A Report
to the
Montana
Legislature

Information Systems Audit

Automated Licensing System: Review of Select Processing Controls

Department of Fish, Wildlife and Parks

November 2009

Legislative Audit
Division

09DP-09

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Members of the IS audit staff hold degrees in disciplines appropriate to the audit process. Areas of expertise include business, accounting, education, computer science, mathematics, political science, and public administration.

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November 2009

The Legislative Audit Committee
of the Montana State Legislature:

We conducted an Information Systems audit of controls within the Automated Licensing System (ALS) at the Department of Fish, Wildlife and Parks (FWP). The focus of the audit was to: ensure specific ALS processing controls function as FWP management intends, ensure FWP controls changes to ALS, determine the implementation status of prior audit recommendations (05DP-03), and determine why FWP does not have an up-to-date Disaster Recovery/Business Continuity plan.

This report contains four recommendations for strengthening processing and change controls, and maintaining an up-to-date disaster recovery plan.

We wish to express our appreciation to the Montana Department of Fish, Wildlife and Parks for their cooperation and assistance.

Respectfully submitted,

/s/ Tori Hunthausen

Tori Hunthausen, CPA
Legislative Auditor

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Report Summary

Department of Fish, and Wildlife and Parks

The Automated Licensing System (ALS) facilitates the Department of Fish, Wildlife and Parks (FWP) hunting, fishing, and recreational license issuance process. ALS also aides FWP in conducting license drawings, supports administrative business functions related to licensing, and provides data which assists with the enforcement of hunting and fishing regulations. In fiscal year 2004, approximately $37 million in license fee revenue was processed through ALS. This has increased through fiscal year 2009 as license fee revenues processed through ALS reached just under $45.6 million.

Considering hunting and fishing are important cultural aspects of life in Montana and license fees are an important source of operational revenues for FWP, it is essential ALS accurately process license revenue information (fees) and maintain the integrity of licensee information. Due to the reliance FWP places on ALS, we conducted audit work to address objectives related to processing controls, system change controls, and system availability.

Information system processing controls ensure complete and accurate processing of data from input to output. Audit work was conducted to ensure specific ALS processing controls function as FWP management intends. Additionally, information systems are generally a dynamic and fluidly changing environment. Data can be modified and programming code updated to reflect the changing needs of an organization or to remediate flaws. We reviewed procedures in place to ensure FWP controls changes to ALS. Finally, agencies are responsible for maintaining information systems availability in the event of a disaster or major outage. To mitigate the damage resulting from disruptions, agencies need to implement a disaster recovery plan. Our audit reviewed why FWP does not maintain an up-to-date disaster recovery plan for ALS.

Overall, we conclude ALS processing controls are functioning as management intends. However, we identified areas where FWP can improve controls around ALS including more effectively identifying deceased licensees, preventing and detecting unauthorized changes to programming code and database tables, and better preparing for the continuity of licensing operations. This report discusses our findings and includes four recommendations for strengthening processing and change controls and maintaining an up-to-date disaster recovery plan.

Chapter I – Introduction and Background

Introduction

The Automated Licensing System (ALS) facilitates the Department of Fish, Wildlife and Parks (FWP) hunting, fishing, and recreational license issuance process. ALS also aides FWP in conducting license drawings, supports administrative business functions related to licensing, and provides data which assists with the enforcement of hunting and fishing regulations.

ALS users include:

- FWP employees and contractors who develop and administer ALS
- internal FWP employees who issue licenses at FWP headquarters and regional offices
- external license retailers who issue licenses from business locations
- members of the public who access ALS from the Internet through the eLicense Sales application

ALS is a custom system developed by a third party vendor and FWP development staff. System implementation began in 2002 and was completed during 2004. ALS issues licenses and permits using point-of-sale (POS) terminals at license provider locations and FWP district offices, and through the Internet using the eLicense Sales application. Transaction information from both POS terminals and eLicense Sales is sent to ALS servers housed and maintained by the Department of Administration Information Technology Services Division (ITSD). Current efforts consist of enhancements to functionality and ongoing system maintenance performed by in-house staff.

License fee revenues are an important source of funding for FWP operations. In fiscal year 2004, approximately $37 million in license fee revenue was processed through ALS. This has increased through fiscal year 2009 as license fee revenues processed through ALS reached just under $45.6 million.

Audit Objectives

Considering hunting and fishing are important cultural aspects of life in Montana and license fees are an important source of operational revenues for FWP, it is essential ALS accurately process license revenue information (fees) and maintain the integrity of licensee information. Due to the reliance FWP places on ALS, we conducted audit work to address the following objectives:

- Ensure specific ALS processing controls function as FWP management intends.

- Ensure FWP controls changes to ALS.
- Determine the implementation status of prior audit recommendations. (05DP-03)
- Determine why FWP does not have a fully developed and tested Disaster Recovery/Business Continuity plan.

Audit Scope and Methodology

ALS provides diverse functionality for FWP leading to a relatively complex system. Adding to the complexity are fee and licensing changes brought about during legislative sessions and rule changes issued by the Fish, Wildlife and Parks Commission. In 2003 and 2005, we conducted Information Systems audits of ALS. As a result, our audit addressed areas we had not previously reviewed, follow-up on prior areas of review and resulting recommendations, concerns identified during preliminary work.

Testing ALS functionality and controls included a combination of interview of management and staff, review of agency documents, observation of ALS processes, and extraction and analysis of ALS data using a computer assisted audit tool.

This audit was conducted in accordance with Government Auditing Standards published by the United States Government Accountability Office. We evaluated the control environment using state law and generally applicable and accepted government information technology standards established by the National Institute of Standards and Technology.

Prior Audit Recommendations

In the previous ALS audit report (05DP-03), we made two recommendations to FWP. Our recommendations addressed granting and monitoring access to ALS, and documenting procedures and training backup personnel for critical processes.

We recommended the department develop and maintain written procedures for granting user access to ALS, and periodically review user access for appropriateness. The department has developed a written policy and formal procedures for granting user access to ALS. Individuals requesting access must complete an access request form which must be signed by their supervisor and approved by management. FWP hired an Information Technology Security Officer in November 2008 and the department is currently undergoing a process to review all user access across all FWP applications. The Information Technology Security Officer indicated once the review was completed, further reviews would be conducted on an annual basis. As a result, this recommendation is being implemented.

We also recommended the department document procedures performed during the ALS license revenue collection process, and train backup personnel to perform duties in case of absence. The department has implemented this recommendation.

Audit Overview

Based on our work, we conclude ALS processing controls are functioning as management intends. However, we identified areas where FWP can improve controls around ALS including more effectively identifying deceased licensees, preventing and detecting unauthorized changes to programming code and database tables, and better preparing for the continuity of licensing operations by maintaining an up-to-date disaster recovery plan. The remainder of this report discusses our findings and recommendations.

Chapter II – Processing Controls

Introduction

Information system processing controls ensure complete and accurate processing of data from input to output. Examples include accuracy of data exchanged with other information systems, program scripts to ensure correct data format, and identifying individuals with suspended privileges. During our review, we identified several processing controls in the Automated Licensing System (ALS) important to Department of Fish, Wildlife and Parks (FWP) business processes for issuing hunting and fishing licenses and enforcing hunting and fishing laws. As a result, we conducted audit work to ensure specific ALS processing controls function as FWP management intends.

Processing Controls

During the planning stages of our audit, we identified five specific processing controls in ALS we had not previously audited or have been of particular interest to the public. The processing controls we reviewed were:

- Seven Year Wait Licenses: A person who receives a moose, mountain goat, or limited mountain sheep license, with the exception of an antlerless moose or an adult ewe game management license, is not eligible to receive another special license for that species for the next seven years.
- Social Security Numbers: For the purposes of enforcing the collection of child support, Title IV-D of the Social Security Act requires states to collect the Social Security Number (SSN) of all persons applying for a recreational license. The 2007 Legislature enacted restrictions on the collection of SSN's.
- Bonus Points: FWP uses a drawing process to award game licenses in limited license areas. An applicant who is unsuccessful in obtaining a license in their first preferred district earns a bonus point which can be used in later drawings.
- Suspension of License Privileges: Individuals convicted of hunting or fishing violations can have their privilege to hunt or fish suspended for a period of time. FWP relies on suspension information provided by the Notice to Appear and Complaint (NTA) and Interstate Wildlife Violator Compact (IWVC) applications to prevent suspended individuals from obtaining licenses.
- Deceased Licensees: Deceased individuals are identified within ALS by the individual's record being manually "flagged". Once the flag is set, ALS prevents the sale of any FWP issued licenses using the individual ALS record.

The following sections provide details of our findings.

Seven Year Wait Licenses

FWP relies on a table within ALS to monitor individuals who have received these license types and prevent the issuance of the same license for the required seven years. When a licensee receives a seven year wait license, the name of the licensee, their ALS number, the license type code, and the year the license was awarded are placed into the table. Should the licensee apply to purchase the same license type within the next seven years, a system edit would flag the exclusion and FWP could prevent the individual from entering the drawing.

Audit work was conducted to determine if controls in ALS ensure the seven year wait period for specific licenses functions as required. We queried ALS to determine if any licensees had been able to purchase any of the license types requiring a seven year wait more than once in seven years. Our query did not identify any individuals purchasing two of the same seven year wait licenses within seven years.

Social Security Numbers

Prior to 2007, FWP requested the complete SSN of all individuals purchasing hunting or fishing licenses. During the 2007 Legislative Session, House Bill 450 was passed restricting FWP's collection and storage of SSN's to the last four digits. Audit work was performed to verify only the last four digits of licensee social security numbers are requested and maintained by ALS.

After the passage of House Bill 450, FWP developed two new programming scripts: the first cut the existing SSN's in ALS from nine digits down to four, and the second limited the number of digits accepted by ALS to four. We verified there are no SSN's in ALS longer than four digits and observed the entry of new SSN's to verify the system will not accept more than four digits.

Bonus Points

The idea behind the bonus point system is to provide all applicants at least one opportunity at drawing a license, while still giving those individuals who have been unsuccessful in the past a chance to increase their odds of drawing a license in the future. Each time an individual applies for a drawing, if they have bonus points available, they can pay a fee and apply their accumulated points to a drawing.

Audit work was conducted to verify bonus points awarded to license applicants do not affect the randomness of license drawings. Essentially, bonus points act as an additional

"ticket" in the drawings, but they have no effect on the randomness of the numbers drawn. The process is similar to a lottery where the number of tickets an individual possesses has no bearing on the winning number drawn. During 2005, we tested the randomness of the license drawing process and determined the winner of drawings was random and the process has not changed since that time.

Suspension of License Privileges

Suspensions can be limited to certain species or can run the entire spectrum of licenses for hunting, fishing, or both. The NTA and IWVC applications contain information on individuals convicted of violating hunting and fishing laws both in Montana and other member states of the IWVC. Audit work was conducted to ensure the NTA and IWVC interfaces provide accurate suspension information to ALS. Through interviews with FWP enforcement staff and observation of each interface, we were able to confirm suspension information is transferred to ALS. The data is maintained in the same table as the seven year wait information and license issuance is limited as previously described. In the case of suspensions, the individuals remain in the table until the suspension period ends.

Deceased Licensees

Since deceased persons do not qualify for licensure, ALS must track deceased individuals to prevent license sales to any individual attempting to use a deceased individual's ALS record. To determine the effectiveness of ALS deceased individual tracking, we developed a query to identify resident licensees who purchased hunting or fishing licenses for 2007 and 2008. Using a computer assisted audit tool, we compared the licensees against a list, provided by Montana's Office of Vital Statistics, of individuals who died from 2004 through 2008. We identified 188 resident licensees in ALS who were shown as deceased on the list. None of these licenses were purchased after the date of death. Given we only reviewed ALS records for 2007 and 2008, there could be additional individuals who are deceased but remain eligible in ALS.

In order to set the ALS deceased licensee flag, FWP relies on external processes; either relatives or friends of the deceased must contact the agency and inform them of the death of the licensee, or FWP staff calling for an annual survey must identify the deceased. These processes are not effective in identifying and flagging all deceased licensees in ALS as evidenced by the results of our query. Accounts for deceased licensees who remain eligible in ALS could be used to purchase licenses. Agency management indicated no process to check for deceased licensees was ever included during the business requirement definition stages for ALS, and no automated process to identify deceased licensees has been developed since the inception of ALS.

Duplicate Records

When a retailer searches ALS to determine if an individual already has an account, and the account is flagged as deceased, they receive the same message they would receive if the individual does not exist in ALS. The normal process would then be to establish a new ALS account. ALS does not automatically perform a real-time duplicate records check at the time this new account is created. Additionally, it does not lock the first name, last name, and date of birth combination, preventing the use of the same name and date of birth for a new record. A duplicate check is only performed once per year using a manual process. These factors could allow an individual to make use of the personal information of a deceased individual to create a duplicate ALS account.

While we did not identify any purchases after the date of death using deceased licensees ALS accounts, the possibility exists. Montana law allows a resident to apply for and purchase a wildlife conservation license, hunting license, or fishing license for the resident's spouse, parent, child, brother, or sister who is otherwise qualified to obtain the license. Should an individual possess the required identification of a deceased relative, and the relative was not flagged as deceased, there would be nothing to prevent the individual from purchasing a license using the deceased's ALS account. Additionally, individuals committing identity theft could purchase a license using a deceased individual's identification.

Conclusion

Based on our audit work, we conclude specific ALS processing controls we reviewed function as management intends; however, the identification and flagging of deceased licensees within ALS could be strengthened. FWP should develop a more effective process to identify and flag deceased licensees in ALS. It is our understanding the Department of Public Health and Human Services, Office of Vital Statistics, has experience working with other agencies in developing a direct interface with other applications.

Recommendation #1

We recommend the Department of Fish, Wildlife and Parks:

A. *Develop a routine process to compare Automated Licensing System resident licensees against death records maintained by the Department of Public Health and Human Services, Office of Vital Statistics, and automatically flag licensees who match deceased records.*

B. *Establish a control to check for duplicate records to help prevent the sale of licenses to individuals flagged as deceased in the Automated Licensing System.*

Chapter III – Change Control

Introduction

Information systems are generally a dynamic and fluidly changing environment. Data can be modified and programming code updated to reflect the changing needs of an organization or to remediate flaws. However, because there are risks associated with any programming or data changes, an organization should try to mitigate risks by controlling changes. This occurs through a process called change control which manages changes from the initial request to full implementation. The National Institute of Standards and Technology (NIST) provides guidance to organizations for managing information systems. With regard to change control, NIST states "The organization authorizes, documents, and controls changes to the information system." We reviewed procedures in place for the Automated Licensing System (ALS) to ensure the Department of Fish, Wildlife and Parks (FWP) controls changes to ALS.

Data Changes

Changes made to data by going directly to database tables without using an application's developed software are "back end" changes. These changes are generally made when the use of an application, such as changing information in a person lookup/update screen, cannot correct a piece of data. FWP programmers can make back end changes to data contained in ALS tables. Management stated that, while rare, these types of changes do occur in ALS.

To track data changes, ALS records who makes a change to a row of information in a "last updated" field for each row in a table. The last updated field records all changes made through the back end, the application, and any changes resulting from a batch process potentially producing thousands of changes per day. Most ALS tables do not record full update histories, only the most recent change. However, FWP management stated there are a number of tables they have identified as critical to ALS functionality which record a full history of changes. FWP does not monitor these histories for inappropriate or unauthorized back end data changes.

Individuals allowed to make unmonitored data changes through the back end could manipulate critical data within ALS without authorization. Such manipulation could result in events such as unauthorized individuals obtaining licenses or permits or unauthorized redirection of funds.

The ALS database is comprised of over 300 individual tables. Many of those tables contain thousands of individual rows; one specific table contains millions of individual rows. Agency management stated it is difficult and time consuming to monitor all

data changes. No process exists to screen through the changes made to the tables by all users. FWP management expressed they were unaware of any features which would allow them to isolate changes made by individual users through the back end and provide a means to review those changes in a timely manner. However, we are aware of another agency using the same database software as ALS that has developed a report which isolates users who have made changes to tables through the back end.

Conclusion

Based on our audit work, we conclude FWP is not properly controlling changes to data made through the back end of the ALS. Given that another agency has developed a process to monitor back end data changes, FWP should be able to develop a similar report. In addition, costs should not be excessive for FWP to implement a similar process.

Recommendation #2

In order to ensure unauthorized or inappropriate back end data changes are not being made, we recommend the Department of Fish, Wildlife and Parks:

A. *Develop a report within the Automated Licensing System to isolate changes made by staff with back end data access.*

B. *Routinely monitor report contents to determine if inappropriate or unauthorized back end data changes are being made.*

Programming Changes

Changes made to the underlying code dictating the functionality of an information system are programming changes. Such changes are generally performed by programmers to enhance the system or fix programming errors (commonly referred to as "bugs"). Between 2006 and 2009, FWP recorded 430 enhancements and 687 bug fixes to ALS. Many of the enhancements were considered minor by agency management and included changes to field sizes and the addition of a table. One significant enhancement was the addition of a new user interface for retailers and regional offices using ALS to issue licenses. Many of the bug fixes were associated with the implementation of the new user interface.

FWP stated they employ a three step process for controlling and monitoring programming changes to ALS:

- Tracking programming and data change requests.
- Using a subversion library.

- Managing the migration of programming code to the production environment.

Each of these steps is considered a programming change control. Audit work focused on verifying FWP follows these change control procedures. The following sections discuss each of the change control steps.

Tracker

FWP employs a separate computer application, called Tracker, to approve and monitor the progress of changes to ALS. Requests for enhancements and bug fixes are placed in Tracker by the requester. Requests are reviewed by management, approved/denied, prioritized, and assigned to a programmer. In Tracker, the programmer can review the request, record their progress, and ask questions among other abilities. The requester and management can follow the progress of the request and Tracker sends an e-mail when the status of the request changes. When the programming change is ready to be tested, the requester is notified. Once user acceptance testing is completed and signed off in Tracker by the requester, the change can be migrated to the production environment.

Subversion

Programmers assigned to make changes to ALS programming code access a working copy of the code from the ALS Subversion library. As described by the original Subversion developers:

> "Subversion is a free/open source version control system. That is, Subversion manages files and directories, and the changes made to them, over time. This allows you to recover older versions of your data or examine the history of how your data changed. In this regard, many people think of a version control system as a sort of 'time machine'."

Once a programmer has completed a code change, they are to follow a "check in" process to place the code back into Subversion, recording who, when, and what was changed. When the process is followed, FWP can return to Subversion should something not work correctly and be able to determine what was changed and by whom. The check in should occur prior to migration of the new code into the production version of ALS.

Migration

All ALS servers are housed and maintained by the Department of Administration Information Technology Services Division (ITSD) under an agreement with FWP. The services provided by ITSD include maintaining ALS production code. FWP programmers have the ability to view the production version of the code; however, they do not have the ability to modify the code directly. Migration is the process of moving new programming code from development into the production version of ALS.

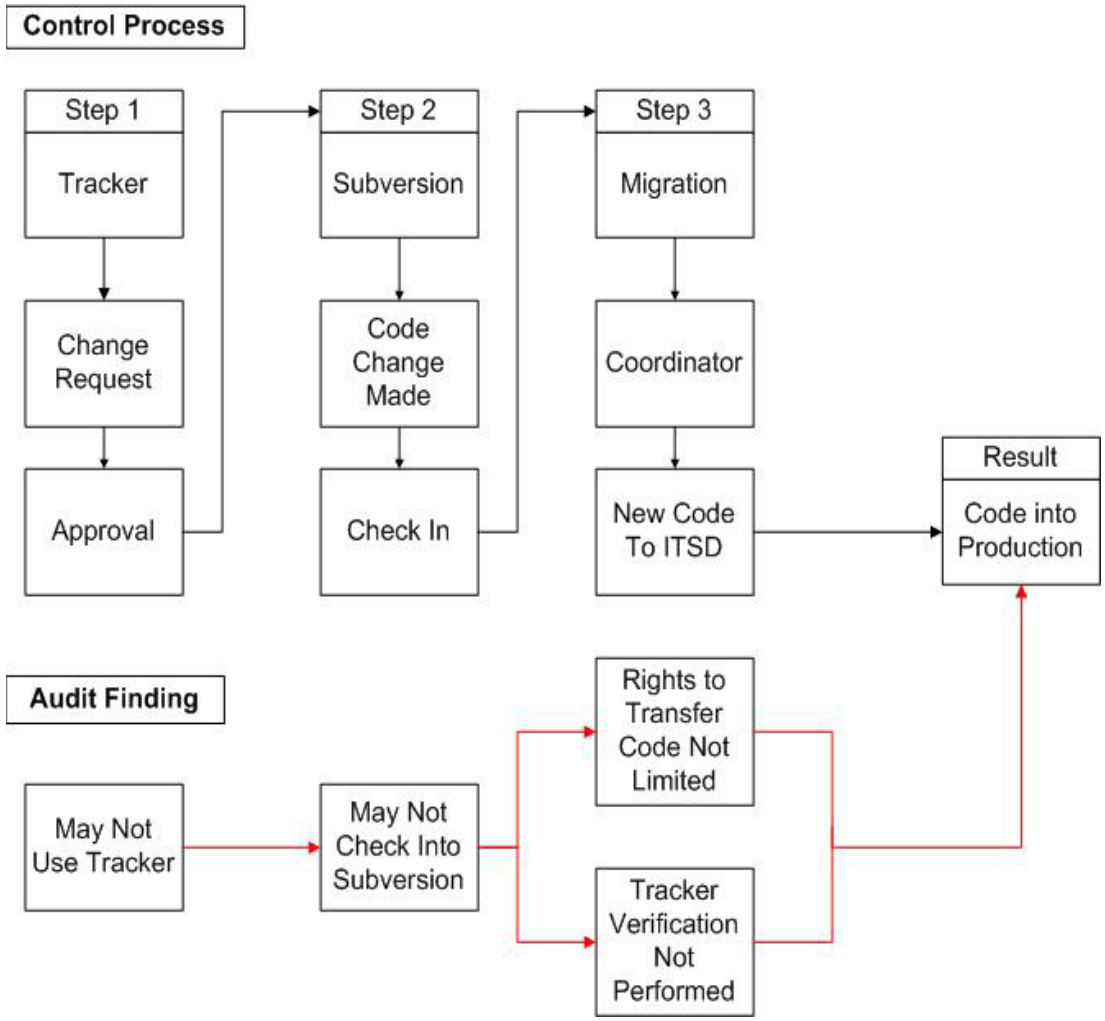
FWP currently has a primary migration coordinator and one primary backup. The coordinator records all requests for migration by logging each request in a spreadsheet. Once logged, the file containing the code is sent to ITSD with a request to migrate it to production.

Effectiveness of Controls

FWP has ALS change control procedures in place. However, as shown in Figure 1, procedures do not have to be followed to get code into production, thus reducing the effectiveness of existing controls.

Figure 1

FWP Programming Change Controls



Source: Compiled by the Legislative Audit Division from information obtained from the Department of Fish, Wildlife and Parks.

During our review, we noted not all change control procedures were required in policy. FWP implemented a new written policy requiring all Application Development Bureau staff to use the Tracker application. Because all programming and back end changes go through the Bureau, management believes this should address all changes to ALS. Although the use of Tracker is mandated in policy, individuals could still fail to follow its required use. An individual could either intentionally or unintentionally fail to log a programming or data change into Tracker.

Similar to Tracker, an individual may not follow the Subversion check in policy, unintentionally or otherwise, and not check in the code prior to migration. Once the new code has been migrated to production, should a programmer not return the working copy of the new code to Subversion, there would be no record of who changed what and when. As with the two previous steps, the migration process, which is not in policy, could be forgotten or skipped. Should the migration coordinator and their backup be unavailable, three other FWP programmers have rights for migration. Thus, any of the five programmers can transfer ALS programming code to ITSD and request migration to production.

Management indicated they rely on the effectiveness of Tracker to monitor changes, and staff to follow Subversion and migration procedures. While we agree change control procedures are in place, they relate to individual steps in the process and do not work in combination with each other. For example, the migration coordinator is not currently required to check Tracker to ensure a change was approved, tested, and signed off by the requester. Additionally, FWP has an application capable of checking the production code on a line by line basis against the Subversion copy to identify differences. Any differences between the two is reported via e-mail to all members of the Application Development Bureau for follow up, thus strengthening the ability to detect unauthorized code changes. However, this process has not been implemented for ALS.

The existing control configuration allows a programmer to develop code (with or without a request), not record it in Tracker, not check it back into the Subversion library, and have it migrated into production, without following any of the change control procedures in place. Strengthening the change control process should improve overall effectiveness.

Recommendation #3

We recommend the Department of Fish, Wildlife and Parks strengthen existing change controls by:

A. *Establishing formal, written policies requiring use of existing change control procedures.*

B. *Further limiting rights for migration.*

C. *Requiring verification of approval and acceptance of programming changes prior to migration.*

D. *Implementing Subversion code check.*

Chapter IV – System Availability

Introduction

Agencies are responsible for maintaining information systems availability in the event of a disaster or major outage. There are a diverse set of outages which could occur, resulting in the loss of systems functionality. Montana has experienced a variety of natural disasters in history including earthquakes, wildfires, and floods. However, disruptions are not limited to natural events and can include human caused events such as denial of service attacks, viruses, programming errors, or sabotage.

To mitigate the damage resulting from major and minor disruptions, agencies need to implement a disaster recovery plan. Specifically, the organization should develop policies, plans, and procedures to regain access to data, workspace, lines of communication, and critical business processes. Once the agency has developed a plan, it should be tested for effectiveness on a regular basis. The results of tests should be documented and any necessary changes should be made to the plan. Additionally, the organization should develop plans for application dependent operations to continue in the interim while the information system is being recovered.

Disaster Recovery Plan

The Automated Licensing System (ALS) is critical to issuing licenses and enforcement of regulations for hunting and fishing; any system outage may result in a loss of ability to issue licenses and thus generate revenue, and an overall inconvenience to sportsmen and women. Although management is aware of the need for a disaster recovery plan and consider it a critical element for ALS, the Department of Fish, Wildlife and Parks (FWP) does not maintain an up-to-date disaster recovery plan for ALS. Additionally, FWP has not completed any internal disaster recovery testing on ALS.

Montana statute requires agency directors to implement appropriate cost-effective safeguards to reduce, eliminate, or recover from identified threats to data (§2-15-104(3), MCA). Additionally, the Service Level Agreement (SLA) between FWP and the Department of Administration, Information Technology Services Division (ITSD) requires FWP to have a disaster recovery plan in place. In addition, the National Institute of Standards and Technology (NIST) provides additional guidance stating, "The organization develops and implements a contingency plan for the information system addressing contingency roles, responsibilities, assigned individuals with contact information, and activities associated with restoring the system after a disruption or failure." ITSD Incident Response policy requires agencies to follow the guidelines set forth in NIST. Incident response is often associated with, and should be a part of, disaster recovery planning.

Management indicated there was some level of assurance that, should an event occur, ITSD would be able to fully recover ALS. However, ITSD is responsible for restoring the underlying hardware and software for ALS and loading the backup data only. The agreement between ITSD and FWP places the responsibility for testing the application and ensuring the accuracy of the data with FWP.

Under the current circumstances, FWP may not be able to fully restore ALS in the event of a disaster which either partially or completely disables ALS. Without an up-to-date disaster recovery plan, FWP does not have details on staff assignments, critical infrastructure, time frames, priorities, etc. ITSD has tested its disaster recovery plan and has been unable to fully restore all aspects of ALS. While each occurrence was a result of a documentation failure, the tests provide evidence of the difficulties of restoring information systems after a disaster, and demonstrate the need to fully document and maintain all aspects of a disaster recovery plan.

According to FWP management, in the interim of recovery, they could fall back on issuing licenses via paper. However, without an up-to-date disaster recovery plan, the agency does not have details on the processes required to move to issuing paper licenses. For example, the length of ALS downtime which will trigger the paper licensing process is not detailed in a formal plan; nor is the potential loss of paper license inventory data, such as the number of paper licenses available and their locations. Also, many retailers and their employees may no longer be properly trained on issuing licenses through the paper method. Additionally, many of the ALS functions, including verification of eligibility to purchase licenses, may be lost in the event of a disaster. For example, ALS monitors purchasing history and interfaces with other outside agency applications to determine residency and legal status of license applicants. These factors could result in a slowing of the licensing process. FWP relies on an automated application to perform drawings for specific tags and the loss of ALS could result in the inability of the agency to perform the drawings, at least in a timely manner. Each of these factors could result in negative public relations and a loss of revenue for FWP. This is especially true in the case of ALS since license revenue accounted for $45.6 million in agency revenues during fiscal year 2009.

Although there can be significant costs associated with maintaining an up-to-date disaster recovery plan, the cost of attempting to recover missing data, purchasing new hardware, and other unplanned operations will be far more excessive. Given the mission of FWP, the agency is not at risk of being permanently unable to recover; however, there will be additional costs and loss of revenue when attempting to recover downed and damaged operations without an effective plan.

Recommendation #4

We recommend the Department of Fish, Wildlife and Parks maintain an up-to-date disaster recovery plan for restoration of the Automated Licensing System in the event of a disruption.

Department of Fish, Wildlife and Parks

Department Response

Montana Fish, Wildlife & Parks

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Dear Ms. Hunthausen: Tori

Montana Fish, Wildlife & Parks' (FWP) is in receipt and has reviewed the 2009 audit report issued on the Automated Licensing System (ALS). FWP's responses to the four recommendations, with subcategories, follow. For convenience, we have excerpted each recommendation, and placed the department's response following each recommendation.

Recommendation #1
We recommend the Department of Fish, Wildlife & Parks:

1A. Develop a routine process to compare Automated Licensing System resident licensees against death records maintained by the Department of Public Health and Human Services, Office of Vital Statistics, and automatically flag licensees who match deceased records.

FWP Response:

Concur.

FWP's Technology Services staff have already begun working with Department of Health and Human Services (DPHHS) staff to implement this recommendation, and a signed memorandum of understanding (MOU) now exists. Even though no incorrect use of a deceased individual's ALS record was identified in the years examined, and the effort to implement this interface may exceed factual savings or return, FWP agrees it is prudent to make reasonable attempts to avoid invalid use of a deceased individual's record. FWP anticipates this interface being implemented within the current fiscal year. It should be noted there are still several limitations with the recommended process:

- DPHHS has a lag time in their records, so "time" for invalid use of each involved record will still exist.
- FWP has been told that **residents** who die out-of-state likely will not have records included in the DPHHS system. This will limit the effectiveness of such an interface and process.
- There may be times when the accuracy of a positive match between the two systems is questionable, based on the available criteria. In some cases, FWP may choose not to flag a record rather than run the possibility of flagging the wrong record.

1B. Establish a control to check for duplicate records to help prevent the sale of licenses to individuals flagged as deceased in the Automated Licensing System.

FWP Response:

Concur.

As described in the audit report, the possible creation of duplicate records would have been the result of a misleading error message. That error message has been changed to minimize or eliminate the possibility of the system misleading the clerk toward the establishment of a new record when the original had been marked as that of someone deceased. However, FWP has chosen to not place the private business in a role of "enforcer". If the license buyer is adamant about their identity and has the appropriate identification, a record is to be created with any necessary cleanup of duplicates anticipated at a later date. As explained to the auditor during interviews, the current system design and construction already attempts to display "possible" matches to a clerk when any new record is being created. This covers all customers and all new record creation. Agent handbooks, and training, instruct clerks to verify whether presented "possibles" are or are not the individual standing in front of the counter. In doing so, the clerk may identify the correct existing record and not create a duplicate. If the clerk does not take the time and effort to perform the verification, a second (or duplicate) record could be created for the individual. Additional processes developed, and annually performed by FWP Licensing staff, are designed to merge or consolidate duplicate records that do end up being created for customers.

Recommendation #2

In order to ensure unauthorized or inappropriate back end data changes are not being made, we recommend the Department of Fish, Wildlife & Parks:

2A. Develop a report within the Automated Licensing System to isolate changes made by staff with back end data access.

FWP Response:

Concur.

Currently, all "back-end" changes noted as a concern by the Legislative Audit Division (LAD) already contain the ID of the individual who made the data change, as well as the date and time of the change. FWP Technology Services staff clearly understand that purposeful unauthorized or inappropriate changes to ALS data can result in termination, and even be career ending. FWP has a formal policy pertaining to back-end changes, with staff aware of the steps they are anticipated to take to document any changes they may be making. However, FWP agrees it is still prudent to monitor data changes to allow recovery or correction if something were inadvertently changed in error, as well as verify that policy is being followed for all other changes. FWP has been provided with a technical contact within the "other agency", and over the course of the upcoming year will work closely and cooperatively to minimize any re-invention or duplication of processes within state government, and to the extent possible put processes in place to provide regular reports of such back-end changes. It is possible that

the other agency's technical situation is, in fact, not "apples to apples" with FWP's technical situation, and therefore not applicable, but FWP will investigate the possibility, and work toward ultimately finding a comprehensive solution.

2B. Routinely monitor report contents to determine if inappropriate or unauthorized back end data changes are being made.

FWP Response:

Concur.

FWP data base administrators (DBAs) already perform several "monitoring" efforts related to "FWP hosted" databases. A complication for ALS efforts have been limits in what the Department of Administration, Information Technology Services Division (ITSD) will authorize as access roles for FWP DBAs. Once a routine or regular report exists for all back end changes of data, held in ALS on ITSD equipment, FWP DBAs will review the reports on a regular basis and inquire where and as appropriate to ensure no changes of concern are made.

Recommendation #3
We recommend the Department of Fish, Wildlife & Parks strengthen existing change controls by:

3A. Establishing formal, written policies requiring use of existing change control procedures.

FWP Response:

Concur.

FWP currently has formal policies related to request submission and tracking (Tracker), and code storage and version control (Subversion). Technology Services staff know what is expected, and that disciplinary action "could" occur if the designated steps are not followed. However, it is true that current change control procedures "could" be sidestepped to get changes in production. To strengthen existing controls, and intending to ensure that existing policy is followed, FWP will formally document and communicate those steps in written policy, with the same consequence. This over-arching policy is anticipated to be in place before the calendar year's end.

3B. Further limiting rights for migration.

FWP Response:

Concur.

FWP currently limits migration rights to those 5 technical staff members that are identified with "primary" support responsibilities for ALS. Existing authority levels were chosen in an attempt to

balance resources, risk and responsiveness. FWP understands and accepts the risks involved with our decisions. As alluded to by the LAD, there are times when scheduled and/or unscheduled absences can result in instances where a single migration coordinator, and backup, is not sufficient to ensure that a migration that is critical or sensitive to FWP's customers can be performed as necessary. Waiting for the availability of such staff is simply not an acceptable option at many points in FWP's business cycle because of the possible volume of customers negatively impacted, or critical deadlines involved. FWP will further examine this issue to identify whether a yet smaller number of employees are possible as backup to ensure that all schedules may be covered. This will likely include adding designated backup staff during times when "scheduled" absences are anticipated, and revoking those authorities when the initial employee returns.

3C. Requiring verification of approval and user acceptance of programming changes prior to migration.

FWP Response:

Concur.

In addition to formally documenting, in policy, a requirement to follow change control policies, FWP will include within the same policy that staff responsible for migrations are also responsible to ensure that appropriate steps have been taken (Tracker, Subversion, and any other appropriate approval) prior to migration. FWP Technical Services management will perform periodic review of migration documentation to ensure that policy is being followed.

3D. Implementing Subversion code check.

FWP Response:

Concur.

Code check currently is in place for database "structure" changes. Code check is not currently implemented for "application software". FWP had already intended, and will implement for smaller internal applications to ensure it works properly, and then will include ALS software in the same process. While FWP will move forward as quickly as possible, it will likely be in the next fiscal year before this recommendation is completely implemented.

Recommendation #4

We recommend the Department of Fish, Wildlife & Parks maintain an up-to-date disaster recovery plan (DRP) for restoration of the Automated Licensing System in the event of a disruption.

FWP Response:

Concur, with qualifications.

Under the initial contract for ALS construction, a DRP related to non-ITSD responsibilities for ALS was produced and delivered. At this point in time it is dated and in need of revision, as suggested by the LAD. The majority of FWP ALS "recovery" actions or testing efforts, are subsequent to and rely on the actual existence of ALS infrastructure and data, which is hosted and provided for by ITSD. With several failed attempts over the years, ITSD has never recovered ALS to the point where FWP efforts could begin. These failures have severely challenged FWP's ability to exercise, validate or revise the DRP delivered by the contractor, test a "recovered" application, or validate "recovered" data through previously defined and documented testing scenarios. As so aptly noted within this report, disasters can occur in many forms and places, and the type and location of disaster is very pertinent to the action required for FWP recovery, or action. It is true that specific details should be formally documented to allow and ensure a smooth transition back to a paper based system, if necessary, and with approximately 100 years of experience with a paper based process, FWP is confident those details can be adequately documented. Most challenges would be of an internal administrative nature as opposed to those affecting FWP's customers. Prior to this report, FWP recognized the risks and limits posed by the current DRP, and it contributed to a decision in 2008 to focus the FWP Security Officer position on Continuity of (technology) Operations. This individual has been working on developing consistent and comprehensive DRPs, and security procedures, for all FWP technology related systems and services. Recent efforts include planning, and upcoming training with ITSD for utilization of the state enterprise's Living Disaster Recovery Planning System (LDRPS). As hinted to within this report, there is much work yet to be done. FWP is in complete agreement and will continue to move forward on development of a current and up-to-date DRP for ALS, and all FWP technology, and will attempt to perform regular recovery exercises to the greatest extent possible, regardless of ITSD's future ability to recover the data and infrastructure as promised and paid for within the ITSD/FWP SLA. It is expected that an initial up-to-date plan can be developed by calendar year 2010 end, with ongoing testing and evolution anticipated.

FWP does recognize the benefits of the LAD recommendations and will strive to implement in as timely a manner as is possible. Thank you for the opportunity to comment.

Sincerely,

Joe Maurier
Director