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Secretary of State

State of Oregon

**DEPARTMENT OF HUMAN SERVICES**

**Food Stamp Management Information System**

**Application Control Review**



**Audits Division**

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*Auditing for a Better Oregon*

The Honorable John Kitzhaber, M.D.  
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This report includes our evaluation of the Department of Human Services' (department) application controls over the Food Stamp Management Information System (FSMIS). The department relies on FSMIS to distribute approximately \$16 million to food stamp recipients each month. During our audit, we reviewed policies and procedures relating to ensuring appropriate data input, processing and output; managing system and programming changes; and providing system security.

The report includes recommendations to improve management of FSMIS. Priority items needing attention include improving application controls affecting input edits, client case holds, transaction balancing, error correction, and eligibility and income determination; enforcing and improving controls over programming changes; and improving controls over system and data security.

The Department of Human Services generally agrees with our recommendations.

OREGON AUDITS DIVISION

John N. Lattimer  
Director

Fieldwork Completion Date:  
April 16, 2001



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## **SUMMARY**

### **BACKGROUND**

The Oregon Department of Human Services (department) is the state agency responsible for providing federal food stamp benefits to Oregon clients. According to the department, it distributes approximately \$16 million to food stamp recipients each month.

The department relies on the Food Stamp Management Information System (FSMIS) to manage the Food Stamp Program. FSMIS is a complex computer system that interfaces with several other computer systems and databases. The department implemented FSMIS in the late 1970s. The department's Office of Information Services operates and maintains the system.

### **SCOPE AND PURPOSE**

The purpose of this audit was to evaluate application controls governing FSMIS. Application controls ensure that data remains complete, accurate, and valid during input, processing, and output. Additionally, we evaluated the department's system development and maintenance procedures as well as safeguards to protect FSMIS programs and data.

### **AUDIT RESULTS**

Although FSMIS includes various application controls, some do not function as intended. The department can improve its input edits, client case holds, transaction balancing, error correction, eligibility verification and income determination.

The department has a System Development Life Cycle (SDLC) methodology to control system development and maintenance activities; however, the managers did not ensure that the staff followed the prescribed methodology. Additionally, the department's SDLC does not adequately address some important issues. Areas needing improvement include program change management, software version control, documentation, testing, quality assurance and consideration of security matters.

Department management has not adequately restricted access to FSMIS systems or data. Additionally, they have not resolved federal findings regarding limiting FSMIS access to facilitate proper separation of duties for those issuing food stamp benefits.

## **RECOMMENDATIONS**

Our recommendations address the following general areas:

- Improve application controls affecting input edits, client case holds, transaction balancing, error correction, eligibility verification and income determination.
- Ensure that department staff follow prescribed SDLC methodologies including those governing program change management, software version control, documentation, testing and quality assurance.
- Modify the existing SDLC methodology to ensure adequate consideration of security issues as systems are developed or changed.
- Develop and implement procedures to ensure that logical access to FSMIS programs and data are appropriately restricted. This access must allow for appropriate separation of duties.

## **AGENCY'S RESPONSE**

The Department of Human Services generally agrees with our recommendations.

## **INTRODUCTION**

The United States Department of Agriculture administers the Food Stamp Program in cooperation with state and local governments. For Oregon, the Department of Human Services (department) is the state agency responsible for providing food stamp benefits to Oregon clients. The federal government funds 100 percent of food stamp benefits and 50 percent of the costs of administering the program. According to the department, approximately 197,000 Oregonians receive food stamp benefits each month. These expenditures total approximately \$16 million per month.

The vast majority of food stamp clients access their benefits electronically using an Oregon Trail Card. The Oregon Trail Card functions like a bank debit card, allowing clients to purchase food at authorized retail locations or, under certain circumstances, draw cash through bank automated teller machines.

The department relies on the Food Stamp Management Information System (FSMIS) and its subsystems to administer the Food Stamp Program. FSMIS is a complex computer application that interfaces with several other computer systems and databases. The department implemented the FSMIS during the late 1970s. The department's Office of Information Services operates and maintains the system. Since its implementation, FSMIS has been frequently modified to accommodate changes in the Food Stamp Program.

## **INFORMATION SYSTEM CONTROLS**

Information system controls are generally categorized as general or application controls. General controls are those controls that protect the environment in which all application software operates. On the other hand, application controls are designed to reduce the risk of unauthorized, inaccurate, or incomplete input, processing, output, and storage of transactions for a specific application.

## **SCOPE AND METHODOLOGY**

This audit was an application controls review of the Food Stamp Management Information System (FSMIS). The audit had the following objectives:

- Determine whether the department manages FSMIS data to ensure that it remains complete, accurate and valid during data input, processing and storage.

- Determine whether the department controls changes to FSMIS during system development and maintenance procedures.
- Determine whether the department safeguards FSMIS information and programs against unauthorized use, disclosure or modification, damage or loss.

We performed our fieldwork at various intervals between January 2000 and April 2001. To achieve our audit objectives, we interviewed agency staff, examined documents supporting controls, and observed the department's processes and operations. We evaluated compliance with applicable laws, rules and regulations pertaining to our audit objectives. We also designed and performed tests to determine if selected controls existed or were working as intended.

During our audit we used the Information Systems Audit and Control Foundation's (ISACF) Control Objectives for Information and Related Technology (COBIT<sup>TM</sup>) to identify generally accepted and applicable control objectives and practices for information systems. ISACF is a worldwide organization dedicated to researching and promulgating generally accepted information systems control objectives and audit guidelines.

We conducted our audit in accordance with generally accepted government auditing standards.

## CHAPTER I: APPLICATION CONTROLS

The Department of Human Services (department) is responsible for ensuring that food stamp benefits are paid according to federal guidelines and rules. The department relies on the Food Stamp Management Information System (FSMIS) to facilitate those business objectives. The FSMIS requires complete, accurate and valid data to correctly perform this business function.

The department is responsible for developing application controls to ensure that valid data are entered into the system, processing functions produce accurate results, and data are properly distributed and stored. Application controls generally are a combination of manual or automated processes and procedures designed to prevent, detect and correct erroneous data.

### APPLICATION CONTROL ISSUES

Although FSMIS relies on various application controls, we found that some do not work as intended or were not appropriately designed. Areas where controls could be improved include the following:

- Input editing routines.
- Client case holds.
- Transaction balancing.
- Error correction.
- Eligibility verification.
- Income determination.

#### **Input Editing Routines**

FSMIS uses programmed input edits to limit the benefit amounts that caseworkers may manually enter. However, those limits are substantially above the federal limits. For example, in one test the system accepted up to \$1,000 for a client who was eligible for a maximum benefit of \$234. Due to this weakness, the likelihood is greater that caseworkers could authorize benefit amounts in excess of client entitlements.

#### **Client Case Holds**

Under certain circumstances, department employees may need to place food stamp cases on hold so that benefits will not be available to the client until all conditions of eligibility have

been satisfied. Sometimes, however, these holds do not actually prevent food stamp benefits from being processed and paid. This potentially allows clients to receive food stamp benefits in error.

### **Transaction Balancing**

FSMIS program output should be routinely balanced to control totals to ensure that all transactions are accounted for and that no unauthorized transactions have been added. Audit trails should be provided to facilitate the tracking of transactions and the reconciliation of data. Balancing processes increase data reliability by providing evidence that what was input into the system agrees to the outputs.

Although the department balances some FSMIS output, it does not ensure that all transactions are completely and accurately accounted for in all databases. As a result, some FSMIS databases are unreliable because they contain erroneous information. For example, the Food Stamp Master File contains duplicate and miscoded records, and the Food Stamp Reconciliation File is not a complete or accurate record of authorized food stamp transactions. Because of problems with these files, the department designated a database in another system as the official record of food stamp issuance. However, that file does not include all of the information associated with the transactions. Thus, department employees must use the less reliable FSMIS datafiles to supplement the official record.

### **Error Correction**

The department should have procedures to identify, correct and timely resubmit erroneous transactions. Corrections should be independently reviewed to ensure their appropriateness and accuracy. Although the department has procedures for identifying certain transactions that have not processed correctly, it does not have written procedures for correcting and resubmitting those transactions. We noted the following weakness in the department's informal processes for correcting data:

- Staff members making corrections do not always document the actions they took to correct errors. Additionally, the department does not always retain documentation to identify the transactions that did not process correctly.
- Resubmissions are not independently reviewed for appropriateness and accuracy.

These conditions increase the likelihood that errors will not be appropriately corrected. Additionally, unauthorized or inappropriate transactions may be entered and go undetected.

**Eligibility Verification**

FSMIS accesses a federal database to determine whether clients are ineligible for food stamp benefits due to intentional program violations. We compared the federal database to FSMIS benefit payment files for six months. For this period, we identified 22 instances in which disqualified individuals received food stamp benefits. Those payments totaled approximately \$2,200.

**Income Determination**

According to federal regulations, certain welfare benefits must be added to client income before calculating food stamp benefits. During processing, FSMIS interfaces with the department's Client Maintenance System to determine whether clients have received other welfare benefits that would limit their food stamp entitlement. However, FSMIS allows caseworkers to code food stamp cases so that they will bypass this automated routine. When the bypass has been invoked, caseworkers are responsible for manually entering the information. If they do not enter the appropriate amount prior to processing, the client's benefit will be inaccurately calculated. For the period including November 1999 through April 2000, we selected a random sample of 60 cases that were coded to bypass the automated income determination subroutine. Of those, 12 were erroneously calculated, resulting in either underpayments or overpayments.

**CONCLUSIONS  
REGARDING DATA  
QUALITY**

As a result of these deficiencies, critical data stored in FSMIS datafiles is not accurate or complete. Relying on incomplete or inaccurate data increases the likelihood for errors in administering food stamp benefits. During the federal fiscal years 1996 through 1999, Oregon's combined error rate for food stamp issuances was above the national average. Federal auditors estimated that Oregon overpaid food stamp clients approximately \$15 million and underpaid others approximately \$4 million during the federal fiscal year 1999. The federal government may impose sanctions for states having error rates above the national average. Those sanctions may include reduced program funding.

Ultimately, the data quality issues occur because the department has not developed or maintained FSMIS using a comprehensive System Development Life Cycle methodology.

## **RECOMMENDATIONS**

**We recommend** that the Department of Human Services create an action plan to improve the accuracy and reliability of FSMIS datafiles. Specifically, the department should consider the following:

- Adjust system edits to ensure that manually entered authorizations cannot exceed the maximum benefits allowed.
- Increase the effectiveness of client case holds to ensure that benefits will not be paid until the hold is released.
- Implement transaction balancing and tracking routines to ensure that all transactions are completely and accurately accounted for in all databases.
- Develop written procedures for error correction and resubmission. Procedures should require staff to adequately document the actions taken to resolve the errors and require independent review and approval of corrections.
- Improve eligibility verification routines to ensure that ineligible clients in the federal Intentional Program Violation database are excluded from receiving benefits.
- Develop effective controls to ensure that client case records coded to bypass the income determination subroutine include all required income data prior to benefit calculation.

## CHAPTER II: SYSTEM DEVELOPMENT AND MAINTENANCE

The generally recognized standard for developing and maintaining computer-based systems is a comprehensive System Development Life Cycle (SDLC) methodology. An effective SDLC methodology provides policies and techniques to ensure that all phases of system development and maintenance are adequately addressed. It should include a series of steps or phases that have defined goals and target completion dates. System maintenance efforts may not require the same level of detail or phases as new applications; however, the procedures should ensure that many of the same development processes are followed on a scale appropriate for the magnitude of the effort. Following a structured SDLC methodology reduces the likelihood that disruptions, unauthorized alterations, or errors can be introduced into the system.

Department management is ultimately responsible for defining and implementing effective information system standards, including an SDLC methodology, to govern maintenance of FSMIS.

### SDLC ISSUES

The department has a written SDLC methodology, but the Office of Information Services (OIS) generally did not follow it. Furthermore, the methodology does not adequately address some important SDLC issues. Areas needing improvement include the following:

- Program change management.
- Software version control.
- System documentation.
- Procedures for testing system changes.
- Quality assurance procedures.
- Security measures.

#### **Program Change Management**

System changes should be controlled using formal procedures to initiate, categorize, prioritize and authorize maintenance projects. These procedures should provide for the analysis, implementation and follow up of all changes requested and made to the existing system. Specific procedures should be in place to guide programmers while performing emergency changes to allow the system to continue processing.

OIS has not developed a standard process to ensure that all change requests are prioritized. Additionally, it has not established procedures to ensure that emergency changes are performed without compromising the integrity of the system. As a result, there is an increased risk that unauthorized alterations and errors may be intentionally or unintentionally introduced into the system.

### **Software Version Control**

OIS relies on program libraries to track system changes and to ensure that only authorized code is put into production. However, the department's libraries are not consistently and accurately maintained to ensure proper version control.

Of the 45 programming changes that OIS moved into production during April and May 2000, only four had sufficient documentation. Of those four, none were appropriately authorized or reviewed. The information in the system libraries has not been accurately updated; thus, they are not reliable. Furthermore, during the audit OIS provided us various FSMIS datafiles that did not match the associated file descriptions. As a result, the likelihood is greater that unauthorized code or errors could be introduced into FSMIS files or programming. Additionally, there is increased risk that data cannot be retrieved accurately or in a timely manner.

### **System Documentation**

SDLC methodologies should include provisions for creating and updating system documentation, such as system requirements, program specifications, and operations manuals. In addition, organizations should create and retain documentation of significant SDLC processes and approvals as they occur, such as software testing plans and results of those tests. Documentation should be sufficient to guide and direct employees as they use or modify the system.

Although the department's SDLC methodology requires programmers to create and retain documentation of system development and maintenance activities, OIS management generally did not ensure that programmers followed the prescribed policies and procedures. As a result, FSMIS documentation is incomplete, fragmented, and generally out-of-date. For example, key technical references such as file specifications, detailed designs, lists of affected components, and user manuals were not updated to reflect all system modifications. As a result, the risk is higher that users, operators and programmers may introduce errors into the data

or programs because they do not fully understand key system requirements or attributes.

### **Procedures for Testing System Changes**

The department should ensure that all software changes are tested according to fully developed testing plans and the results of tests reviewed and approved prior to moving new code into the production environment.

OIS has not developed formal plans to test FSMIS program changes, nor has it retained the results of its tests. Additionally, the OIS manager in charge of FSMIS development and maintenance has not adequately validated all programming changes by reviewing software test results. This increases the likelihood that unauthorized changes or errors may be introduced into the system.

### **Quality Assurance Procedures**

An OIS manager assigned to FSMIS is responsible for performing quality assurance reviews and ensuring that staff adheres to the standards and guidelines included in the department's SDLC methodology. In addition, he is responsible for providing overall supervision of all those performing FSMIS programming changes.

The manager did not review and approve programming changes; rather, he assigned those tasks to the programmer who performed the work. In addition, he did not perform code comparisons to ensure that only authorized changes were made to the system. Furthermore, he did not ensure that important SDLC standards such as system documentation and testing were performed as required. As a result, the risk is greater that unauthorized changes or errors may be introduced into the system.

### **Security Measures**

Security impacts should be evaluated for every change or modification that is made to the system. The department's SDLC methodology should provide for this evaluation as early as possible in the process to ensure data and programs are safeguarded from unauthorized use, modification, or disclosure.

The department's SDLC methodology does not adequately address security to ensure appropriate measures are incorporated into the system. As a result, the department has not adequately safeguarded FSMIS information and programs

against unauthorized use, disclosure or modification, damage or loss.

## **CONCLUSIONS REGARDING SDLC ISSUES**

Modifying and maintaining FSMIS without the benefit of a well-developed and enforced SDLC methodology increases the department's business risk. Therefore, the likelihood is greater that FSMIS will not meet the organization's business requirements. These requirement include ensuring that food stamp benefits are issued to eligible clients in correct amounts and on a timely basis. As a result of the above SDLC processes, FSMIS will be more expensive to maintain, operate, or modify to meet future needs.

## **RECOMMENDATIONS**

**We recommend** that Department of Human Services management improve and enforce its SDLC methodology by addressing the following items:

- Develop and implement standard processes to ensure that all system requests are prioritized.
- Develop and implement procedures to ensure that emergency changes are performed without compromising FSMIS integrity.
- Ensure that program libraries are accurately and consistently maintained to allow for more effective version control.
- Ensure that programmers create and retain documentation of system development and maintenance activities. Additionally, critical documentation that is currently missing, such as file and technical descriptions, should be created.
- Provide managerial oversight to ensure that staff develops formal plans to test FSMIS program changes and subsequently retains the results of those tests. Additionally, department managers should validate all programming changes by reviewing testing plans and results.
- Ensure that quality assurance activities occur. These activities should include reviews and approvals of

programming changes and code comparisons to ensure that only authorized and approved changes are made to the system.

- Ensure that all SDLC standards are performed as required to ensure that appropriate security measures are considered as part of each system modification.



## CHAPTER III: SECURITY

Department of Human Services (department) management is responsible for safeguarding FSMIS data and systems from unauthorized use, disclosure or modification, damage or loss. These safeguards should include logical access controls to limit access based on an individual's demonstrated need to view, add, change, or delete programs or data. Because FSMIS data includes highly confidential information, the federal government has imposed strict requirements regarding its disclosure.

Management also is responsible for maintaining an appropriate operating environment for its computer systems. This includes assigning roles and responsibilities to ensure separation of important functions. Separation of duties is important to minimize the likelihood of errors or illegal acts occurring, and to ensure that if such events do occur, they will be detected and corrected in a timely manner.

### LOGICAL ACCESS CONTROLS

In automated systems such as FSMIS, separation of duties is facilitated by appropriate logical access controls. The United States Department of Agriculture's Office of Inspector General reviewed Oregon's food stamp program in 1999. One of the significant findings in that report was that the department did not sufficiently limit logical access to FSMIS to provide for appropriate separation of duties for those authorizing and issuing food stamp benefits.

As of April 2001, department management has not resolved the federal findings regarding proper separation of duties for those issuing food stamp benefits by further limiting logical access to FSMIS. Additionally, department management has not appropriately limited the logical access of its programmers and staff maintaining the FSMIS. Furthermore, certain FSMIS data do not have appropriate controls to allow for adequate monitoring of access.

### RECOMMENDATION

**We recommend** that department management develop and implement procedures to ensure that access to FSMIS data and programs are appropriately restricted. Access should be granted according to users' demonstrated need and must allow for appropriate separation of duties.

## **COMMENDATION**

The courtesies and cooperation extended by the officials and staff of the Department of Human Services during the course of this review were commendable and sincerely appreciated.

## **AUDIT TEAM**

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**AGENCY'S RESPONSE TO THE AUDIT REPORT**





# Oregon

John A. Kitzhaber, M.D., Governor

## Department of Human Services

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May 21, 2001

TO: Secretary of State Audits Division

FROM: Bobby S. Mink, Director

RE: Food Stamp Audit Response

This memorandum is in response to the Secretary of State's audit of the State of Oregon, Department of Human Services, Food Stamp Management Information System (FSMIS) Application Control Review.

As you stated in your audit FSMIS consists of 346,000 lines of code, 243 programs, and was written in the 1970's.

Over the years, the Department has placed the first priority in allocating its resources to enhance and/or expand client-based programs rather than invest in significant improvements in its infrastructure. The FSMIS is a good example of this.

We do, however, appreciate the issues you've brought to our attention and recognize that improving the accuracy and reliability of FSMIS will result from a combination of management actions relating to business practices and technological changes.

We will work with the Department of Administrative Services to develop an action plan by September 30, 2001 that addresses corrective actions in application control, system development and maintenance, and security of FSMIS.

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