AUDIT REPORT

CITY OF NEW YORK
OFFICE OF THE COMPTROLLER
BUREAU OF FINANCIAL AUDIT
WILLIAM C. THOMPSON, JR., COMPTROLLER

Audit Report on the Implementation of The Electronic Death Registration System by the Department of Health and Mental Hygiene

7A09-083

November 24, 2009

THE CITY OF NEW YORK
OFFICE OF THE COMPTROLLER
1 CENTRE STREET
NEW YORK, N.Y. 10007-2341

WILLIAM C. THOMPSON, JR.
COMPTROLLER

To the Citizens of the City of New York

Ladies and Gentlemen:

In accordance with the responsibilities of the Comptroller contained in Chapter 5, §93, of the New York City Charter, my office has audited the implementation of the Electronic Death Registration System (EDRS) by the Department of Health and Mental Hygiene (DoHMH).

EDRS is designed to be a Web-based, paperless, and user-friendly system with security features to be accessed by authorized and registered New York City hospitals, medical providers, and funeral homes. DoHMH began using the system in 2006 for its paper-based death registration, with a link to the Social Security Administration for verification of decedents' Social Security numbers. We audit City agency programs such as this as a means of ensuring that they operate efficiently and as intended.

The results of our audit, which are presented in this report, have been discussed with officials of DoHMH, and their comments have been considered in preparing this report. Their complete written response is attached to this report.

I trust that this report contains information that is of interest to you. If you have any questions concerning this report, please e-mail my audit bureau at audit@Comptroller.nyc.gov or telephone my office at 212-669-3747.

Very truly yours,

William C. Thompson

William C. Thompson, Jr.

WCT/fh

Report: **7A09-083**
Filed: **November 24, 2009**

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Office of the Comptroller
Bureau of Financial Audit
IT Audit Division

Audit Report on the Implementation of the Electronic Death Registration System by the Department of Health and Mental Hygiene

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AUDIT REPORT IN BRIEF

We performed an audit on the implementation of the Electronic Death Registration System by the Department of Health and Mental Hygiene (DoHMH). DoHMH's mission is to promote and protect the health and mental health of all New York City residents. Among DoHMH's responsibilities is the registration and issuance of birth and death certificates. DoHMH's Bureau of Vital Statistics (Vital Statistics) is responsible for issuing all Certificates of Death for deaths that occur within the City of New York. The Burial-Death Registration Unit (Registration Unit) of Vital Statistics records information pertaining to each death in the DoHMH computer system and issues certified death certificates and permits for the burial, cremation, and transportation of human remains.

In 1998, the department began a system development initiative known as the Electronic Death Registration System (EDRS) to automate the functions of the Registration Unit. The initial effort was developed by IBM at a cost of $3.2 million but did not achieve the level of stability and functionality for deployment required by the Department. In April 2002, DoHMH started the second EDRS implementation effort. Dynamic Services International, Inc., (Dynamic) in partnership with VitalChek Network, Inc., (VitalChek) was selected as the vendor, at a total fixed cost of $1.3 million.

On March 31, 2003, VitalChek was assigned and assumed the EDRS contractual responsibilities of Dynamic. By 2004, a national model of standards for an EDRS was released by the National Association for Public Health Statistics and Information Systems (NAPHSIS)[1] as a guide to assist states and jurisdictions interested in EDRS development. VitalChek agreed to adopt the national model in its New York City EDRS development and implementation over an approximate two-year time frame.

EDRS is designed to be a Web-based, paperless, and user-friendly system, with HIPAA-compliant[2] security features to be accessed by authorized and registered New York City

[1] NAPHSIS is the National Association for Public Health Statistics and Information Systems. It is a not-for-profit membership organization representing the state registrars and directors of vital statistics in the United States.

[2] Health Insurance Portability and Accountability Act (HIPAA) was enacted by the U.S. Congress in 1996. Its Administration Simplification provisions address the security and privacy of health data.

hospitals, medical providers, and funeral homes. Access is generally via the Internet to DoHMH's Web interface, NYC MED. The development and implementation of EDRS was completed in June 2008. The system is currently on contractual annual maintenance with VitalChek until the year 2017.

Audit Findings and Conclusions

EDRS functions reliably, and information recorded in the database is accurate and secure from unauthorized access. EDRS is based on the national EDRS standards model, allows for future enhancements or upgrades, and was completed within original cost and time estimates.[3] It has a disaster recovery and business continuity plan in place. Users are generally satisfied with the system.

However, we concluded that there were reporting and performance-monitoring issues that should be resolved to improve system usefulness. In terms of reporting, we noted that the EDRS capability to generate ad-hoc reports needs improvement, and that existing EDRS standard reports have not been fully tested for elimination of errors. With regard to performance-monitoring, we noted that the system could not produce a systems performance report showing daily scheduled maintenance, unscheduled maintenance, and downtime. In addition, DoHMH needs to develop a policy and procedures for handling future EDRS enhancements or upgrades, and review all open items previously recorded in Web Tracker for problem resolution.

Audit Recommendations

To address the audit issues, we make five recommendations, that DoHMH:

- Have the vendor correct the EDRS ad-hoc reports-generating capability to meet the required specifications.
- Test all available EDRS standard reports produced by the system, request resolution of all reports where problems were noted, and test the reports after the problems have been addressed.
- Institute or develop a proper system monitoring facility and set it to record EDRS service performance.
- Develop a policy and procedures for handling EDRS enhancements or upgrades.
- Review the status of all issues reported in Web Tracker, and where appropriate, close the reported issues and institute a stricter monitoring and periodic updating procedure for all those issues.

[3] The latest EDRS project had an original fixed cost of $1.3 million. It was to be completed within the two-year time frame of adoption of the national EDRS standards model (as prescribed by NAPHSIS in November 2004) by the vendor VitalChek.

INTRODUCTION

Background

The Department of Health and Mental Hygiene was created in 2002 by a merger of the Department of Health and the Department of Mental Health, Mental Retardation and Alcoholism Services. DoHMH's mission is to promote and protect the health and mental health of all New York City residents through health promotion and disease prevention programs and the enforcement of City health regulations. DoHMH programs and activities include: providing health information and laboratory services; performing disease investigations and surveillance; inspecting, permitting, licensing, and monitoring a wide range of enterprises related to public health; maintaining the City's health-related vital statistics; and registering and issuing birth and death certificates.

DoHMH's Bureau of Vital Statistics is responsible for issuing all Certificates of Death for deaths that occur within the City of New York. The issuance of each certificate is predicated on authorized signatures of a New York State-licensed physician who states the cause of death and the overseeing funeral director who is responsible for the disposition of the deceased. The majority of deaths (approximately two-thirds) within the City occur in a hospital or nursing home. The Burial-Death Registration Unit (Registration Unit) of Vital Statistics records information pertaining to each death in the DoHMH computer system and issues certified death certificates and permits for the burial, cremation, and transportation of human remains.

In 1998, the Department of Health (as it was then known) began a system development initiative known as the Electronic Death Registration System to automate the functions of the Registration Unit. The initial effort was developed by IBM at a cost of $3.2 million, but did not achieve the level of stability and functionality for deployment required by the Department for a number of underlying reasons.[4]

In 2002, the Social Security Administration released a grant to Public Health Solutions[5] to fund a national team whose purpose was to develop standards for the implementation of a nation-wide EDRS. In April 2002, DoHMH started the second EDRS implementation effort. Dynamic Services International, Inc., in partnership with VitalChek Network, Inc., (VitalChek) was selected as the vendor, procured through a bid solicitation process via a New York State Office of General Services (NYS OGS) requirements contract[6] at a total fixed cost of $1.3 million.

On March 31, 2003, VitalChek was assigned and assumed the EDRS contractual responsibilities of Dynamic. By 2004, a national model of standards for an EDRS was released by the National Association for Public Health Statistics and Information Systems (NAPHSIS) as

[4] As concluded by Comptroller's Office audit report, *Audit Report on the Development and Implementation of the Electronic Death Registration System by the Department of Health and Mental Hygiene*, 7A03-073, issued on June 23, 2003.

[5] Public Health Solutions (Formerly Medical and Health Research Association of New York City, Inc.) is a non-profit organization established by the NYS Public Health Council to work with the NYS Department of Health and other statewide organizations to address the leading health problems affecting New Yorkers.

[6] Bid solicitation was performed through the NYS OGS contract mechanism using a project definition, which was agreed to by the vendor in its proposal to perform at the fixed cost of $1.3 million.

a guide to assist states and jurisdictions interested in EDRS development. VitalChek agreed to adopt the national model in its New York City EDRS development and implementation over an approximate two-year time frame. The financial terms of the original agreement were unchanged.

EDRS is designed to be a Web-based, paperless, and user-friendly system, with HIPAA-compliant security features to be accessed by authorized and registered New York City hospitals, medical providers, and funeral homes. Access is generally via the Internet to DoHMH's Web interface, NYC MED.

The key control features of EDRS are in the rules for database-entry and edit controls, verification of Social Security numbers, biometric authentication, and the individual examination of each case as it is being filed during each step of the death registration process. An example of the latter control is for the issuance of a burial permit, DoHMH must review and approve information entered by a funeral director before the permit can be printed at the funeral home. The combination of data entry rules and verification of vital information, the biometric-based authentication of medical providers and funeral directors, and the DoHMH staff review of each death registration prior to approval are intended to make erroneously filed death certificates a near impossibility.

During 2005-2006, DoHMH began the process of recruiting hospitals and funeral homes to use EDRS. However, funeral homes were reportedly reluctant to use the system and preferred hospitals to be enrolled first. In 2006, DoHMH began using the system for its paper-based death registration, with a link to the Social Security Administration for verification of decedents' Social Security numbers. Federal funding acquired during 2007-2008 helped DoHMH aggressively promote EDRS to hospitals through extensive on-site training and support. However, the adoption rate of EDRS by funeral homes remains slow, partially due to the voluntary nature of using the system. The development and implementation of EDRS was completed in June 2008. The system is currently on contractual annual maintenance with VitalChek until the year 2017.

Objectives

The objectives of the audit were to determine whether:

- EDRS functions reliably, and information recorded in the database is accurate and secure from unauthorized access,
- The system design allows for future enhancements or upgrades,
- EDRS has been built within the anticipated cost estimate,
- Users are satisfied with the system, and
- A disaster recovery plan has been devised for EDRS and it has been incorporated into the DoHMH disaster recovery plan.

Scope and Methodology

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. This audit was conducted in accordance with the audit responsibilities of the City Comptroller as set forth in Chapter 5, §93, of the New York City Charter. However, as disclosed in the subsequent paragraphs, we could not confirm that EDRS provides Web-based access with appropriate Internet security, and also could not confirm that EDRS is operational 24 hours a day, 7 days a week.

We requested a Web-based user access to test the security and the access mechanism to the system that normally would be used by funeral directors and medical facilities to confirm the Web-based access to EDRS and the Internet security features associated with said access.

DoHMH could not establish such an inquiry-only audit-user account for our testing of EDRS. The difficulty reportedly was due to EDRS's requirements that actual user identification information is necessary when establishing an account, such as specific funeral home or medical institution information as well as valid license information of the medical providers and funeral directors.

We agreed to perform alternative testing of EDRS through the access of an authorized DoHMH staff member, who performed query functions and generated EDRS management reports upon our request. We observed DoHMH employees[7] while they were accessing EDRS, observed a training session conducted by DoHMH staff for funeral directors who had online access to an EDRS test environment, and tested the online access using training user identification codes and passwords. However, this alternative testing, while useful, did not provide the same level of assurance as the tests that we would have conducted on the live application had we been able to obtain the requested inquiry-only audit-user account.

We also could not verify that EDRS was operational 24 hours a day, 7 days a week since DoHMH did not provide us with evidence to substantiate continuous operations. Also, as noted in the Findings and Recommendations section of this report, DoHMH was unable to substantiate EDRS performance with a system performance report.[8]

Our audit scope focused on performance results and issues related to the implementation of EDRS. Our fieldwork was conducted from October 2008 through April 2009. To achieve our objectives, we interviewed DoHMH officials; conducted a walk-through of the current

[7] Our choice to observe EDRS use by DoHMH employees who are fully trained and proficient in using EDRS removed the possibility of selecting and observing newly trained hospital staff or funeral directors who may not be as proficient in using EDRS and who therefore might cause data-entry errors or other system mishaps that could be misinterpreted as EDRS issues. In addition, evaluating the data captured within EDRS was far more valuable for our audit purposes than observing only the data-entry task. We evaluated EDRS data for accuracy and its sufficiency for DoHMH approval and issuance of death certificates and also observed data-entry by DoHMH employees.

[8] A System Performance Report (generic name) is produced by a specialized computer program, which automatically tabulates the operating statistics of any computer application—it logs the actual run time of a computer application, and would show the time periods when an application is down (not available) for any reason. It is generally administered and controlled centrally by the IT unit of an organization.

Registration Unit's operation; reviewed project specifications documents, project proposals, contracts, and EDRS-related information from DoHMH and publicly accessible sources. We also did the following:

- Reviewed the prior Comptroller's Office audit report, *Audit Report on the Development and Implementation of the Electronic Death Registration System by the Department of Health and Mental Hygiene*, 7A03-073, issued on June 23, 2003, to gain an overall understanding of the issues raised in the previous audit,

- Analyzed the Department of Information Technology and Telecommunications' (DoITT's) *Security Accreditation Documentation*[9] *DoHMH EVERS Application, DRAFT, version 0.1*, dated October 15, 2008, to gain an overall understanding of the process. EVERS (Electronic Vital Events Registry System) is the core, or main, application that contains the birth registration and the death registration modules of the system,

- Observed users signing onto the system, entering data, and navigating through electronic death registration forms; the output of information from the system, and the printing of forms and certificates, to assess EDRS's functional reliability, data-recording accuracy, information security, and access control,

- Observed data entry of paper-based death registrations and the printing of Certificates of Death to assess data reliability,

- Generated six types of the 47 available built-in standard reports from EDRS to evaluate the standard reporting function and to examine its output,

- Reviewed DoHMH's internally developed sampling reports, such as internal vital statistics reports (which show the number of death certificates processed using EDRS on a particular day, breaking out certificates filed manually, electronically, and partially electronically by doctors, by funeral directors, and by the Office of the City Medical Examiner) to obtain an indication of the number of electronically filed death cases in EDRS.

- Compared actual EDRS costs to its original estimates to evaluate whether EDRS development and implementation costs were within original estimates,

- Reviewed VitalChek's Web Tracker[10] reports to identify any open issues related to system performance after development,

- Examined project proposal and design documents to evaluate whether EDRS can accommodate future enhancements or upgrades,

[9] As part of New York City guidelines, computer applications, once developed, must undergo an accreditation process by DoITT's security division before the application can become operational.

[10] Web Tracker is an online tool developed by VitalChek Network, Inc., to manage EDRS change requests, to report defects for correction, to track work orders (for enhancements or upgrades to EDRS), and to track and manage work hours.

- Examined death-certificate-related comments received from the general public by DoHMH through its Web site and calls to the City's 311 system[11] for a five-week period (February 1 through March 7, 2009), to ascertain EDRS user satisfaction. This examination was also used to determine whether there were comments directly resulting from EDRS performance deficiencies or complaints about using the new system,

- Inspected Web Tracker to learn whether there were reported anomaly or support issues originating from user complaints,

- Examined user comments, complaints, and feedback received directly by Vital Records through the mail for additional indications of EDRS service performance quality,

- Attended an EDRS training session on April 6, 2009, conducted by DoHMH staff for funeral directors to evaluate the training content, observe funeral directors' reactions to EDRS, and view the functions associated with funeral directors' tasks when they use EDRS,

- Analyzed the DoHMH's disaster recovery and business continuity plan to evaluate the agency's scope and coverage provisions in the event of a disaster or a business interruption.

As criteria, we used the "Electronic Death Registration Standards and Guidelines," Version 2.0, Final Release, issued November 3, 2004, for understanding the basic requirements in implementing an EDRS—a national EDRS model, representing standards and guidelines for states to use in developing and implementing an electronic death registration system, the DoITT Security Architecture Standard, the DoITT Change Management Policy, and the New York City Comptroller's Internal Control and Accountability Directive #18, "Guidelines for the Management, Protection and Control of Agency Information and Information Processing Systems."

Discussion of Audit Results

The matters covered in this report were discussed with DoHMH officials during and at the conclusion of this audit. A preliminary draft report was sent to DoHMH officials and discussed at an exit conference held on September 30, 2009. On October 5, 2009, we submitted a draft report to DoHMH officials with a request for comments. We received a written response from DoHMH officials on October 20, 2009. In their response, DoHMH officials generally agreed with the five findings and recommendations regarding EDRS reporting and performance-monitoring issues that should be resolved to improve system usefulness, establishment of policies and procedures for handling future EDRS enhancements or upgrades, and proper tracking of all outstanding EDRS problems and their resolutions. The full text of the DoHMH response is included as an addendum to this report.

[11] The 311 system is New York City's telephone number for government information and non-emergency services.

FINDINGS AND RECOMMENDATIONS

EDRS functions reliably, and information recorded in the database is accurate and secure from unauthorized access. It is based on the national EDRS model, allows for future enhancements or upgrades, and was completed within original cost and time estimates.[12] It has a disaster recovery and business continuity plan in place. Users are generally satisfied with the system.

However, we concluded that there were reporting and performance-monitoring issues that should be resolved to improve system usefulness. In terms of reporting, we noted that the EDRS capability to generate ad-hoc reports needs improvement, and that existing EDRS standard reports have not been fully tested for elimination of errors. With regard to performance-monitoring, we noted that the system could not produce a systems performance report showing daily scheduled maintenance, unscheduled maintenance, and downtime. In the absence of a systems performance report, there is no assurance that DoHMH can determine actual EDRS availability so its staff can monitor system performance and address any problems with the application as they arise. Moreover, because of the lack of such a report, we also could not confirm that EDRS is operational 24 hours a day, 7 days a week. In addition, DoHMH needs to develop a policy and procedures for handling future EDRS enhancements or upgrades, and review all open items previously recorded in Web Tracker for problem resolution.

Finally, as noted in our Scope disclosure, our opinion is qualified in that we were unable to confirm that EDRS provides Web-based access with appropriate Internet security.

DoHMH Cannot Generate Ad-hoc Reports from EDRS

DoHMH is unable to generate system-wide statistical or managerial reports from EDRS. This impedes the ability of DoHMH to manage the electronic death registration process to ensure that it is operating as intended.

According to the Electronic Death Registration System Proposal Addendum, a result of a meeting held between DoHMH and VitalChek on March 28, 2001, the ad-hoc reporting capability task and its description was added without additional cost. As implemented, the ad-hoc reporting feature is limited in breadth and depth. EDRS's capacity to generate various types of reports is constricted and adversely affects system performance, which has a direct impact on users (discussed later in the report). A VitalChek document entitled "Analysis for the Death Registration Component of the Database Application for Vital Events Application," dated August 25, 2005, described the report printing feature as follows:

> Reports are different from electronic forms in that they can be generated ad-hoc by the application. Depending upon the report, the user may need to enter some criteria, the application server creates the report, and then it is presented to the

[12] The latest EDRS project had an original fixed cost of $1.3 million. It was to be completed within the two-year time frame of adoption of the national EDRS standards model (as prescribed by NAPHSIS in November 2004) by the vendor VitalChek.

user's browser. The user can view the report on the browser and may optionally print it.

However, in practice, without vendor support DoHMH cannot easily produce a usage report of all of its EDRS-enrolled medical facilities and funeral homes to measure the utilization rate of the system. To produce such a report would require either vendor support or the queuing and printing of all usage reports for each medical facility and funeral home individually for each specified time period, and then tallying all the reports manually to arrive at the combined utilization rate of EDRS.

The Number of Death Certificates Issued Could Not Be Determined

We were unable to determine the number of death certificates issued by EDRS since the initial electronic filing began on December 18, 2006. The inability to account for the number of filings was due to reporting deficiencies, which include the lack of reports establishing the number of enrolled EDRS users, the biometric authentication installation status of those enrolled, and the number of electronic death filings by enrolled users.

There were no reports available to measure the number of electronic death filings by any enrolled user, either at medical facilities or at funeral homes. Also, we were unable to determine the number of users enrolled to utilize EDRS as of March 31, 2009. An EDRS Implementation Plan, dated February 19, 2009, showed EDRS enrollment status as follows, on Table I, below:

Table I
EDRS Enrollments by User According to
February 19, 2009 EDRS Implementation Plan

EDRS External Users	
Medical Facilities enrolled in EDRS with Biometric Authentication	50
Medical Facilities enrolled in EDRS without Biometric Authentication	11
Funeral Homes enrolled in EDRS with Biometric Authentication	11
Funeral Homes enrolled in EDRS without Biometric Authentication	9
Total	81

DoHMH claims in other documents presented to us that 90 medical facilities are enrolled to use EDRS. However, due to the reporting limitations inherent in the system, DoHMH cannot verify the level of enrollment of medical facilities and funeral homes or the biometric authentication installation status of those it claimed were enrolled to use the system. In the interim, DoHMH has been monitoring the use of the system by selecting days for periodic sampling of death filings on those days.

Moreover, DoHMH claims that funeral homes are reluctant to sign up before the medical facilities because of the limited benefit they will derive. If the medical facilities are not enrolled in EDRS then the funeral homes will still have to utilize the paper process in order to obtain the necessary medical signatures on the death certification. During this transitional stage, DoHMH is accommodating the paper-based process within EDRS. The paper-based death registration process is being used when either the medical facility and/or the funeral home are not enrolled in EDRS.

A flexible EDRS reporting facility is important for management in helping to monitor daily processes, evaluate patterns of use for proper staffing coverage, planning future user capacity requirements, and for security purposes in tracking individual users. Without the ability and flexibility to produce periodic ad-hoc management reports, DoHMH is not able to efficiently monitor EDRS performance on a focused, timely, and accurate basis.

Recommendation

1. We recommend that DoHMH have the vendor correct the EDRS ad-hoc reports-generating capability to meet the required specifications.

DoHMH Response: "We agree with the auditors' assessment and since completion of the auditors' field work (April 2009), the vendor, VitalChek, has corrected the EDRS ad-hoc reports-generating capability to meet the required specification. To further enhance ad-hoc reporting, DoHMH trained its staff in the use of a report tool (LogiXML) in the spring of 2009 and will create management reports that could not be created at the time of the audit."

Standard EDRS Reports Have Deficiencies

During testing of EDRS standard (built-in) reports, we noted several report defects, which indicates a lack of data output controls, for example, reviewing reports, reconciliation of input to expected outputs, verifying dates, numerics, and codes, and distribution of reports.[13] Comptroller's Internal Control and Accountability Directive #18, §8.2 (4), states: "Data output controls help ensure the integrity of application outputs. These include output balancing and reconciliation, error handling, output distribution, and retention." Based on our tests of six types of EDRS standard reports, we observed that several reports contained irregularities as shown in Table II, below. According to DoHMH, the report anomalies shown on Table II are being addressed by the Department with the vendor.

[13] In information processing, output is any data exiting a computer system (or presented on a computer screen) after a computer process. The output could be printed on paper or recorded on magnetic media (such as a CD, DVD, tape, or disk).

Table II
Data Irregularities in Six Types of
EDRS Standard Reports

Report	Time Period Coverage	Anomaly Observed
Burial Desk Document Log[(a)]	December, 2008	Numerous blank data fields
Burial Desk Document Log	March, 2008	No results reported
Burial Desk Document Log	December, 2007	No results reported
Burial Desk Document Log	April, 2007	No results reported
Burial Desk Document Log	December, 2006	No results reported
Voided & Missing Records, Death	Year, 2008	None.[(b)] Eight voids
Death Registration Audit,[(c)] Bellevue Hospital Center	Year, 2008	Large number of "Unknown" in "Type of Disposition"[(d)]
Death Registration Audit, Jewish Home and Hospital Lifecare System	Year, 2008	Type of Disposition "Unknown," "State Average Filing Time" miscalculation[(e)]
New Users,[(f)] Sinai Chapels	Year, 2008	Missing office name & data

(a) Shows all orders entered between a selected beginning date/time and ending date/time for a specific office and is limited to the "burial desk" business unit.
(b) This report does not have an obvious error as tested—it is only listed as one of the six types we examined. Reporting voids is the intent of this report.
(c) This report lists all deaths registered between a selected beginning and ending date. The report is categorized by office type, i.e., hospital, nursing home, funeral home, etc.
(d) Type of Disposition could be "Burial," "Cremation," "City Cemetery," "Entombment," "Other," or "Unknown." This report showed a total disposition of 324; 1 in "Burial," 1 in "Cremation," and 322 in "Unknown."
(e) Report showed a total disposition of 5, all in Type of Disposition "Unknown." The State Average Filing Time showed 2.8 (days) calculated on the basis of a number reported on the row for Type of Disposition "Burial," which showed a number "0."
(f) All new users added to EDRS where the Create Date for the user stored within the Audit Log is between the defined beginning and ending date.

If this problem remains unresolved it would reduce the overall value of EDRS. Defective reports reduced DoHMH's ability to ensure the integrity of system outputs, diminishing the agency's capacity to perform record reconciliations.

Recommendation

2. We recommend DoHMH test all available EDRS standard reports produced by the system, request resolution of all reports where problems were noted, and test the reports after the problems have been addressed.

DoHMH Response: "DoHMH concurs with the auditors' recommendation and is already addressing this issue with the vendor. Recognizing that there are many standard (build-in) reports in the system, DoHMH prioritized implementation of a basic set of reports required to provide the EDRS functionality to the user community as early as possible. We reviewed and had the vendor correct those EDRS standard reports. DoHMH will systematically test all standard reports produced by the system. DoHMH will request VitalChek to correct all reports that have problems, and then test the reports after the problems have been addressed."

DoHMH Does Not Monitor System Performance

EDRS is an application designed for availability on a 24-hour-a-day, 7-day-a-week basis, serving the mission-critical function of registering deaths in New York City. Any unexpected system interruptions or disruptions should be recorded for investigation for troubleshooting and problem resolution. We requested a system performance report to substantiate the actual availability of EDRS for a one-year period starting April 1, 2008, and ending March 31, 2009. The DoHMH Central IT Division was unable to produce such a report because the logging facility had not been made available or activated.

DoITT's Network Management Directive §3.7, "Performance Monitoring, Tracking, and Reporting," states:

> Real-time monitoring of network performance is required to track performance against established standards and to form a baseline for capacity planning. City agencies must develop a process for network monitoring and problem reporting and resolution. Thresholds for acceptable network performance and availability must be established and compared with actual performance. Automated crisis communication warnings must be issued when possible to provide early warning of questionable network behavior.

A proper system-performance-reporting capability requires an appropriate system environment, system-monitoring tools, and the setting of the tools to report on service performance. Since the implementation of EDRS was completed in June 2008, it is imperative that DoHMH IT division begin monitoring of the application; thereby providing DoHMH with detailed records of actual EDRS availability so its staff can address any problems with the application as they arise.

Recommendation

3. We recommend that DoHMH institute or develop a proper system monitoring facility and set it to record EDRS service performance.

DoHMH Response: "We agree with the recommendation and recognize the importance of monitoring EDRS service performance. Since September, 2009, DoHMH has instituted a system that monitors the Electronic Vital Events Records System (EVERS) service performance, which incorporates EDRS service performance."

DoHMH Does Not Have a Policy or Procedures for Handling EDRS Enhancements or Upgrades

EDRS allows for future enhancements or upgrades. However, DoHMH does not have a formal policy and procedures for handling enhancements or upgrades. A policy should include the requirement for describing the necessary or desired enhancement or upgrade, procedures for estimating costs, requesting project approval, budgeting, implementation schedule, project implementation monitoring, completion testing, project signoff, and paying for satisfactorily

completed EDRS enhancements or upgrades. The lack of a formal policy and procedures risks failure to provide assurance that appropriate and authorized changes are made to EDRS.

Comptroller's Internal Control and Accountability Directive #18, §9.3, prescribes a guideline for "Applications Software and System Software Change Control," stating:

> A change control policy is necessary to insure that only appropriate, authorized changes are made to application and system software. Changes can range from the rectification of minor bugs to module replacements and major enhancements. Major changes should be undertaken with great care. They involve considerable time, effort and agency resources, and could adversely impact existing systems. Periodic reports describing the changes underway and the progress toward implementation should be provided to executive management.

In addition, DoITT's Change Management Policy, states: "All Changes to City of New York Systems are required to follow defined change management processes to ensure the mitigation of risks and minimize disruption to critical services."

As of April 9, 2009, 48 work orders (representing EDRS enhancements or upgrades) were entered into Web Tracker (see: Work Orders Recorded in Web Tracker in Appendix). This magnitude of work orders with an "Open" status, some dated as far back as 2005, without notation of the amount of work or the time to complete the task, clearly shows a need for a policy and set of procedures for handling EDRS enhancements or upgrades. As a consequence, DoHMH does not have the assurance that only appropriate and authorized enhancements or upgrades (projects) are made to EDRS, approved projects are being developed within a specific timeframe and finished projects will be tested prior to placement into production, and only satisfactorily completed and fully tested enhancements or upgrades are approved for payment.

Recommendation

4. We recommend that DoHMH develop a policy and procedures for handling EDRS enhancements or upgrades.

DoHMH Response: "We agree with this recommendation and we are in the process of formalizing in writing our policy and procedures for handling EDRS enhancements or upgrades. While we have always had strong internal control procedures a written set of policy and procedures will further enhance management of EDRS changes."

DoHMH Does Not Ensure That Problems Reported on VitalChek Web Tracker Are Resolved

DoHMH has not ensured that its requested changes to EDRS have been addressed, or if they have been addressed, DoHMH is not tracking the status of the resolution in Web Tracker.

Changes to EDRS requested by DoHMH are communicated electronically online to the vendor's change-management system, Web Tracker, and may include problem resolutions and

fixes, and enhancements or upgrades. Modifications may also occur resulting from support requests. Web Tracker is a tool developed by VitalChek Network, Inc., to manage change requests, to report defects for correction, to record work orders (for enhancements or upgrades to EDRS), and to track and manage work hours. Once a Web Tracker issue is logged for a defect, an enhancement or upgrade, or a general task (such as a support request), the communication begins by assigning the issue to a specific staff member for resolution. From that point, each person involved in the particular issue adds progress comments and logs the amount of time spent on the task.

DoITT's Change Management Policy states: "The change management process and procedures must be formally documented. All changes must: . . . c) Be tested in advance as thoroughly and reasonably possible; d) Be assessed for impact, risk and priority; . . . f) Must be submitted and routed through the defined process steps in the change control process."

We obtained Web Tracker records on April 9, 2009, which included a total of 313 entries containing records from the initial entry on January 14, 2005, to the last entries on April 9, 2009. However, Web Tracker provides a data field ("Closed On") that indicates the date an issue is closed. We found that this column was not used, which (administratively) means all recorded issues are open. Web Tracker also has a "Status" field used to show the current status of an issue. There are several terms used in the status field to describe the status of an issue.

However, as of April 9, 2009, none of the 313 issues were recognized as "Closed." To close an issue, it must pass customer user acceptance testing—this means that none of the 170 "Client REL" issues,[14] though considered resolved by VitalChek, were tested or documented as having been tested by DoHMH. The condition as described indicates that DoHMH is actively reporting anomalies and other issues in Web Tracker, but is not sufficiently monitoring progress and verifying that issues have been corrected or alleviated.

One example concerned the report, "Burial desk document log not populating fields and all transactions correctly." This report's problems, which were initially reported on April 16, 2008, was released with a status of "Client REL" on July 17, 2008, to the customer site for user acceptance tests. However, this issue appears without further action in the Web Tracker system on April 9, 2009. A defective report reduces DoHMH's ability to ensure that all problems have been resolved, thus diminishing the department's ability to perform record reconciliations. (The following, Table III, includes a summary of the 313 issues recorded in Web Tracker and their status as of April 9, 2009.)

[14] Client REL means that a specific issue has been released to customer site for the customer to perform user acceptance tests.

Table III
Issues Recorded in Web Tracker and Their Status
As of April 9, 2009

Count	Status	Definition [(a)]
7	Analysis	Analysis in progress
2	BA Review	
170	Client REL	Issue has been released to customer site for the customer to perform user acceptance tests (UAT)
0	Closed	Issue passed customer UAT
2	Deferred	Issue being held for future release or work
2	DEV Complete	Development complete, ready to test
5	Development	Issue is being worked on by a developer
44	New	The default value for a newly entered issue
45	Open	Defect has been validated, waiting for attention from Project Manager
1	QA	Quality Assurance tests in progress
2	QA Blocked	
27	QA Complete	Quality Assurance tests complete, ready for release
3	Rejected	Issue has been rejected (for lack of information, training issue, etc.)
3	Reopened	Issue failed Quality Assurance or customer UAT and has been reopened
0	Ready to Merge	Developer's work is complete, waiting for code merge and/or build
313		**Total**

(a) "BA Review" and "QA Blocked" were not found in the Web Tracker User Guide, revision date February 23, 2009, and we do not know what the terms represent.

Recommendation

5. We recommend that DOHMH review the status of all issues reported in Web Tracker, and where appropriate, close the reported issues and institute a stricter monitoring and periodic updating procedure for all those issues.

DoHMH Response: "We agree with the recommendation and have worked with VitalChek to make Web Tracker, an online tool to manage EDRS change requests, more useful. Thus, we will review the status of all issues reported in Web Tracker and, where appropriate, close the reported issues and institute a stricter monitoring and periodic updating procedure for all those issues."

Appendix

Work Orders Recorded in Web Tracker as of April 9, 2009

Priority	Id	Type	Status	Created On	Due By	Closed On	Description:
Priority 3	30842	Estimate	Open	1/14/2005			WO 20 - Capitalize first letter…
Priority 3	32401	Estimate	Open	5/12/2005			WO 21 Add check amounts…
Priority 2	33747	Estimate	Open	8/9/2005			WO 22 - Add an order…
Priority 1	37159	Estimate	Open	3/14/2006			WO 23 - Decedent Last name…
Priority 2	38548	Estimate	Open	6/9/2006			WO 1 - Add column to…
Priority 2	38560	Estimate	Open	6/9/2006			WO 12 - if marital status…
Priority 2	38562	Estimate	Open	6/9/2006			WO 14 - Add ability to…
Priority 2	38563	Estimate	Open	6/9/2006			WO 16 - Add time filed…
Priority 2	38564	Estimate	Open	6/9/2006			wo 17 - Add new business…
Priority 2	38565	Estimate	Open	6/9/2006			wo 18 - Trade Call Enhancements
Priority 2	38552	Estimate	Open	6/9/2006			WO 4 - New business function…
Priority 2	38553	Estimate	Open	6/9/2006			WO 5 - Add prompt for…
Priority 2	38554	Estimate	Open	6/9/2006			wo 6 - Provide ability for…
Priority 2	38555	Estimate	Open	6/9/2006			WO 7 - new business function…
Priority 2	38556	Estimate	Open	6/9/2006			WO 8 - Add New edit…
Priority 2	38954	Estimate	Open	7/2/2006			WO 28 - Add Middle Name…
Priority 2	38956	Estimate	New	7/2/2006			WO 29 - disable number paper…
Priority 2	39682	Enhancement	Client REL	8/24/2006	1/19/2007		WO 33 - Add intern/resident…
Priority 2	39685	Enhancement	Deferred	8/25/2006			WO 34 - Updateable image of …
Priority 2	39750	Estimate	New	9/5/2006	11/7/2007		WO 19 - Allow funeral homes…
Priority 2	40162	Estimate	New	9/26/2006			WO 35 - Add new edit…
Priority 2	40213	Estimate	New	9/28/2006			WO 15 -Allow hyphens in…
Priority 2	40848	Estimate	New	10/29/2006	12/11/2006		WO 38 Allow cremation clearance…

Priority 2	40849	Estimate	New	10/29/2006	12/11/2006	WO 39 Provide ability to…
Priority 2	40853	Estimate	New	10/29/2006	12/11/2006	WO 42 change DR0055…
Priority 2	40851	Estimate	New	10/29/2006	12/11/2006	WO 43 Add are you…
Priority 2	40865	Estimate	New	10/29/2006	12/11/2006	WO 45 add a visual…
Priority 2	40862	Estimate	New	10/29/2006	12/11/2006	WO 46 Allow medicial facility…
Priority 2	40854	Estimate	New	10/29/2006	12/11/2006	wo 48 Amendment page changes
Priority 2	40861	Estimate	New	10/29/2006	12/11/2006	WO 49 Add amendment updated …
Priority 2	40860	Estimate	New	10/29/2006	12/11/2006	WO 50 Add business function…
Priority 2	40859	Estimate	Open	10/29/2006		WO 51 Change items that…
Priority 2	40858	Estimate	New	10/29/2006	12/11/2006	WO 52 Between each page…
Priority 2	40856	Estimate	New	10/29/2006	12/11/2006	WO 54 Recall GIS interface…
Priority 2	41051	Estimate	New	11/9/2006		WO 60 - OCME changes for…
Priority 2	41662	Estimate	New	1/30/2007		WO 56 Filter administrative error…
Priority 2	42956	Estimate	New	5/14/2007		wo 62 Payments Page Wording
Priority 2	46021	Enhancement	Client REL	3/28/2008		WO 71 - Death Interstate Exchange…
Priority 0	47290	Enhancement	Client REL	8/28/2008		wo 66 issue date and…
Priority 1	47289	Enhancement	Client REL	8/28/2008		WO66-Add issue date to…
Priority 2	47503	Enhancement	Client REL	9/25/2008		WO 66 Att D updates
Priority 2	47502	Enhancement	Client REL	9/25/2008		WO66 Att C updates…
Priority 2	47501	Enhancement	Client REL	9/25/2008		WO66 Att S updates
Priority 2	47506	Enhancement	Client REL	9/26/2008		wo 66 Vault and certified…
Priority 2	48466	Enhancement	ReOpen	2/6/2009		WO 79 Print System Case…
Priority 1	48552	Enhancement	Open	2/20/2009		WO 80 - Add time and…
Priority 2	48551	Enhancement	Analysis	2/20/2009		WO 81 Provide an ability…
Priority 2	48558	Enhancement	Client REL	2/23/2009		WO 78 - Missing First Name…

NEW YORK CITY DEPARTMENT OF
HEALTH AND MENTAL HYGIENE
Thomas Farley, MD, MPH
Commissioner

October 20, 2009

John Graham, Deputy Comptroller
Audits, Accountancy & Contracts
Office of the Comptroller
1 Centre Street
New York, NY 10007-2341

Re: Audit Report on the Implementation of the
Electronic Death Registration System by the
Department of Health and Mental Hygiene
7A09-083

Dear Mr. Graham:

We have reviewed the draft Audit Report on the Implementation of the Electronic Death Registration System (EDRS) by the Department of Health and Mental Hygiene (7A09-083). The purpose of the audit was to determine whether a) EDRS functions reliably and information recorded in the database is accurate and secure from unauthorized access, b) the system design allows for future enhancements or upgrades, c) EDRS has been built within the anticipated cost estimate, d) users are satisfied with the system and e) a disaster recovery plan has been devised for EDRS and it has been incorporated into the DOHMH disaster recovery plan.

We are pleased with the auditors' assessment that:

- EDRS functions reliably, and information recorded in the database is accurate.
- Information recorded in the EDRS database is secure from unauthorized access.
- The system is based on the national EDRS model and allows for future enhancements or upgrades.
- EDRS was completed within original cost and time estimates.
- EDRS has a disaster recovery and business continuity plan in place.
- Users are generally satisfied with the system.

The auditors noted reporting and performance-monitoring issues that should be resolved to improve system usefulness. These issues are in the areas of ad-hoc reporting, performance monitoring, policies and procedures for future EDRS enhancements, and the proper tracking of outstanding problems and their resolutions.

The auditors made five recommendations with which we generally agree. The following is a summary of progress made relevant to the audit recommendations:

- EDRS' ad-hoc report generating capabilities was improved and DOHMH enhanced its ability to generate ad-hoc reports by using third party reporting software (LogiXML). (Recommendation 1)

- The vendor improved priority standard built-in EDRS reports and DOHMH is in the process of systematically testing all EDRS standard reports to identify those that still require corrective actions. (Recommendation 2)
- DOHMH is already electronically monitoring EDRS' server performance and generates a monthly report on EDRS performance. (Recommendation 3)
- DOHMH is in the process of formalizing the policy and procedures to address future EDRS enhancements and changes. (Recommendation 4)
- DOHMH has worked with the vendor to improve the usefulness of Web Tracker, an online tool to manage EDRS change requests. We will review the status of all issues reported in Web Tracker and address the reported issues. (Recommendation 5)

The attached details DOHMH's progress and highlights future activities.

We appreciate the courtesy and professionalism of your staff in the performance of this audit and in the pre-exit conference. We look forward to working with you further in the future.

If you have any questions of require any further information, please contact Thomas Hardiman, Director, Internal and External Audits, at (212) 219-5044.

Sincerely,

Lorna Thorpe, PhD
Deputy Commissioner

Attachment
Cc: Thomas Farley, MD, MPH
Andrew Rein
Elizabeth Begier, MD, MPH
Sara Packman

DOHMH Response to the Draft Audit Report On the Implementation of the Electronic Death Registration System By the Department of Health and Mental Hygiene

7A09-083

October 20, 2009

We have reviewed the draft Audit Report on the Implementation of the Electronic Death Registration System (EDRS) by the Department of Health and Mental Hygiene (7A09-083). The purpose of the audit was to determine whether EDRS functions reliably and information recorded in the database is accurate and secure from unauthorized access; the system design allows for future enhancements or upgrades; EDRS has been built within the anticipated cost estimate and that a disaster recovery plan has been devised for EDRS and has been incorporated into the DOHMH disaster recovery plan. The audit scope included determining whether users are satisfied with the system.

We are pleased that the auditors found that:

- EDRS functions reliably, and information recorded in the database is accurate.
- Information recorded in the EDRS database is secure from unauthorized access.
- The system is based on the national EDRS model and allows for future enhancements or upgrades.
- EDRS was completed within original cost and time estimates.
- EDRS has a disaster recovery and business continuity plan in place.
- Users are generally satisfied with the system.

We generally concur with the auditors' observations and recommendations and will highlight our progress since the completion of audit field work (April 2009) and our future plan in the sections that follow.

Findings and Recommendations:

Finding: *DOHMH cannot generate ad-hoc reports from EDRS*

Recommendation 1:
The auditors recommend that *"DoHMH have the vendor correct the EDRS ad-hoc reports-generating capability to meet the required specification."*

DOHMH Response:
We agree with the auditors' assessment and since completion of the auditors' field work (April 2009), the vendor, VitalChek, has corrected the EDRS ad-hoc reports-generating capability to meet the required specification. To further enhance ad-hoc reporting, DOHMH trained its staff in the use of a report tool (LogiXML) in the spring of 2009 and will create management reports that could not be created at the time of the audit.

Finding: *Standard EDRS reports have deficiencies*

Recommendation 2:
The auditors recommend that *"DoHMH test all available EDRS standard reports produced by the system, request resolution of all reports where problems were noted, and test the reports after the problems have been addressed."*

DOHMH Response:
DOHMH concurs with the auditors' recommendation and is already addressing this issue with the vendor. Recognizing that there are many standard (built-in) reports in the system, DOHMH prioritized implementation of a basic set of reports required to provide the EDRS functionality to the user community as early as possible. We reviewed and had the vendor correct those EDRS standard reports. DOHMH will systematically test all standard reports produced by the system. DOHMH will request VitalChek to correct all reports that have problems, and then test the reports after the problems have been addressed.

Finding: *DOHMH does not monitor system performance*

Recommendation 3:
The auditors recommend that *"DoHMH institute or develop a proper system monitoring facility and set it to record EDRS service performance."*

DOHMH Response:
We agree with the recommendation and recognize the importance of monitoring EDRS service performance.

Since September, 2009, DOHMH has instituted a system that monitors the Electronic Vital Events Records System (EVERS) service performance, which incorporates EDRS service performance. DOHMH currently provides monthly reports of availability ("uptime") of all hardware components between the user and the software, including infrastructure and hosting platform environment. The reports also include monitoring results of EVERS web servers, application servers, and the database server.

As stated in the audit report, EDRS is used for the burial desk which operates 24 hours-a-day, 7 days-a-week. As a result, system availability and performance is monitored by the staff of DOHMH's burial desk, who continuously use the system.

Finding: *DOHMH does not have a policy or procedures for handling EDRS enhancements or upgrades*

Recommendation 4:
The auditors recommend that "*DoHMH develop a policy and procedures for handling EDRS enhancements or upgrades."*

DOHMH Response:
We agree with this recommendation and we are in the process of formalizing in writing our policy and procedures for handling EDRS enhancements or upgrades. While we have always had strong internal control procedures a written set of policy and procedures will further enhance management of EDRS changes. Current control procedures for requesting and approving changes include:

- Work orders, including no-cost work orders, follow internal policies and procedures which require review and approval by both the EDRS Program Manager and Assistant Commissioner before the vendor is requested to implement it.
- Changes are first tested by the vendor and then are installed on a DOHMH test server and tested by DOHMH for several weeks. Only then, are they moved into production.
- The 48 work orders in Web Tracker, which are cited in the audit report, are items DOHMH had asked the vendor to evaluate for a specific potential modification to the system. A number of these work orders have actually been fulfilled by the vendor in the course of system upgrades and maintenance; others are placeholders for future consideration. They are not requests to make changes and thus are not "Open" work orders. As addressed in our response to Recommendation 5 below, we will have the vendor change the status of these items where appropriate.

Finding: *DOHMH does not ensure that problems reported on VitalChek Web Tracker are resolved.*

Recommendation 5:
The auditors recommend that *"DoHMH review the status of all issues reported in Web Tracker, and where appropriate, close the reported issues and institute a stricter monitoring and periodic updating procedure for all those issues."*

DOHMH Response:
We agree with the recommendation and have worked with VitalChek to make Web Tracker, an online tool to manage EDRS change requests, more useful. Thus, we will review the status of all issues reported in Web Tracker and, where appropriate, close the reported issues and institute a stricter monitoring and periodic updating procedure for all those issues.