Summary of Select IT Security Findings 2008-2011		
Security Area	**Summary of Audit Findings**	**Audit Date**
Security Awareness Training	**None of the five agencies we assessed in a 2011 audit consistently provided security awareness training to all new hires and current employees.** People tend to be the weak point in IT security. To minimize this risk, it is important to educate the people in an organization about various IT threats. The state's security policies require agencies to provide security awareness training to all new employees within 90 days, and to retrain employees annually. This training should cover a number of topics including passwords, physical security, social engineering, and viruses. In 2011, we reviewed the security awareness training provided by five agencies (Department of Administration, Department of Education, SRS, Board of Healing Arts, Juvenile Justice Authority). While most of the agencies had developed good training, none of the agencies consistently provided training to all new hires and retraining to current staff.	July 2011
Physical Security	**In a 2008 audit, a lack of security awareness among staff at the Kansas Health Policy Authority (KHPA) allowed a consultant we hired to access confidential documents and obtain some employee's passwords.** We hired a security firm to conduct a variety of very technical security tests of KHPAs network. In addition, we had the firm assess the level of security awareness among KHPA staff by attempting to gain access to their offices and getting them to divulge passwords. Among other things, the firm was able to: • *enter locked offices in the Landon State Office Building and roam around unchallenged.* • *remove confidential documents from file cabinets and bookcases and photograph them.* • *convince some KHPA staff to provide their passwords over the phone.*	August 2008

Summary of Select IT Security Findings 2008-2011		
Security Area	**Summary of Audit Findings**	**Audit Date**
Passwords	**We cracked a significant number of passwords at all of the agencies we assessed in a 2009 audit.** Most agencies now require “complex” passwords—passwords that include three of the four types of characters (uppercase, lowercase, numbers, and special characters). These types of passwords are supposed to be difficult to crack because requiring many types of characters introduces trillions of possible combinations. However, using free password cracking software, we were able to crack between 23% and 58% of the passwords at the agencies we evaluated. This was because employees used predictable patterns in constructing their passwords. For more information on these patterns, see “Passwords That Seem Complex May Be Easy To Crack.”	July 2009
Patch Management	**Three of the five agencies we reviewed in a 2011 audit had significant vulnerabilities because of inadequate workstation patching processes, primarily because of non-Microsoft software.** Over time, vulnerabilities are discovered in software that could allow someone to hack into, or otherwise harm an agency’s network. Manufacturers develop “patches” for these vulnerabilities and it is up to each agency’s IT staff to install the patches and keep the systems up to date. We evaluated the software patching practices at five agencies (Department of Health and Environment, Department of Commerce, Secretary of State, Insurance Department, and Board of EMS). We found that three of the agencies did not adequately patch non-Microsoft software. These three agencies also did not routinely scan workstations for vulnerabilities. Such scans would have identified the missing patches.	December 2011

Summary of Select IT Security Findings
2008-2011

Security Area	Summary of Audit Findings	Audit Date
Surplus Computers	**We were able to recover old files from 10 of the 15 surplus computers we reviewed during a 2008 audit.** Although they may be difficult to find, the vast majority of all documents ever stored on a computer remain on the hard drive forever, unless one of three methods are used to remove the files—physical destruction, demagnetization, or overwriting. We obtained 15 computers from the state's Surplus Property to see whether we could access any old state files. Using inexpensive software ($60 per copy) we downloaded from the Internet: • *We recovered files from 10 of the 15 computers.* • *We found confidential information on 7 computers, including thousands of SSNs, names of Medicaid beneficiaries, and personnel information about state employees.* Software that will erase all files to Department of Defense standards is available for free on the Internet.	June 2008
State Security Policies	**The state's Information Technology Executive Council (ITEC) did a poor job of communicating its security standards to all state agencies.** ITEC developed the minimum security standards for the state. However, in a 2011 audit we found important problems with how ITEC communicated these standards to state agencies: • *ITEC directly communicated with less than half of all state agencies.* • *ITEC did not notify agencies when policies were adopted or amended.* ITEC has historically viewed itself as a policymaking body that appeared to place little emphasis on communicating its standards. It published them on its website but did little else to disseminate them to agencies, greatly diminishing the effectiveness of its standards.	July 2011

- **We cracked a significant number of passwords at each of the four agencies we were able to test, despite the fact that they had decent passwords.** There were two major reasons we were so successful:

  - *<u>Many of the users had "good" but not "great" passwords</u>. Three of the four agencies we tested required complex passwords—passwords that include three of the four possible character types (uppercase, lowercase, numbers, and special characters). However, even complex passwords can be fairly easy to crack, depending on where the user places the numbers or special characters in their passwords. The overwhelming majority of the passwords we cracked met the complexity requirements, but they were constructed in a way that made them easy to crack. For example, a password such as "Password1" contains three of the four possible character types and contains 9 characters, yet is easy to crack. The accompanying profile box provides more information on how to create strong passwords.*

  - *<u>Three agencies used older, weak encryption</u>. As described above, networks store users' passwords in one of two types of encrypted formats, and the weaker one allows passwords to be cracked more easily.*

Passwords That Seem Complex May Be Easy To Crack

One of the important best practices for passwords is to require complex passwords. Complex passwords include a combination of three of the four types of characters on the keyboard—uppercase letters, lowercase letters, numbers, and special characters. The reason such passwords are considered complex is that it takes a long time to try every combination of characters—even for password cracking software. However, that statement assumes that passwords are random.

Unfortunately, people generally don't create random passwords. Studies have shown that when people use <u>uppercase</u> letters in passwords, they tend to use them at the <u>start</u> of the password. When people use <u>numbers</u> or <u>special characters</u>, they tend to use them at the <u>end</u> of the password. People also tend to use only those special characters that are on the top row of the keyboard. When you take those patterns into account, you eliminate a lot of possibilities.

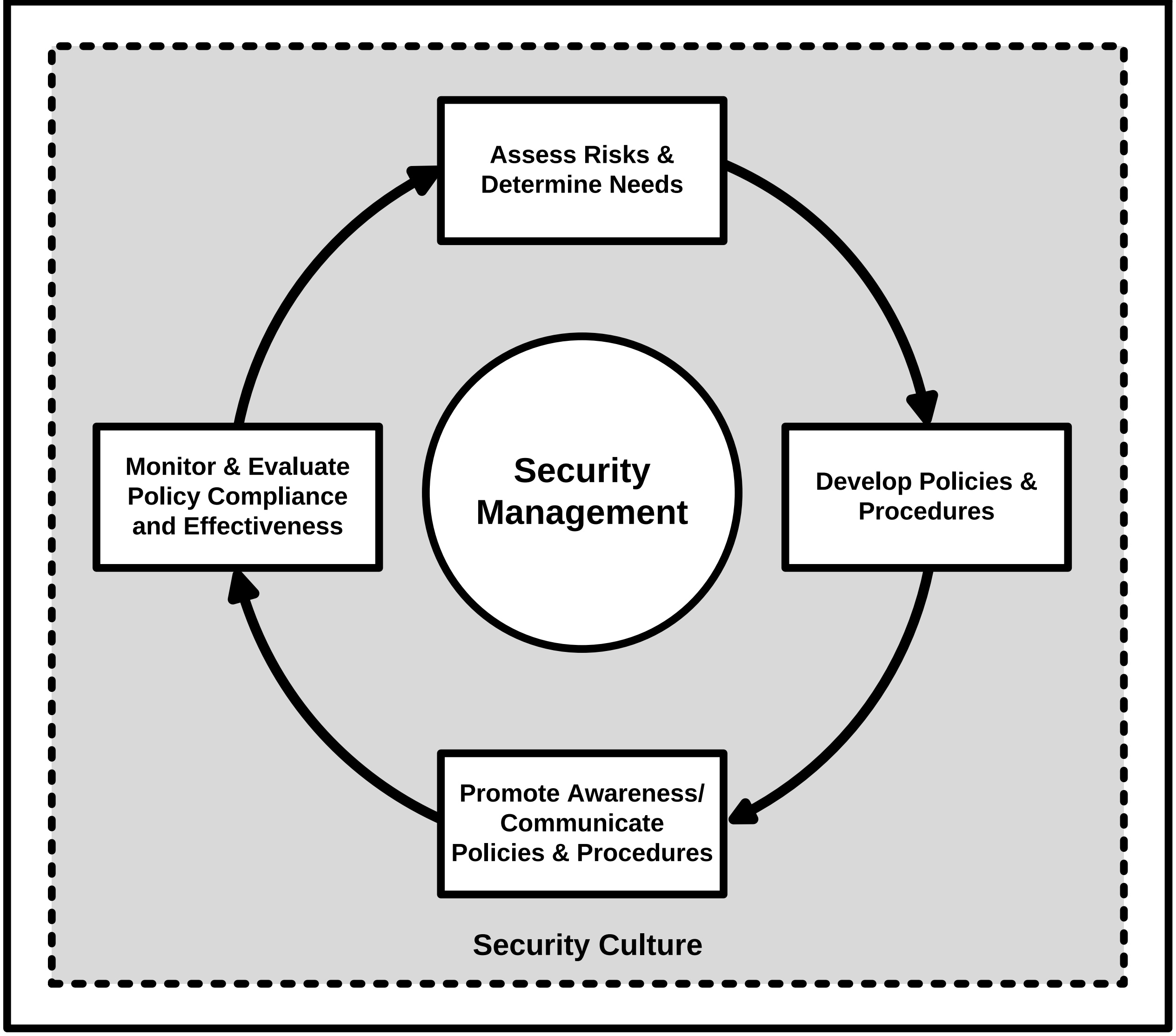
People who develop password cracking software take advantage of these studies. Most software uses dictionary words or combinations of lower case letters for the base of a password, and then randomly substitutes other types of characters at the beginning and end of the password. This method only cracks those passwords that follow the patterns described above, but it may only take one password to break into a system.

Here are a few typical examples of passwords that meet the complexity requirements (each incorporates three of the four types of characters), but are pretty easy to crack (in our case, within five minutes) because of where the numbers and special characters have been placed:

- Computer1
- Mortimer11
- William#1
- Easter12
- steelers#1
- Abcdefg1

There are many strategies for creating passwords that are very strong and easy to remember, but one of the easiest is just to take a dictionary word and mix in some numbers and special characters. From the examples above, if we took "William#1" and made a couple easy changes it could be "wiL#1iam." It's basically the same password, but the character types are in different places. This password would be extremely difficult to crack.

Model Security Management Process for State Agencies


Assess Risks & Determine Needs
Develop Policies & Procedures
Promote Awareness/ Communicate Policies & Procedures
Monitor & Evaluate Policy Compliance and Effectiveness
Security Management
Security Culture

The Kansas Department of Health and Environment Information Systems: Reviewing the Department's Management of Those Systems

This is the third in a series of specialized compliance and control audits designed to focus on an important area of agency operations that generally hasn't been reviewed—the technical aspects of operating information systems. At the direction of the Legislative Post Audit Committee, this audit focused on the management of the Department's information systems. Specifically, we reviewed how well the Department secures its information systems. The audit addresses the following questions:

1. **How well is the Kansas Department of Health and Environment managing the security of its information systems?**

2. **Has the Department done adequate disaster-recovery planning to minimize the loss of computer operations in case of a disaster?**

To answer these questions, we reviewed applicable information system standards and best practices in each of the areas listed above, interviewed KDHE officials, reviewed and evaluated policies and other documentation, and tested selected computer controls used by KDHE in managing its computer systems.

A copy of the scope statement for this audit approved by the Legislative Post Audit Committee is included in Appendix A. For reporting purposes, we've expanded the scope statement's one question into 2.

The criteria we used in reviewing the Department's management efforts came from 2 main sources:

- the Control Objectives for Information and Related Technology (COBIT), published by the Information Systems Audit and Control Association
- the Federal Information System Controls Audit Manual, published by the U.S. General Accounting Office.

In conducting this audit, we followed all applicable government auditing standards. Our findings begin on page 3, following a brief overview.

Overview of the Kansas Department of Health and Environment's Information Systems Function

The Department of Health and Environment (KDHE) is a diverse agency whose mission is to protect and promote the health of Kansans through efficient public health programs and services, and through the preservation, protection, and remediation of natural resources and the environment.

KDHE's Office of Information Services Is Responsible for Computer Operations And Security

This office is located within the Administrative program, and is headed by the Director of Information Systems. It has a staff of 59 FTE positions, 6 of which are currently vacant.

The office is responsible for coordinating the collection, storage, processing, and dissemination of data for KDHE. It also provides support and training on computerized systems and programs to KDHE staff, including the Department's offices in Topeka, the 6 district offices across the State, and multiple county health departments. The director reports directly to the Secretary.

The office of Information Services historically has had 3 main sections:

- Computer Support—18 staff support the desktop computers and provide computer training
- Database/Applications—21 staff create and maintain applications and databases
- Networking Services—10 staff support the network and servers

In addition, a newly created section for Security and Network Infrastructure eventually will have a staff of 5 to handle security and various aspects of the network.

Information Services supports the operational bureaus through a large number of computerized applications, many of which house critical sensitive data. Among the most sensitive applications are those dealing with:

- vital statistics–contains data on births, deaths, marriages, and divorces
- health services for children–contains information on children with special health needs and the services provided to them
- child care licensing–contains information on child care facilities such as background checks, applications, inspections, complaints, and enforcement tracking
- children and families–tracks services provided to clients by county health departments for various programs
- epidemiology–has a database of disease-tracking information from public health providers

Question 1: How Well Is the Kansas Department of Health and Environment Managing the Security of Its Information Systems?

KDHE has adopted many of the necessary policies related to information systems security, but its staff generally haven't followed those policies. As a result, the Department's operations were at a very high risk of fraud, misuse, or disruption. In addition, the Department's data were at an equally high risk of loss or inappropriate disclosure. Some of the problems identified: KDHE was ignoring its password policies and using a fundamentally flawed method of handling passwords. It had misconfigured its anti-virus software, allowing infections of serious viruses to be ignored. And its firewall allowed unneeded access to the network. The Department's policies were inadequate or ignored in several other areas as well. It appeared that a lack of organized security planning allowed the Department's problems to develop and go uncorrected. These and other findings are discussed in the sections that follow.

The Department's Operations Were At an Extremely High Risk of Fraud, Misuse, or Disruption

Today, information technology is becoming more and more imbedded in business strategies and operations. Likewise, technology is increasingly being used to make services more efficient and effective for the public and for State agencies. As a result, keeping information systems and the data in them secure has become an essential function.

Security policies are the core of an organization's security efforts. When we compared KDHE's written security policies against standard best practices, we noted that KDHE had developed 48 of the 58 security-related policies we had expected to see. There were no policies in 10 other areas, including those related to risk and vulnerability assessments, business continuity planning, and server configuration management.

Of the 48 policies KDHE had developed, we concluded that 4 were inadequate. Further, our tests of 20 of these established policies showed that KDHE staff were following only 5 (25%), were partially carrying out 4 more, and weren't following the remaining 11. Because the Department's data systems were at significant risk of fraud, misuse, or disruption, we concluded KDHE needed to take immediate action to protect itself and its data.

To address these risks, we met with the Secretary on August 14 and outlined a series of immediate actions needed to address them. (These recommendations are included as Appendix B of the report.) The Secretary and his staff responded promptly to resolve the issues we had identified. Because those security-related issues were resolved, we are able to discuss them freely in the following sections. Other findings are reported in more general terms.

KDHE's method of issuing and handling passwords was profoundly flawed, giving any former or current employee—and most hackers—fairly easy access into the agency's network and data. Passwords are the most commonly used method for controlling access to computer systems, but they are also the weakest form of access control. As a result, it's important to have good password controls and to rigorously enforce those controls, especially for an agency that has as much confidential data as KDHE.

KDHE had established policies related to password controls that addressed most of the standard recommended security procedures. However, we found that it wasn't following any of them. For example:

- employees were issued passwords using one of two simple, easy to guess patterns
- users weren't required to change their passwords on a periodic basis; in fact, most user accounts were set to not allow users to change their passwords
- none of the network password settings were enabled (in other words, no password controls were being used on the network)
- no limits were set on the number of unsuccessful password guesses allowed before the account was locked

Using standard password cracking software, we were able to crack more than 1,000 of the agency's passwords (about 60% of the total) in 3 minutes. Within 11 hours, we had cracked 90% of its passwords. The most important passwords are those of the network administrators. These passwords can access just about anything and give the user nearly unlimited power on the network. We cracked 15 of 21 administrative passwords in our test, including 4 within 2 minutes.

Given the simple pattern to KDHE's assigned passwords and the absence of any of the standard security controls, current or former employees would have been able to log onto most KDHE employees' computers within just 2 attempts. Any actions taken while logged onto that employee's computer would appear to have been made by the employee, not by the intruder. This weakness put the entire network and all agency data at severe risk.

The Department's anti-virus system was badly flawed, allowing computers to become infected with a large number of different viruses, worms, and trojan horses. Although KDHE's policies on virus control generally were adequate, we found that those policies weren't always followed. When the Department's new security officer checked the software in early August, she found that it wasn't set up correctly. Four major things were wrong:

- the system the software uses to distribute the patterns used to identify new viruses to servers and computers was misconfigured, preventing many computers from receiving the necessary virus protection updates
- on many computers, the software was set to ignore viruses
- nearly 200 computers didn't have anti-virus software installed
- the software was logging the infections that occurred, but no one was looking at the logs

The security officer found that at least 30 computers were infected with 16 different viruses, worms, and trojan horses. Although a few of the viruses were fairly harmless, 16 computers had viruses or trojan horses that could send files and passwords from the computers to addresses outside the agency.

In addition, 2 of the viruses could install programs that record all keystrokes made on the computer. (There's no way to tell if any data actually were sent outside the agency.) Some computers had multiple cases of these viruses, some had been infected for months, and one computer had a list of infected files more than 9 pages long.

The Department Supplemented Our Audit Work With a More Technical Review by a Consulting Firm

In response to one of the recommendations we made on August 14th, the Department contracted with Fishnet Securities, a large midwestern network security consulting firm, to do an in-depth vulnerability assessment audit. Because of the severity of the higher-level problems we identified, we thought it important for the Department to identify the depth of its technical problems. In late August, Fishnet conducted tests of:

physical security controls–a Fishnet employee tested physical controls by wandering around the Department's offices in Topeka picking up files and laptop computers from various offices.

external network vulnerabilities–Fishnet used vulnerability checking software to scan various servers and workstations on the network that are accessible from the Internet to identify areas where the machines were vulnerable to attack from outside the network.

application vulnerabilities–Fishnet used software designed to check computer applications for vulnerabilities. Vulnerabilities in applications are ignored by most security scans, but are becoming significant areas of risk for organizations. This is especially true for web-based applications. These vulnerabilities are often harder to address than network-level vulnerabilities.

wireless network vulnerabilities–These tests monitored for vulnerabilities in wireless applications, and tested for rogue wireless equipment (wireless equipment hooked to the network that wasn't authorized by the Department).

In their final report, Fishnet identified a number of vulnerabilities that the Department is beginning to address.

The Department's firewall was poorly configured, creating several large holes into and out of the agency. Firewalls create protected borders between the Internet and the agency's internal network, or between different portions of a network. In order to communicate with the outside world, small openings are created in the firewall to let particular groups of people in or out to do particular things. Some openings need to be large—such as letting anybody who's inside the network out to browse the Internet. Other openings may be very small—such as allowing a particular computer in to do one particular thing.

We noted that the openings in KDHE's firewall granted far more access than was necessary or prudent. For example, the firewall:

- opened the entire internal network to the Department of Administration's Division of Information Systems and Computing
- opened internal servers housing sensitive databases to the "demilitarized zone" (the less-secure portion of the network between the public Internet and the highly protected internal network)
- put one server completely outside the firewall, leaving it unprotected from hackers

KDHE had no organized system of tracking user activity. Audit trails within computer systems provide accountability. They allow staff to track important actions—such as successful and unsuccessful log-in attempts, changes to access privileges, and files that have been accessed. Without such logs, it's nearly impossible to track what happened during a security incident.

KDHE had developed adequate policies in this area, but we found that security logs had not been turned on for some servers, that there were no logs on any of the desktop computers, and that no one periodically monitored the activity reported on the logs that did exist.

Many Other Security-Related Policies Were Missing, Inadequate, or Not Being Followed

The problems we identified are summarized below:

- KDHE had no written procedures related to incident response and reporting. Such procedures establish guidelines for how staff are to respond to various types of security incidents. They are important so that staff will know what to do in case of a serious security incident (such as cutting off an intrusion immediately, or tracking the intruder long enough to collect the information needed to prosecute the attacker), and who is to do it. Speed is also essential in responding to such an attack in order to protect agency data. We also noted that the general policies in this area made operational bureaus within KDHE responsible for investigating security incidents. Such investigations should be the responsibility of the IS department.

- KDHE wasn't following its policy requiring security to be considered at each stage of a system development project. System development literature shows that security is often added at the end of a software development project, or after a project has been completed. Building in security early in the project results in more secure systems and costs far less. Best practices call for security plans to be developed for all projects under development, and for each phase of system development to include assurances of security and audit controls. KDHE had such a policy, but hadn't implemented it.

- KDHE wasn't following its policies on physical security. During one lunch hour, our staff and KDHE's new security officer were able to enter empty offices on 3 different floors to check the computers, and were only questioned by one person. Many computers were logged onto the network and unlocked. We also found an unlocked wiring closet, and noted that the area where new computers were setup was unlocked and unoccupied

- KDHE has no policies or procedures on network banner language. A network banner is a welcoming screen that comes up when someone starts to log onto a computer. Its purpose is to provide notice of legal rights to users of the network. They generate consent for administrators to monitor activity and to retrieve files and records. Without such banners, KDHE might have trouble prosecuting hackers or monitoring the network for unauthorized activity. KDHE has been considering some banner language for some time, but hasn't adopted it.

- KDHE didn't have a policy for documenting how its servers were configured. Such documentation is important to ensure that any servers that have to be replaced or rebuilt are configured correctly and securely. Mistakes in configuration can often open a server to a hacker.

- KDHE wasn't always following its policies to delete the user accounts of employees who leave the agency. We checked the accounts of 35 employees who had left KDHE in the past year and found about a third to still be active. Leaving these accounts active allows non-employees to have access to the network and files.

- KDHE wasn't following its policies on protecting sensitive agency data on laptops. Possible ways to protect such data: keeping it on diskettes or other removable media, encrypting the documents, and using cable locks to physically secure the laptops.

- KDHE had no policy for ensuring that its security staff get continuing education on an ongoing basis. In addition, officials reported that none of the programmers developing new applications had been provided any security training. Training is especially important for programmers developing web-based applications.

The Department Could Have Discovered and Resolved These Problems Using Adequate Security Management Planning

Without good security planning, there's an increased risk agencies will have poor security over their information systems, or will focus their security resources in the wrong directions. Security planning should be an on-going cycle of activity. A U.S. General Accounting Office study of the leading non-federal organizations with the most successful security-management functions found that these organizations use 5 common risk-management principles:

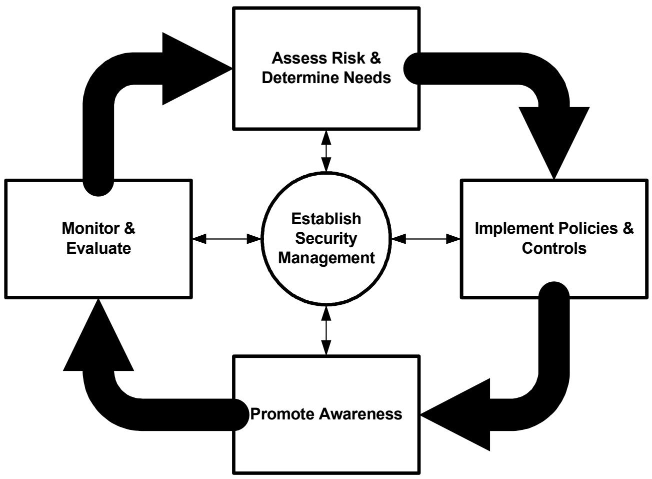
- periodically assess risks
- establish a security-management structure, and clearly assign security responsibilities
- document an entity-wide security plan
- promote security awareness
- monitor the security program's effectiveness, and make changes as needed

These principles form a cycle of activity that can help organizations ensure their security policies are current and address risks on an ongoing basis. As staff go through the cycle, they receive feedback on how well risks are being mitigated, and whether there are risks that are being missed. Weaknesses in how the system is working are continuously pointed out.

We compared the Department's security management processes and practices with this list of critical elements. Our findings are summarized in the following sections.

The Information Systems (IS) office has never done a risk assessment of KDHE's security vulnerabilities. The IS director told us the operational bureaus do informal risk assessment as applications are being developed. However, this is only a small part of what is needed. A risk assessment is the base from which all security policies and plans should flow, and allows agencies to identify where their security systems are most vulnerable. It can also help them decide where to focus their limited security resources.

Risk Management/Security Planning Cycle


Assess Risk & Determine Needs
Monitor & Evaluate
Establish Security Management
Implement Policies & Controls
Promote Awareness

Source: Information Security Management: Learning from Leading Organizations, General Accounting Office, May 1998

The internal committee KDHE formed to develop security policies and procedures and coordinate security failed to complete its job. In 2001, KDHE formed a committee of upper-level managers from all parts of the Department to develop security polices and manage security. The Security Council, as it was called, was chaired by the IS director. Designating a central group to handle security is an important element in the planning process.

The Council developed a set of policies, but as described earlier, many of them didn't address some important entity-wide security issues. In addition, those policies clearly don't flow from an assessment of risks. For example, the agency has been working on establishing more web-based applications for epidemiology, vital statistics, and child care licensing. However, no policies or procedures have been developed to address the greater risks of such applications which arise from being so much more exposed to the internet.

We also noted that the Council never followed through on its other responsibilities--to develop procedures and to monitor security. The IS director told us he didn't reconvene the Council because of a lack of time.

KDHE's recent decision to create a security officer position and hire a highly qualified person to fill that position will go a long way towards improving security management. The IS director told us the security officer would chair of the Security Council, which will begin meeting soon to reevaluate the security policies and to carry out its other responsibilities.

KDHE staff generally weren't monitoring security issues, and didn't use intrusion detection equipment or vulnerability checking software. Information system security involves a complex set of activities that are continually in flux, and that involve a number of people. Even under the best of circumstances, it's difficult to maintain security at an acceptably high level. The only way for upper-level management to ensure that security policies are carried out and remain effective is to monitor those policies and controls. Monitoring can take many forms, such as auditing, reviewing software and hardware configurations, using vulnerability checking software and other network utilities, regularly reviewing security logs, and conducting self-assessments.

We found little evidence that active monitoring was occurring. For example, if anyone had checked to see if the weekly anti-virus updates were getting done, or had reviewed the virus logs to see if any machines had become infected, they would have discovered the anti-virus software wasn't working as intended. The network manager also told us that when something suspicious happened, he would consult the security logs to investigate. However, the logging function wasn't even turned on for many KDHE servers, and none of the employees' computers had it enabled. As a result, if an intrusion was discovered, it would be hard to investigate unless it happened on one of the servers with logging enabled. In addition, the network manager apparently had a basic misunderstanding of the security policies and of his staff's role. The policies give important roles to "data custodians" including several monitoring responsibilities. The IS director told us that the IS office was the data custodians, but the network manager thought that the operational divisions of the agency were the custodians.

KDHE's security policies don't address security awareness. Regular employees are generally considered to be the most significant security risk in any organization. Therefore, it's imperative to educate employees about security and the important role they play in the process. Although the computer support section has undertaken some security awareness activities, mainly focusing on viruses and passwords, no formal classes have been offered on security. (Ironically, at the same time the support staff were asking people to change their passwords, the network staff were setting accounts to not allow users to change passwords.)

Conclusion

Before this audit, the Department's computer systems were at an extremely high risk of fraud, misuse, or disruption, and its computer data—much of it confidential—was at an equally high risk of loss or inappropriate disclosure. This situation developed over time through a combination of factors, but the main cause appears to have been a fundamental lack of understanding of computer security by key staff who were charged with that responsibility, and a failure to recognize or act on problems that existed. The Department has acted strongly and swiftly to address these problems—including hiring a respected consulting firm to identify the depth of its technical problems. By taking these actions, the Department has already started lowering the high level of risk that existed at the start of the audit. By implementing the additional recommendations made in this audit and the consultant's report, and by continuing to focus on its critical computer security needs, the Department should be able to overcome these problems and put a security program in place that identifies and mitigates risks before they are realized.

Recommendations

1. To ensure that it manages the security of its systems effectively and efficiently, KDHE should adopt a system of security planning similar to the one described in this report. As a part of that process, KDHE should:

   a. reinstitute the Security Council with the security officer as the chair

b. have the Information Systems Office conduct an annual agency wide risk assessment with participation of staff from the operational bureaus
c. have the Security Council use the results of the risk assessment to evaluate and update the security policies annually
d. have the security officer develop a security monitoring procedure to help ensure that security policies and controls address risk areas effectively, and that staff comply with the policies
e. evaluate IS staff job descriptions and insert security duties in those job descriptions where appropriate

2. In evaluating the security policies, the KDHE Security Council should consider developing the following written policies or procedures:

a. a risk management policy requiring periodic risk assessments designed to identify what the Department's major risks are, and where security controls are needed to mitigate those risks
b. incident response and reporting procedures that establish guidelines for how staff are to respond to security incidents. It should also form an incident response team of both IS and operational staff to carry out the procedures.
c. an accountability policy specifying what types of audit trails are to be maintained, how long they are to be maintained, and a more detailed requirement on the periodic review of logs
d. a configuration management procedure for servers and workstations. It should also adopt a standard for securely configuring different types of equipment.
e. a continuing education policy for security staff and programmers to help ensure that staff keep up-to-date on security issues
f. a security awareness program for KDHE staff
g. a policy requiring servers and computers to be kept current on security patches
h. a policy requiring that a network banner be displayed on each computer upon login that meets legal requirements for warning away unauthorized users, and for notifying legitimate users of privacy restrictions and network monitoring

3 The Information Systems director should ensure that his staff follow existing policies and procedures, including the policies that require:

a. password controls to be used
b. periodic auditing and monitoring of security
c. employee computer accounts to be disabled or deleted when an employee leaves the agency

   d. screen saver passwords to be enabled
   e. laptops to be stored securely
   f. sensitive data on laptop computers to be encrypted
   g. security to be considered during each phase of software development projects

4. To avoid further problems developing because of a lack of communication, the Information System director should ensure that the different sections within the IS Office become less isolated and communicate more effectively.

5. Before the start of the 2004 legislative session, the Department should provide Legislative Post Audit with a corrective action plan for addressing these recommendations and those made by the consulting firm. The plan should prioritize the problems and specify a time schedule for addressing them.

Question 2: Has the Department Done Adequate Disaster-Recovery Planning To Minimize the Loss of Computer Operations in Case of a Disaster?

Business continuity planning addresses an organization's ability to continue functioning when normal operations are disrupted. KDHE hasn't done any business-continuity planning since 1999, increasing the risk it won't be able to respond in the event of a disaster.

An Organization Needs Good Business Continuity Planning In Order To Quickly Recover Critical Operations After a Disaster

Business continuity planning addresses an organization's ability to continue functioning when normal operations are disrupted. By necessity, it includes planning for contingencies and is focused on the information system functions that are the most critical to continue agency operations. Often this is called disaster-recovery planning.

Good business continuity planning involves the following:

- developing a written continuity plan that is in line with the agency's objectives
- testing the plan and keeping it up-to-date
- making sure each employee knows their responsibilities as specified in the plan
- establishing adequate off-site storage for critical backup tapes
- developing alternative processing procedures for user departments to implement until processing can be restored

The continuity plan itself discusses the most likely types of disasters and specifies detailed steps to take to recover services, including assigning specific roles and responsibilities to specific staff members.

KDHE Lacks the Tools Necessary To Recover Operations Quickly After a Disaster

KDHE developed a business-continuity plan for Y2K, but hasn't updated that plan or done any other continuity planning since 1999. We found that the IS office does have a good system for backing-up servers and databases, and has off-site storage of the backup tapes. However, there are no policies concerning business-continuity planning, and the plan left over from Y2K would be nearly useless in an ordinary disaster.

The plan itself does have some good features that would be useful in making a plan. Each business unit in the agency has a section with a concise summary of the work flow as well as manual alternatives to use if computer access isn't available. However, the plan doesn't address the issues that a business continuity plan should address such as:

- possible disaster scenarios with appropriate reactions for each
- roles and responsibilities of specific staff so that people will know what to do

- logistical information on location of key resources such as backup site, applications, data files, and operating manuals
- lists of resources needed to restore operations, such as computers, ancillary equipment, and supplies
- procedures for getting replacement servers and computers ready to load applications and data
- procedures for resuming operations in the original location after the disaster is over

Without an effective plan, the Department's staff would have access to backup data if a disaster affected the central office, but they would have no action plan to let employees know what equipment, software, or supplies they needed to collect, where they should go, or what they should do.

Recommendations

1. To help ensure that it can continue functioning when normal operations are disrupted by a disaster, KDHE should approve policies requiring it to conduct business continuity planning, which would include the following:

   a. a risk analysis that assesses the most likely disaster scenarios
   b. a disaster recovery plan that addresses the disasters most likely to befall the Department. This plan should assign roles and responsibilities to specific staff, and present specific steps for staff to follow in recovering computer operations.
   c. arrangements that allow KDHE to continue offering computer services in case the central office computers aren't available for a period of time. This could include having redundant servers at an off-site facility, or contracting with a vendor that offers off-site computing capability.
   d. training staff in how to use the plan in the event of an emergency
   e. conducting periodic testing of the disaster recovery plan

SCOPE STATEMENT

State Agency Information Systems:
Reviewing Security Controls in Selected State Agencies (CY 2012)

Each year, most state agencies collect and process sensitive and confidential data in their computer systems, including citizen social security numbers, medical information, and income data. Some agencies are responsible for protecting millions of confidential records, which makes them a potentially enticing target for hackers.

Often, agencies use multiple security layers to protect data and computers from cyber or physical attack. Potential security layers include physical security, perimeter security, and host security. Because no one layer can protect an agency against all threats, it is important to have multiple controls that complement each other and are independently secure. Weak or missing layers can create cracks in the agency's overall security, which increases the risk for agency data to be compromised.

Currently, there is limited oversight of agencies' security controls to ensure that agencies are adequately protecting confidential data. The Kansas Information Technology Executive Council (ITEC) has developed guidance to assist state agencies in developing adequate security controls, but ITEC doesn't monitor or audit how well those controls are implemented. Consequently, agencies have a significant amount of autonomy in how they develop, apply, and monitor security controls.

The Legislative Post Audit Committee approved information system audits as an adjunct to the Division's compliance and control audits. This information system audit looks at seven important information technology security areas across a broad selection of state agencies.

This information security audit answers the following questions:

1. **Do selected state agencies have an adequate security management process to assess, manage, and monitor IT risks?**

2. **Do selected state agencies adequately control passwords?**

3. **Do selected state agencies provide adequate security awareness training to all staff?**

4. **Do selected state agencies adequately patch servers and workstations?**

5. **Do selected state agencies adequately secure network access points?**

6. **Do selected state agencies adequately inventory and track IT hardware?**

7. **Do selected state agencies have adequate policies and procedures for continuing operations in the event of an emergency?**

To answer these questions, we would perform an overall evaluation of each agency's security management process. Specifically, for each security area, we would review agencies' policies and procedures and compare them to state IT requirements and best practices. We would also interview agency officials and staff to determine how well policies and procedures are being followed in practice, and would survey agency staff to determine their knowledge of IT policies and procedures. Where possible, we would perform direct test work to determine whether agency actions in these security areas where achieving the intended results. We would perform additional work in these areas as necessary.

Estimated resources: 3 staff for 9 months (plus review)

Agencies Selected for Audit (2012)

1. Commerce, Department of
2. Corrections, Department of
3. Education, Department of
4. Juvenile Justice Authority
5. Labor, Department of
6. Revenue, Department of
7. State Board of Indigents' Defense Service
8. State Treasurer
9. Wildlife, Parks and Tourism, Department of