACNET) at DoD buying organizations, gateways, network entry points (NEPs), and value-added networks (VANs). FACNET is a Government-wide electronic commerce/electronic data interchange (EC/EDI) system architecture for acquisition. Implementation of FACNET is a requirement of the Federal Acquisition Streamlining Act of 1994. See Enclosure 1 for glossary of terms.

The issues identified include:

o realization of the "single face to industry" concept,

o adequacy of the transmission of data by the DoD FACNET infrastructure,

o implementation of security controls,

- o level of vendor participation,
- o adequacy of management controls for FACNET transactions, and
- o adequate development of FACNET implementation plans.

The Deputy Under Secretary of Defense (Acquisition Reform) and DISA are aware of the issues and are implementing corrective actions. The purpose of this report is to summarize the issues. In addition, the Office of the Inspector General, DoD, is currently performing audits on the implementation of FACNET. Those audits will address some of the issues identified during this review.

Review Objectives

The overall objective was to review the DoD implementation of electronic commerce for small purchases. The specific objectives were to identify potential impediments to timely and effective implementation of EC/EDI and to identify areas for future audit efforts.

Scope and Methodology

Scope. The sample sites selected for review included eight buying organizations, four gateways, two NEPs, and eight VANs. Specific organizations to be visited for our review were judgmentally selected as follows:

- o buying organizations certified as of July 1995 and having a high volume of small purchases reported in FY 1994,
- o at least one gateway from each Military Department,
- o both NEPs, and
- o both small and large VANs based on their responsiveness to our survey conducted in July 1995.

At each of the organizations visited, we conducted interviews with appropriate personnel to discuss their experiences using FACNET. We solicited ideas for improvements to FACNET. We reviewed files to determine the number of solicitations, bids received, and awards made using FACNET. We also discussed FACNET implementation with responsible personnel at DISA, the Military Departments, and trading partners.

Limitation to Review Scope. Our review was limited to discussions with personnel regarding FACNET implementation and documentation provided during the discussions. Therefore, we did not assess the adequacy of the management control program as it applies to the review objectives. Ongoing and future audits performed by the Inspector General, DoD, will include a review of the management control program.

Review Period, Standards, and Locations. This program review was performed from July through December 1995 in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. We did not use computer-processed data or statistical sampling procedures for this audit. Enclosure 4 lists the organizations visited or contacted.

Prior Audits and Congressional Testimonies

The Inspector General, DoD, performed one audit concerning the audit objectives. In addition, the General Accounting Office has presented testimonies to Congress concerning the audit objectives. See Enclosure 3 for details on prior audits and congressional testimonies.

Review Background

The Federal Acquisition Streamlining Act. The Federal Acquisition Streamlining Act of 1994 authorized simplified acquisition procedures for procurements up to $100,000 and establishes a Government-wide FACNET. FACNET is a communications network that DoD and civilian organizations are using to coordinate EC/EDI transactions from their individual buying organizations to present a single face to industry. A single face to industry means that electronic transactions are available in the same format regardless of the Federal agency originating the transactions. The Act required Government-wide FACNET capability to be implemented no later than January 1, 2000. The previous implementation deadline was January 1997.

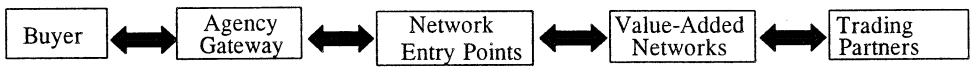
Proposed revisions to the Federal Acquisition Regulation could allow buying organizations to use alternative electronic commerce vehicles such as electronic bulletin boards and electronic catalogs. Specifically, the proposed revisions to the FAR state that FACNET should be used where practicable and cost-effective.

In addition, the FY 1996 Authorization Act eliminated the requirement for a buying organization to be FACNET certified to use simplified acquisition procedures for procurements up to $100,000.

DoD FACNET Infrastructure. The overall function of the DoD FACNET infrastructure (the Infrastructure) is to provide widespread public notice of contract opportunities issued by the Government, through privately owned VANs, and for the Government to receive bids and award contracts for supplies and services through an electronic environment. The primary benefit of FACNET is the sharing of a common infrastructure and, as a result, reducing overall cost and access to the widest collection of vendors who do business with the Government.

The Infrastructure is composed of buying organizations, gateways, NEPs, VANs, and trading partners. Buying organizations send a transaction through an application system to the supporting gateway. After the gateway performs

translation, archiving, and other functions, the information is transmitted to a NEP. The NEP receives the transactions and transfers them to VANs that have been certified and connected to the Infrastructure. VANs distribute the information to their trading partners. The trading partners return transactions to the buying organization in the reverse order.



DoD FACNET Infrastructure

DISA is changing the current Infrastructure to combine the gateway and NEP function into electronic commerce processing nodes. DISA anticipates that the new Infrastructure will be fully implemented between September 1996 and March 1997.

DISA is responsible for the implementation of initial FACNET capability including defining, operating, and monitoring the performance, capabilities, and capacity of all portions of the Infrastructure. DISA is also responsible for providing day-to-day system network management and policies, procedures, and standards of operation.

Discussion

The Federal Acquisition Streamlining Act of 1994 calls for the creation of a Government-wide FACNET by January 1997 (later changed to January 1, 2000). The purpose of the network was to automate the labor-intensive, paper-based acquisition system, to cut Federal procurement cost, to speed up delivery times, and to increase procurement opportunities for small businesses with the Government. Although initiatives have been made for the full implementation of FACNET, the system has not achieved its full implementation goal. Some of the obstacles hindering full implementation are that:

o the "single face to industry" concept has not been realized,

o the Infrastructure has had problems in adequately transmitting data,

o FACNET transactions are not properly secured to ensure the validity of transactions or the protection of proprietary information,

o vendors are not fully participating in FACNET implementation,

o management controls are not adequate for tracing FACNET transactions, and

o implementation plans were not fully developed before FACNET inception.

The Deputy Under Secretary of Defense (Acquisition Reform) has expended considerable effort with limited resources to accomplish the implementation of FACNET within a short time frame. Problems are to be expected when a huge undertaking such as developing and implementing FACNET is required to be accomplished quickly. The Deputy Under Secretary of Defense (Acquisition Reform) needed time to identify and clarify roles and responsibilities, develop policy, and implement FACNET. The Deputy Under Secretary of Defense (Acquisition Reform) is actively working to address and resolve many of the issues identified that must be addressed for the implementation of FACNET to be successful.

Single Face to Industry

According to DoD buying organizations, VANs, and trading partners, the single face to industry is not a reality. The primary goal of the standard Infrastructure is to support a "single face to industry." A single face to industry means that the electronic transactions must be available in the same format regardless of the Federal agency originating the transaction. Therefore, different automated information systems employing dissimilar technologies must issue transactions in exactly the same manner. As a result, the single face to industry requires standardized data elements, transaction sets, and addressing schemes to be used by Government agencies. Also, the central contractor registry and the VAN license agreement should be standardized to present a single face to vendors and trading partners. Impediments hindering the single face concept include the existence of multiple standards and DoD implementation conventions.

Data Standardization. In 1979, the American National Standards Institute chartered the Accredited Standards Committee (ASC) X12 to develop uniform standards for electronic data interchange of business transactions. The ASC X12 is administered by a nonprofit organization, the Data Interchange Standard Association. Each year, the Data Interchange Standard Association publishes the entire ASC X12 standards in a publication called a release. Releases are draft standards used on a trial basis. The purpose of the committee publishing those releases is to put current ASC X12 approved draft standards into the hands of users on a more frequent basis. DoD and DISA have approved the use of multiple releases for FACNET. This procedure can be costly because trading partners and VANs have to support various releases of the standards to do business with the Government. Further, many businesses feel that the various standards available are confusing and deter the single face concept.

Implementation Conventions. The ASC X12 standards are seldom used in their entirety. For this reason, DoD has written a series of implementation conventions, which are subsets of ASC X12 standards. The conventions describe the precise manner in which DoD intends to use the ASC X12 standards with its trading partners. VANs must enable interested trading partners to receive and send various DoD implementation conventions

for the ASC X12 standards. Some VANs expressed concerns that the Infrastructure is not assuring that transmitted data are in compliance with the American National Standards Institute as shown by the transmission to VANs of noncompliant transactions. In addition, some DoD procurement offices are creating their own implementation conventions. According to DISA personnel, the new VAN license agreement will limit the standards allowed to be used and that should help reduce the concerns about implementation conventions. However, until the existing various legacy systems that are used to support FACNET are upgraded, the various standards and implementation conventions will remain.

DoD FACNET Infrastructure

The Infrastructure has had problems in adequately transmitting data. The Infrastructure is the communications and computer systems architecture that transmits procurement data from buying organizations to trading partners. The primary goal of the Infrastructure is to support a single face to industry in the most economical manner. DoD is still working to implement the Infrastructure and resolve problems identified. The problems identified include:

o transmission of data through the Infrastructure,

o responsiveness to trouble tickets,

o adequacy of the certification process for VANs and buying organizations,

o usefulness of the central contractor registry, and

o accuracy of the number of FACNET transactions being reported to the Deputy Under Secretary of Defense (Acquisition Reform).

Experiences With Data Transmission. Buying organizations and VANs experienced problems with the adequate transmission of data through the Infrastructure. Bids were not being transmitted to the buying organization in a timely manner. Buying organizations and VANs stated that bids are submitted before the closing dates on requests for quotes. However, connection problems at the NEP may cause the buying organization to receive bids after the closing date. Also, VANs have reported that they often review requests for quotes from buying organizations late or with a one-day response time because of gateway or NEP downtime. In addition, the trading partners stated that they do not always receive requests for quotes, and bids have gotten lost.

Delays and Monitoring Procedures. Some of the transmission problems may be the result of delays in data transmission, a lack of monitoring procedures, and the NEP having periods, which sometimes last for hours, when it had no connection to the gateway. For example, personnel at the Mechanicsburg, Pennsylvania, gateway indicated that the gateway lacked monitoring procedures for incoming transmissions to facilitate notifying

DoD buying organizations and NEPs when data have not been transmitted accurately or in a timely manner, or when data have been lost and need to be retransmitted.

DISA is working towards correcting the transmission problems. The new Infrastructure, to be implemented between September 1996 and March 1997, will include system monitoring of incoming transactions. According to DISA personnel, the system monitoring feature will visibly identify transmission problems to the electronic commerce processing nodes administrator, and as a result it will allow for quick corrective action.

Protests. The lack of gateway procedures and the lack of a notification system for transmission failures result in transactions transmitted late or not transmitted at all. Transmission failures because of connection, procedure, and system problems could result in trading partners filing protests against the Government for late and lost transactions. However, the number of protests, to date, has not been substantial in comparison to the volume of transactions. Nevertheless, the cost benefit to the Government is minimized when the buying organization awards the contract to a contractor who is not the lowest bidder and the lowest bidder files a protest. New electronic commerce processing nodes monitoring procedures should help identify problems before they result in protests.

Responsiveness to Trouble Tickets. Buying organizations and VANs were experiencing problems with the trouble ticket process put in place to allow FACNET participants to report problems. From June 16 through November 13, 1995, 2,163 trouble tickets were reported to the DISA customer service center in Ogden, Utah. The customer service center is responsible for receiving and researching the cause of reported transaction problems. Buying organizations and VANs reported that:

- o assistance was lacking for resolving trouble tickets,
- o the customer service center closed trouble tickets prematurely, and
- o no feedback mechanism existed for lost trouble tickets or to convey resolution results.

DoD buying organizations stated that they no longer use the customer service center to resolve issues with transaction problems because of the problems identified. DISA is attempting to address the trouble ticket problems. According to DISA, trouble tickets have been reduced to less than 7 percent of the FACNET transactions. In addition, the electronic commerce processing nodes, the FACNET redesign, will have a system monitoring feature that will help identify problem areas before they result in trouble tickets.

The FACNET redesign should reduce the systemic problems identified that include an inability to track transactions thru FACNET, lost and late transactions, and lack of acknowledgement for the receipt of transactions. DISA is currently testing the electronic commerce processing nodes but DISA

has not established milestones for their implementation. Until the electronic commerce processing nodes are in place, the systemic problems identified will continue.

The redesign may not resolve all the systemic problems; However, such efforts should both reduce the trouble ticket workload and improve user confidence in FACNET.

Personnel Training, Expertise, and Availability. VANs question the adequacy of training and expertise of customer service center personnel on technical issues, and they stated that the personnel were not always available when needed because of time-zone differences. According to DISA personnel responsible for resolving trouble tickets, DISA provided no training on the trouble ticket process because the process had to be implemented so quickly.

Liability for Lost Transactions. Because of problems with trouble tickets not being adequately resolved, a question arises regarding who is liable for lost transactions through the Infrastructure. A large portion of transaction problems reported by trouble tickets include lost transactions.

In Inspector General, DoD, Project No. 5CA-3002.01, "Audit of the Defense Information System Agency Management of Trouble Tickets," we are examining the effectiveness of the trouble ticket process by identifying problem areas that, if corrected, would result in fewer trouble tickets. We are also evaluating user satisfaction with corrective actions that DISA took on reported problems.

Certification Process. Questions have been raised on the adequacy of the certification process for VANs and buying organizations. Before transmitting data through the Infrastructure, both VANs and buying organizations must be FACNET certified. As of January 1996, 25 VANs were certified and 14 companies were awaiting certification. As of February 1996, 227 DoD buying organizations were FACNET certified. This represents 93 percent of the potential 244 installations within DoD required to implement FACNET. The 227 DoD buying organizations include Army, Navy, and Air Force organizations. No Defense Logistics Agency sites have been certified as of February 1996. The 244 installations also account for 80 percent of DoD small purchases.

VAN Certification. The VAN certification process establishes the terms and conditions for doing business with the Government. To encourage VAN participation in FACNET, certification requirements were minimal early in the developmental stages. The VAN certification process consists of:

- the VAN signing the VAN license agreement,
- DISA reviewing business qualifications,
- DISA performing communications testing of the VAN, and

o DISA signing the VAN license agreement after all the previous steps have been completed.

In Inspector General, DoD, Project No. 6CA-0019, "Audit of Certification and Management of Value-Added Networks," we are evaluating questions raised, both by VANs themselves and by other FACNET participants. Questions raised include whether DISA has established an adequate Government VAN certification process and whether DISA adequately monitors and enforces the VAN license agreement. Preliminary results indicate that more than 50 percent of the certified VANs lacked adequate financial resources and DISA was not monitoring VANs for an internal quality monitoring program, audit trails, and disaster recovery. In addition, VANs felt that the current certification process was not adequate to ensure that companies were capable of handling the transactions workload that would be required for the full implementation of FACNET.

DISA is in the process of revising the VAN license agreement and plans to incorporate, under the new VAN license agreement, procedural changes that should improve the certification process. The revised VAN license agreement has been released for public comment. However, the potential for extensive public comments could slow the process for final issuance of the revised VAN license agreement.

Buying Organization Certification. The buying organization certification process that DISA established ensures that organizations are capable of transmitting data through the Infrastructure. To be considered interim FACNET certified, a contracting office should be able to:

o provide widespread public notice of solicitations for contract opportunities,

o receive responses to solicitations and associated requests for information, and

o allow private sector users to review and respond to solicitations.

In Inspector General, DoD, Project No. 6CA-0013, "Audit of DoD Interim Federal Acquisition Computer Network Certifications," we are evaluating whether adequate tests are performed before certification to ensure that buying organizations can actually process FACNET transactions. Preliminary results indicate that the DoD Electronic Commerce Office certified contracting offices that were not capable of sending and receiving FACNET transactions because the automated information systems to which the contracting offices are linked were successfully tested. For example, of 13 contracting offices reviewed, we identified 6 contracting offices that were interim FACNET certified but were not capable of performing the requirements for interim FACNET certification. Since testing was limited to automated information systems, reliability of FACNET was weakened and contracting offices and their trading partners may be impacted by potential loss of business.

Central Contractor Registry. The purpose of the central contractor registry is to establish a data base of all current and potential Government trading partners. The central contractor registry is to be a central repository to allow trading partners to register once with the Government instead of having to register with each buying organization. Use of the central contractor registry is not limited to FACNET. However, buying organizations, VANs, and trading partners expressed concerns about the ability of trading partners to become a part of the central contractor registry and about the capabilities of the central contractor registry. Their concerns were that:

o incompatible software and standards were used for processing central contractor registry information, and

o explicitly defined roles and responsibilities of the central contractor registry were lacking.

VANs stated that procedures that are used to include trading partners in the central contractor registry were not clear and that a lack of communication existed between the VANs and DISA about the central contractor registry. Also, no clear procedure identifies who is responsible for registering trading partners.

Trading partner registration is addressed in the current VAN license agreement and is being addressed in the proposed draft version of the VAN license agreement. However, the charges of the VAN to register trading partners may discourage smaller companies from registering. Also, VANs and trading partners complained that the process is too cumbersome. The Deputy Under Secretary of Defense (Acquisition Reform) is addressing problems with the central contractor registry and is considering managerial and policy changes. Because of delays in establishing the central contractor registry, the Central Contractor Registry Financial Work Group requested that the Inspector General, DoD, conduct a systems review and risk assessment of management controls over the sufficiency, integrity, and security of information contained in the central contractor registry. The issues include the use of existing data bases to populate the central contractor registry and the reluctance of vendors to provide proprietary data such as banking data in the central contractor registry.

Numbers Reported for FACNET Transactions. Army personnel expressed concerns about the accuracy of the number of FACNET transactions reported to the Deputy Under Secretary of Defense (Acquisition Reform). According to Army personnel, the number of FACNET transactions being reported include mainly functional acknowledgment transactions. Functional acknowledgments indicate the receipt and acceptance of other transactions such as requests for quotes. Because functional acknowledgments are only a confirmation of a FACNET transmission, the Army feels that functional acknowledgments should not be reported as actual FACNET transactions. The Deputy Under Secretary of Defense (Acquisition Reform) has been directly connected to the NEPs as of March 1, 1996, and as a result, should have valid data for purposes of tracking transaction volume broken down by Military Department and Defense agency.

Security Controls

DoD needs to consider the security of transactions and the protection of proprietary information transmitted through the Infrastructure in the future. At present, debate exists over the extent of security measures needed. However, to successfully accomplish EC/EDI in the future, Government agencies must ensure that full consideration is given to the risks inherent in the use of computers and telecommunications. Procurement transactions sent over the Infrastructure include sensitive information from trading partners that are exposed to the security risks inherent in transferring data through a network, including the security risks of the Internet. Without an appropriate level of security, EC/EDI operations may be unreliable, and loss of proprietary information may be unnecessarily high and subject to compromise. Security issues that need to be considered include development of a backup facility, use of electronic signature and encryption, and the existence of audit trails for management controls. As FACNET continues to grow and transaction values increase, the security issues identified will become even more important. While DISA is addressing many of the security issues, the following should be given particular attention.

Backup Facility. Limited consideration has been given within the Infrastructure to ensure that data backup and recovery are possible and to reduce the potential for loss of confidentiality and authentication. Our review of the Infrastructure showed that the system was not adequately designed to eliminate lost or delayed transactions if the NEPs or gateways experience interruption. As the number of transactions increase, the need becomes crucial to have alternate gateways and NEPs to prevent lost or delayed transactions. Additionally, NEPs and gateways would serve as backup systems when the primary system malfunctions.

Electronic Signature. A question has been raised on whether transactions sent over the Infrastructure are valid without signatures. The Comptroller General has ruled that digital signatures can be used instead of handwritten signatures. Digital signatures by involved parties serve as a means to authenticate the terms of the contract when transactions are paperless. Digital signatures are unforgeable, prove authenticity, and have the same legal status as a handwritten signature.

The need for digital signature capabilities was discussed with DISA management. DISA management did not believe that such capabilities were required for small purchases. In the past, many transactions were concluded verbally. However, United States Code, title 31, section 1501, indicates that a verbal agreement should be confirmed by a signed, written document, to record a valid obligation. Though the Comptroller General ruling makes digital signatures optional, we believe that digital signatures should be required to provide evidence of a binding agreement.

Encryption. Trading partners need assurance that information regarded as sensitive, such as quotes and proprietary data, are protected during FACNET transmission. Encryption capabilities within the Infrastructure would provide trading partners with assurance that unclassified but sensitive technical

information is protected. Encryption would convert bid information into a code readable only by authorized personnel. The American National Standards Institute standard X-12.58, a standard that defines data formats for EC/EDI transactions, provides that capability; however, guidance has not yet been approved for DISA implementation of the American National Standards Institute standard X-12.58 within FACNET.

In Inspector General, DoD, Project No. 5CA-3003, "Audit of Computer Security for Electronic Data Interchange and Electronic Commerce Program," we are evaluating procedures for data security, continuity of operations, transaction audit trails, personnel security, and compliance with network security requirements specifically for small purchases made through the EC/EDI program. Also, the Office of General Counsel, DoD, is reviewing legal issues regarding the use of digital signatures.

Vendor Participation

As of November 1995, approximately 1,500 out of a potential 200,000 DoD trading partners were registered in the central contractor registry. The small number of businesses willing to implement FACNET may be attributable to the cost and lack of training. To encourage vendor participation in FACNET, cost should be nominal and training should be available and effective.

Cost Investment. EC/EDI should use technology that is readily available within most businesses, which would not require a large investment in new capital resources. A survey of vendors indicates that they are reluctant to implement FACNET because they feel that an investment of $2,150 to $6,000 in hardware, software, American National Standards Institute X12 standards, and VAN services is often required. Vendors are unable to justify the expenditures involved with FACNET because the value of the requests for quotes going through the Infrastructure, at this point in time, is not high. In addition, trading partners must subscribe to a VAN that charges fees to transmit requests for quotes and bids between DoD and trading partners. Vendors feel that the VAN service fee structure is too complicated and expensive. According to the Deputy Under Secretary of Defense (Acquisition Reform), competitive alternatives to the VAN service fee will be available by September 1996.

Training. The Government funds electronic commerce training for 108 procurement technical assistance centers, 1,100 small business regional offices, and 11 electronic commerce regional centers (funded totally by DoD). The budget for the electronic commerce regional centers alone to provide free electronic commerce training is $76 million for 5 years. Electronic commerce training is also generally provided at cost by private firms and educational institutions. The value received by the Government and by DoD in particular is potentially less than the cost spent on training. Trading partners and DoD buying organizations feel that the training provided by Government sources does not address the needs of the audience and may be premature. Trading partners and DoD buying organizations also feel that training efforts will be of no value

until technical problems with FACNET and electronic commerce are resolved. Government electronic commerce training also shows potential duplication of effort.

In Inspector General, DoD, Project No. 6CA-0002, "Audit of Electronic Commerce Resource Centers," we are evaluating whether the program mission of the electronic commerce resource centers are providing effective and cost-efficient training and outreach to Government vendors.

Management Controls

Personnel responsible for resolving FACNET problems stated that guidance and procedures are lacking on maintaining an audit trail for FACNET transactions. As a result, resolving trouble ticket problems is extremely time-consuming. According to DISA personnel, the electronic commerce processing nodes, when operational, will have audit trail capabilities and will monitor incoming transactions using tracking logs.

At present, FACNET does not have adequate management controls to trace FACNET transactions. An adequate audit trail does not exist for transactions through the Infrastructure from DoD buying organizations to trading partners. For example, the NEP should have audit capabilities and tools for analysis of problems occurring with electronic transactions. In addition, the VAN license agreement requires an audit trail for transactions exchanged through the DoD mailbox for at least 90 days. The lack of audit trails throughout the Infrastructure may prevent DISA from identifying and correcting problems occurring with electronic transactions in a timely manner.

Further, management controls are necessary within any process to ensure compliance with procedures and to provide a trail to trace questioned transactions and system defects. A trail assists in the reviewing of records and the determination of accountability. In addition, a trail would assist personnel in resolving transaction problems. Building management controls and traceability into the Infrastructure is important to ensure that:

- the Infrastructure functions properly,
- problems can be traced and resolved, and
- personnel are held accountable for problems and corrective actions.

FACNET Implementation Plans

Planning is essential for the effective implementation of an EC/EDI system. Part of the planning should include analyzing existing systems and testing the system design to ensure that it can meet expected goals. Because of the urgency to implement FACNET, implementation plans were not fully developed before FACNET implementation in 1995. Now participants in FACNET have raised questions on whether restricting procurement opportunities to FACNET is

prudent and whether alternatives, including Internet and electronic bulletin boards, are more efficient and cost-effective. The Deputy Under Secretary of Defense (Acquisition Reform), DISA, Military Departments, and Defense agencies acknowledge the rapid growth in technology and are addressing the potential for and impact of alternatives to FACNET as originally designed.

Analyzing Existing Systems. Existing systems, such as the Internet and electronic bulletin boards, have certain capabilities that would improve or could supplement FACNET and make FACNET more effective. The Internet allows vendors to make bid decisions without delays. Internet capabilities include timely availability of procurement information and potentially less increased cost than FACNET because many vendors already pay for Internet services. Electronic bulletin boards are independently developed EC/EDI systems. A bulletin board consists of a computer equipped with a modem and communication software that enable procurement officials and vendors to exchange information through telephone lines. Procurement officials were using bulletin boards as an interim means to meet their procurement requirements until the Government-wide FACNET becomes fully operational.

The Director of the DoD Electronic Commerce Office acknowledges that the evolution of new technologies is creating alternatives to the original concept of FACNET as the single mechanism for EC/EDI procurements. The Director indicated that other alternatives were being analyzed that will still maintain the single face to industry. The alternatives are being evaluated in conjunction with a series of business decisions and evaluations of ways that DoD does business and procurement as a whole.

Testing of DoD FACNET Infrastructure. Some organizations were concerned about whether FACNET was capable of handling the expected work load once full implementation occurred. Currently, the Ogden, Utah, and Columbus, Ohio, NEPs process 15,000 to 20,000 transactions per day. According to DISA, the electronic commerce processing nodes will be capable of processing 1.5 million transactions per day. The electronic commerce processing nodes software will be more flexible and will also include financial and logistics capabilities. Concerns over the Infrastructure's capabilities might be valid because of the problems that exist with the transmission of data through the Infrastructure with a current work load that is substantially lower than the full implementation of FACNET. Adequate testing is not being done before implementation, as shown by the certification of buying organizations that are not capable of transmitting data through the Infrastructure and VANs not being tested for compliance with the VAN license agreement. We have identified four certified sites that are not ready to implement FACNET. Some assurance is needed to ensure that FACNET is being tested to meet expected goals for data transmission.

Conclusion

DISA and the DoD Electronic Commerce Office within the Deputy Under Secretary of Defense (Acquisition Reform) are actively addressing the issues identified and anticipate being able to successfully implement DoD FACNET capabilities by January 1, 2000. EC/EDI has already been a success for joint contracting centers in Bosnia and Hungary. A temporary contracting office in Hungary uses EC/EDI to locate and buy material from U.S. suppliers for fast shipment to troops working the peacekeeping mission in Bosnia.

The Inspector General, DoD, is currently conducting audits addressing the Infrastructure, security, and vendor participation. The audits will be addressing the validity of some of the concerns identified during this review. For the objectives of the audits, see Enclosure 2. Because of the ongoing efforts by the Deputy Under Secretary of Defense (Acquisition Reform) and DISA, and the ongoing audits, this report contains no recommendations for the issues identified.

Management Comments and Audit Response

We provided a draft of this report to you on March 26, 1996. Because this report contains no findings or recommendations, comments were not required, and none were received. Therefore, we are publishing this report in final form. We appreciate the courtesies extended to the audit staff. For additional information on this report, please contact Ms. Kimberley A. Caprio, Audit Program Director, at (703) 604-9248 (DSN 664-9248) (electronic mail KCaprio@DODIG.OSD.MIL) or Ms. Carolyn R. Milbourne, Audit Project Manager, at (703) 604-9214 (DSN 664-9214) (electronic mail CMilbourne@DODIG.OSD.MIL). Enclosure 5 list the distribution of this report. The audit team members are listed inside the back cover.

David K. Steensma

David K. Steensma
Deputy Assistant Inspector General
for Auditing

Enclosures

Glossary of Terms

Accredited Standards Committee (ASC) X12. ASC X12 develops the structure, format, and content of business transactions conducted through EDI.

American National Standards Institute. The American National Standards Institute was chartered in 1979 to develop uniform standards for electronic interchange of business transactions.

Electronic Commerce. Electronic commerce integrates electronic data interchange, electronic mail, electronic bulletin boards, and internal automated processing into a comprehensive system supporting all business functions.

Electronic Data Interchange. Electronic data interchange exchanges business data from computer to computer in a standardized format. Its prime function is to help businesses exchange data quickly and without error.

Federal Acquisition Network (FACNET). FACNET is the Government-wide EC/EDI systems architecture for acquisition. FACNET employs nationally and internationally recognized data formats and provides universal user access. The development of FACNET was a requirement of the Federal Acquisition Streamlining Act of 1994.

Gateway. A gateway is a system of both hardware and software that provides the ability to electronically exchange data between computer applications using ASC X12 standard EC/EDI transactions.

Network Entry Point (NEP). A NEP is a collection of hardware and software that provides connectivity to commercial VANs to transmit transactions between DoD and its trading partners and vice versa.

Single Face to Industry. Having a single face to industry is a major objective of implementing EC/EDI, through which external trading partners receive the electronic transactions in a similar and understandable manner regardless of the product or service to be provided.

Trading Partner. A trading partner is a customer, supplier, or service provider that conducts business with a DoD organization.

Value-Added Network (VAN). A VAN is a commercial communications network that provides a variety of services that allow trading partners to have one procurement environment.

Summary of Ongoing and Future Audits

The Inspector General, DoD, is currently performing six audits covering issues related to EC/EDI.

Inspector General, DoD, Project No. 6CA-0019, "Audit of Certification and Management of Value-Added Networks," began in October 1995. The audit objective is to determine whether the VAN certification process and the management and oversight of VANs are adequate.

Inspector General, DoD, Project No. 6CA-0013, "Audit of DoD Interim Federal Acquisition Computer Network Certifications," began in October 1995. The overall audit objective is to determine whether the process that DoD uses to issue interim FACNET certifications is adequate. The specific audit objectives are to determine whether the interim certifications are supported with required documentation and whether organizations that have received interim certification have the required software and are capable of performing the FACNET transactions.

Inspector General, DoD, Project No. 5CA-3003, "Audit of Computer Security for Electronic Data Interchange and Electronic Commerce Program," began in September 1995. The audit objective is to evaluate the procedures for data security, continuity of operations, transaction audit trails, personnel security, and compliance with network security requirements for the EC/EDI program.

Inspector General, DoD, Project No. 6CA-0005, "Audit of Vendor Participation in Electronic Commerce," began in October 1995. The audit objective is to identify the technical and business barriers to vendor use of FACNET and to facilitate vendors becoming FACNET compliant.

Inspector General, DoD, Project No. 6CA-0002, "Audit of Electronic Commerce Resource Centers," began in October 1995. The overall audit objective is to review the management of the electronic commerce resource centers. The specific objective is to determine whether the electronic commerce resource centers program mission provided effective and cost-efficient training and outreach to Government vendors on how to implement EC/EDI and related technologies.

Inspector General, DoD, Project No. 5CA-3002.01, "Audit of the Defense Information System Agency Management of Trouble Tickets," began October 1995. The overall objectives of the audit were to examine the effectiveness of the trouble ticket process and to identify problem areas that, if corrected, would result in fewer trouble tickets.

Summary of Prior Audits and Congressional Testimonies

The Office of the Inspector General, DoD, issued a report on electronic bulletin boards. The General Accounting Office presented testimonies to the House Committee on Small Business and the Senate Committee on Governmental Affairs and Armed Services concerning the audit objective.

Inspector General, DoD

Report Number 96-057, "DoD Use of Electronic Bulletin Boards in Contracting," January 8, 1996. The objective was to evaluate the use of bulletin boards by DoD organizations for contracting purposes. The audit determined that DoD procurement offices did not use bulletin boards to circumvent or impede FACNET implementation. By contrast, procurement officials were using bulletin boards as an interim means to meet their procurement requirements until the Government-wide FACNET was fully operational. The report contained no recommendations.

General Accounting Office

Procurement Reform. The General Accounting Office presented testimony on "Implementation of the Federal Acquisition Streamlining Act of 1994" to the House Committee on Small Business on July 20, 1995. The testimony focused on the progress made with the implementation of the Federal Acquisition Streamlining Act of 1994. The testimony identified several areas of FACNET that need to be addressed: establishment of a well-defined architecture, contractor registration with FACNET, procurement opportunities available through FACNET, and services and prices available through VANs.

Government Reform. The General Accounting Office presented testimony on "Using Reengineering and Technology to Improve Government Performance" to the Senate Committee on Governmental Affairs on February 2, 1995. The testimony focused on the following areas:

o the critical risk in how the Government is mismanaging its $25 billion annual investment in information technology;

o management practices used by leading organizations to reduce the risks of bad investments and increase the chances of successfully exploiting technology opportunities; and

o actions that executive agencies and Congress can take now to bring about a Government that is smaller, works better, and cost less.

Organizations Visited or Contacted

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition and Technology, Washington, DC
  Deputy Under Secretary of Defense (Acquisition Reform), Washington, DC

Department of the Army

Assistant Secretary of the Army (Research, Development, and Acquisition), Washington, DC
  Headquarters, U.S. Army Medical Command, Fort Sam Houston, TX
    Walter Reed Army Medical Center, Washington, DC
    Dwight David Eisenhower Army Medical Center, Fort Gordon, GA
Auditor General, Department of the Army, Washington, DC

Department of the Navy

Assistant Secretary of the Navy (Financial Management and Comptroller), Washington, DC
Naval Supply Command, Washington, DC
  Fleet and Industrial Supply Center, Norfolk, VA
  Fleet and Industrial Supply Center, Puget Sound, WA
  Fleet and Industrial Supply Center, San Diego, CA

Department of the Air Force

Assistant Secretary of the Air Force (Financial Management and Comptroller), Arlington, VA
  Deputy Assistant Secretary of the Air Force (Contracting), Arlington, VA
Air Combat Command, Langley Air Force Base, Hampton, VA
  6th Contracting Squadron, McDill Air Force Base, Tampa Bay, FL
Air Force Materiel Command, Wright-Patterson Air Force Base, Dayton, OH
  Air Force Development Test Center, Eglin Air Force Base, Pensacola, FL
  Maxwell Air Force Base-Gunter Annex, Montgomery, AL
Air Mobility Command, Scott Air Force Base, IL
  437th Military Airlift Command, Charleston Air Force Base, Charleston, SC

Defense Organizations

Defense Information Systems Agency, Arlington, VA
  Defense Information Technology Contracting Office, Scott Air Force Base, IL
  Defense Information Systems Agency Western Hemisphere, Fort Ritchie, MD
    Defense Megacenter Columbus, OH

Defense Organizations (cont'd)

Defense Megacenter Mechanicsburg, PA
Defense Megacenter Ogden, UT
Defense Logistics Agency, Alexandria, VA
Defense General Supply Center, Richmond, VA

Non-Defense Federal Organization

General Accounting Office, Washington, DC

Non-Government Organizations

Advanced Communication Systems, North Olmsted, OH
American Logistics Information Corporation, Diamond Bar, CA
Advance Logic Resources, Yaphank, NY
AT&T, Philadelphia, PA
Datamatix, Plymouth Meeting, PA
Electronic Data Systems, Herndon, VA
ELOCO, New Castle, NH
GAP Instrument Corporation, Long Island, NY
General Electric Information Systems, Rockville, MD
Harbinger EDI Services, Atlanta, GA
MCI Telecommunications Corporation, Piscataway, NJ
Network Information Services, Newport Beach, CA
Sidereal Corporation, Springfield, VA
Simplix, Troy, MI
Softshare Information Services, Santa Barbara, CA
Sprint Government Systems Division, Overland Park, KS
Sterling Software, Dublin, OH
Technology Management Programs, Carlsbad, CA
Total Procurement Services, Novato, CA
TranSettlements, Inc., Atlanta, GA
VAN SAT, Oklahoma City, OK

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Senate Committee on Armed Services
Senate Committee on Governmental Affairs
House Committee on Appropriations
House Subcommittee on National Security, Committee on Appropriations
House Committee on Government Reform and Oversight
House Subcommittee on National Security, International Affairs, and Criminal Justice, Committee on Government Reform and Oversight
House Committee on National Security

Audit Team Members

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