CITY OF NEW YORK
OFFICE OF THE COMPTROLLER

John C. Liu
COMPTROLLER

MANAGEMENT AUDIT

Tina Kim
Deputy Comptroller for Audit

Audit Report on the New York City Fire Department's Performance Indicators as Reported in the Mayor's Management Report

MH10-139A

October 19, 2011

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

John C. Liu
COMPTROLLER

October 19, 2011

To the Residents of the City of New York:

My office has audited the adequacy of the New York City Fire Department's (FDNY's) controls to ensure its performance indicators reported in the Mayor's Management Report (MMR) are accurate and reliable. We audit city entities such as this as a means of ensuring the accuracy and transparency of agency-reported information.

The audit found that, regarding the four critical indicators we reviewed on response times, FDNY's controls are adequate to ensure that its performance indicators as reported in the MMR are accurate and reliable. However, due to a policy change that occurred in May 2009, the time it took the FDNY Alarm Receipt Dispatchers to process calls, which are now handled by the New York City Police Department's Unified Call Takers, is no longer included in the fire response time calculations. As a result, starting in the Fiscal Year 2010 MMR—the first full fiscal year affected by this policy change—the fire response time statistics for two of the four critical indicators reviewed in this audit are no longer comparable to prior years' statistics. The audit also found some system access weaknesses regarding the FDNY's STARFIRE and Emergency Medical Service (EMS) Computer Aided Dispatch (CAD) systems. Finally, the audit found that FDNY does not have written disaster recovery plans specifically for the STARFIRE CAD system or the data warehouse containing the data downloaded from both CAD systems.

The audit made five recommendations including that the FDNY should make response time statistics comparable to prior years, install user identification and passwords for all personnel with access to the STARFIRE CAD system, ensure that the access of terminated employees or those on extended leave is removed from the EMS CAD system, and develop written disaster recovery plans for the STARFIRE CAD system and its data warehouse.

The results of the audit have been discussed with FDNY officials, and their comments have been considered in preparing this report. Their complete written response is attached to this report.

If you have any questions concerning this report, please e-mail my audit bureau at audit@Comptroller.nyc.gov.

Sincerely,

John C. Liu

Table of Contents

The City of New York
Office of the Comptroller
Management Audit

Audit Report on the New York City Fire Department's Performance Indicators as Reported in the Mayor's Management Report

MH10-139A

AUDIT REPORT IN BRIEF

Our audit objective was to determine whether the New York City Fire Department's (FDNY) controls are adequate to ensure that its performance indicators as reported in the Mayor's Management Report are accurate and reliable. This audit concentrated on the following four critical indicators: 1) average response time to structural fires; 2) average response time to structural fires and medical emergencies by fire unit; 3) average response time to life-threatening medical emergencies by ambulance unit; and 4) combined response time to life-threatening medical emergencies by ambulance and fire units.

The Mayor's Management Report (MMR) serves as a public report card on City services affecting the lives of New Yorkers and mainly covers the operations of City agencies reporting directly to the Mayor. FDNY responds to fires, public safety and medical emergencies, natural disasters, and terrorist acts to protect lives and property in the City. As reported in the MMR, the FDNY's Key Public Service Areas include protecting lives and property from fire hazards and other emergency conditions and providing quick and efficient responses to medical emergencies.

Audit Findings and Conclusions

Overall, we found that the FDNY's controls are adequate to ensure that its performance indicators as reported in the MMR, regarding the four critical indicators we reviewed on response times, are accurate and reliable. However, due to a policy change that occurred in May 2009, the time it took the FDNY Alarm Receipt Dispatchers (ARDs) to process calls, which are now handled by the New York City Police Department's (NYPD) Unified Call Takers (UCTs), is no longer included in the fire response time calculations. As a result, starting in the Fiscal Year 2010 MMR—the first full fiscal year affected by this policy change—the fire response time statistics for two of the four critical indicators reviewed in this audit are no longer comparable to the response time statistics reported for prior years.

In addition, we found that the STARFIRE Computer Aided Dispatch (CAD) system does not require individual user identifications or passwords to access the system, except for the maintenance personnel who have the ability to modify data. While the Emergency Medical

Service (EMS) CAD system does require individual user identifications and passwords, FDNY did not disable the accounts for some of its users who are on extended leave or no longer employed by the FDNY. The agency also assigned multiple EMS CAD system user identifications to the same individual. Finally, we found that FDNY does not have written disaster recovery plans specifically for the STARFIRE CAD system or the data warehouse containing the data downloaded from both CAD systems.

Audit Recommendations

Based on our findings, we make the following five recommendations, which are listed below. FDNY should:

- Determine the average processing time that was eliminated with the implementation of the UCT procedures and adjust either the prior years' response times or the current year's response times to make them comparable to one another. If FDNY is unable to make these calculations, it should separately report the response time statistics using the pre- and post-UCT implementation methods.

- Install user identifications and passwords for its non-maintenance personnel of the STARFIRE CAD system.

- Ensure that access of employees whose services are terminated or on extended leave be removed from the EMS CAD system.

- Periodically review the EMS CAD system users who have multiple user identifications to ensure that only individuals who currently need multiple user identifications have them.

- Develop written disaster recovery plans for the STARFIRE CAD system and its data warehouse.

Agency Response

In their response, FDNY officials stated that they agreed with four of the audit's five recommendations. They disagreed with our recommendation that the FDNY account for the implementation of the UCT procedures in its reporting of average response times.

INTRODUCTION

Background

As mandated by Chapter 1, §12 of the New York City Charter, the Mayor reports to the public and the City Council on the performance of City agencies in delivering services. The MMR serves as a public report card on City services affecting the lives of New Yorkers and mainly covers the operations of City agencies reporting directly to the Mayor. While not all agency activities are included, those that have a direct impact on residents are addressed. These activities are identified as "Key Public Service Areas" for each agency, and the "Critical Objectives" indicates the steps the agencies are taking to pursue their goals and deliver services. Key service areas and critical objectives are developed by each agency in collaboration with the Mayor's Office of Operations.

FDNY responds to fires, public safety and medical emergencies, natural disasters, and terrorist acts to protect lives and property in the City. As reported in the MMR, the FDNY's Key Public Service Areas include protecting lives and property from fire hazards and other emergency conditions and providing quick and efficient responses to medical emergencies. Among its critical objectives, the FDNY is to ensure prompt response time to fire, medical, and other non-fire related emergencies. To report on how well the FDNY is progressing in achieving its critical objectives and key service goals, the MMR includes 17 performance indicators, of which eight are identified as critical to agency performance.

The FDNY maintains two separate computer systems to record, dispatch, and track fire and medical emergencies – the STARFIRE and EMS CAD systems. The data compiled by the two CAD systems are used to generate the indicators that are the focus of this audit.

Because the FDNY responds to more than 260,000 fire and non-fire related emergencies and more than one million medical emergencies each year, transparency and accountability are essential in providing efficient and reliable delivery of services and in measuring its performance in carrying out its mission. Therefore, it is necessary that the FDNY provides relevant, accurate, and reliable performance indicators to elected officials, the public, and other interested parties for decision-making and accountability.

Objective

Our audit objective was to determine whether the FDNY's controls are adequate to ensure that its performance indicators as reported in the Mayor's Management Report are accurate and reliable.

This audit concentrated on the following four critical indicators: 1) average response time to structural fires; 2) average response time to structural fires and medical emergencies by fire unit; 3) average response time to life-threatening medical emergencies by ambulance unit; and 4) combined response time to life-threatening medical emergencies by ambulance and fire units.

Scope and Methodology Statement

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 objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. 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.

The scope period of this audit was July 2008 through October 2010. Please refer to the Detailed Scope and Methodology at the end of this report for the specific procedures and tests that were conducted.

Discussion of Audit Results

The matters covered in this report were discussed with FDNY officials during and at the conclusion of this audit. A preliminary draft report was sent to FDNY officials and discussed at an exit conference held on July 20, 2011. On July 22, 2011, we submitted this draft report to FDNY officials with a request for comments. We received a written response from FDNY officials on August 5, 2011. In their response, FDNY officials stated that they agreed with four of the audit's five recommendations. They disagreed with our recommendation that the FDNY account for the implementation of the UCT procedures in its reporting of average response times.

The full text of the FDNY response is included as an addendum to this report.

FINDINGS AND RECOMMENDATIONS

Overall, we found that the FDNY's controls are adequate to ensure that its performance indicators, as reported in the MMR regarding the four critical indicators we reviewed on response times, are accurate and reliable. In addition, we are reasonably assured that the computer program codes were written to perform the intended tasks and were structured to execute the calculations used for the MMR. However, due to a policy change that occurred in May 2009, the time it took the FDNY ARDs to process calls, which are now handled by the NYPD's UCTs, is no longer included in the fire response time calculations. As a result, starting in the Fiscal Year 2010 MMR—the first full fiscal year affected by this policy change—the fire response time statistics for two of the four critical indicators reviewed in this audit are no longer comparable to the response time statistics reported for prior years.

In addition, we found some weaknesses which should be addressed, even though they do not appear to have directly compromised the accuracy and reliability of the performance indicators. Some of these weaknesses include:

- The STARFIRE CAD system does not require individual user identifications or passwords to access the system, except for the maintenance personnel who have the ability to modify data. This weakness could allow unauthorized users to access the system and dispatch emergency vehicles to non-emergency sites.

- The FDNY did not disable the accounts for some of its EMS CAD system users who are on extended leave or no longer employed by the FDNY. The agency also assigned multiple EMS CAD system user identifications to the same individual. These weaknesses could allow unauthorized users to access the system and dispatch emergency vehicles to non-emergency sites.

- The FDNY does not have written disaster recovery plans specifically for the STARFIRE CAD system or the data warehouse containing the data downloaded from both CAD systems. This could negatively affect FDNY's ability to quickly recover from any disaster affecting the operation of the system.

Finally, in our survey of other municipalities, we found no consensus regarding the types of response time indicators reported.

These matters are discussed in greater detail below.

Controls are Adequate to Ensure Critical Performance Indicator Data is Reliable

Overall, we found that the four FDNY critical performance indicators that we reviewed are reliable and accurate. We also found the FDNY's controls to be adequate to ensure that the input, processing, and extraction of data used to generate the critical performance indicators as reported in the MMR are accurate and reliable.

Comptroller's Directive #18, *Guidelines for the Management, Protection and Control of Agency Information and Information Processing Systems*, identifies controls that can be employed to help ensure that transactions are authorized and data file integrity is preserved during the *data origination*, *input*, *processing*, and *output* processes. Ultimately, these controls should be designed to ensure that data is accurate, complete, and timely; should stem from approved sources; and should have *backup* and *recovery* controls to mitigate any systems failures or processing disruptions that may occur.

As stated previously, the data recorded in the STARFIRE and EMS CAD systems are used to generate the four indicators reviewed. The raw data for each incident type (fire and medical emergencies) is downloaded into a database called the *data warehouse*. The data warehouse is an ORACLE database that stores the incident data downloaded from the CAD systems and contains programming software that generates reports designed by the FDNY to serve its management needs. These reports—such as the *Fire Borough Activity Report* (for fire incidents) and *EMS Response Time Report* (for medical incidents)—contain summary information regarding incidents and response time data by incident type and borough. The response times are calculated by computer programs that have been set up to perform these calculations; the data processing and extraction functions are mostly automated; and the time recorded for each incident response by emergency personnel is based on the CAD systems' internal clocks and not recorded by the individuals involved in the processes.

The reports are generated automatically within the data warehouse on a daily, monthly, yearly, or other periodic basis as determined by the FDNY. The Management Indicator Reporting System (MIRS) accesses these reports created by means of the data warehouse and saves them as read-only PDF files. Personnel from the FDNY's Management Analysis and Planning (MAP) Unit print these computer-generated reports using MIRS and manually enter the response time data into Performance Management Application (PMA)—a system maintained by the Mayor's Office of Operations. After all performance indicators are entered into the PMA schedule, the information is reviewed by a MAP Unit supervisor before being electronically sent to the Mayor's Office via PMA to be included in the MMR. (For a summary flowchart of the process described here, see Appendix A).

With the exception of some minor system anomalies that we uncovered with the STARFIRE CAD system, which we discuss in further detail below, we found the data contained in both CAD systems to be reliable and accurate. We matched the response times reported in the Fiscal Year 2009 MMR to the response time figures shown in the reports and found no discrepancies. In addition, we found that the FDNY had adequate controls over data input, extraction, and calculation processes. The Comptroller's IT Audit Unit reviewed the programs

used by the FDNY to generate the response time reports and were reasonably assured that the programs were structured to perform the calculations they were intended to perform.

We also determined that there was adequate segregation of duties among those individuals who enter data into the CADs (e.g., dispatchers), those who compile the data (e.g., programmers), and those who report the data (e.g., MAP staff). Therefore, the FDNY has controls in place to ensure that no one individual controls all key aspects of the compiling, processing, and reporting of the four critical response times indicators. We also found that the data resources are adequately safeguarded.

Minor Discrepancy from the Source Data

To attain reasonable assurance of the accuracy of average response times reported in the MMR, we tested a five-day period in June 2009 to see if we would reach the same calculation as the daily reports generated for that same period by using the response time data stored in the data warehouse. We found all four critical indicators we reviewed were calculated correctly for the five days. However, we did find that of the 13,563 instances that were downloaded from the STARFIRE CAD system, 53 (0.39 percent) of them—all occurring within two days—did not properly download. When we brought this to the attention of the FDNY officials, they were able to provide us with data on these 53 instances, and all were found to be inquiries/complaints and not part of any of the four indicators we reviewed. Updates to the STARFIRE CAD system resulted in some of the incidents not being sent through the link to the data warehouse. This issue was corrected in August 2010.

When we performed a larger test for the entire month of August 2010, we found that only eight (0.01 percent) of the 85,935 instances were not properly downloaded. The FDNY officials stated that during high call volume (such as severe storms in New York City), they had problems with the STARFIRE incident tables. They said that they had corrected this issue on September 22, 2010.

Response Times to Structural Fires Indicators Are Not Comparable from Year to Year

In May 2009, the City instituted a policy change to unify fire emergency call-taking among the Police and Fire Departments. Under this new process, UCTs of the NYPD now carry out a portion of the call-taking process that was previously handled by the FDNY's ARD for most fire incidents.[1] As a result, that interval of time is no longer included in the response time statistics. Starting in the Fiscal Year 2010 MMR—the first full fiscal year affected by this policy change—the fire response time statistics are no longer comparable to the prior year's response time statistics since the call times previously processed by the FDNY ARDs are no longer included in the calculation for two of the four critical indicators we reviewed on response time.

Before UCT, the response time "clock" in the STARFIRE CAD system (the start time when response time was calculated) would begin when the FDNY ARD activated an alarm

[1] The UCT process was implemented only for fire-related emergencies. Medical emergencies were not affected by this procedural change.

screen on their terminal, on which he/she would enter all of the information related to the incident. Accordingly, the time it took for the FDNY ARD to process the call was counted in the FDNY's statistics of the overall response time to a fire or a fire-related emergency.

With UCT, a 911 NYPD Dispatcher (PCT) might be on the call receiving preliminary information from the caller for a period of time (e.g., two minutes) before releasing the incident to the FDNY ARD. (At the exit conference, FDNY officials stated that this time has never been tracked by FDNY before or after the implementation of UCT and, therefore, they do not know how much time elapses before the PCT releases the incident to the FDNY ARD.) It is at this transfer point that the "clock" would start recording the response time in the STARFIRE CAD, which is still when the call is received by the FDNY ARD. However, the time it took for the PCT call taker to process the call, which had previously been processed by the FDNY ARD call taker, is not included in the response time calculation.[2]

Although the implementation of UCT and the change in the call-taking process is disclosed in the narrative of the MMR for Fiscal Years 2009 and 2010 and its general impact on the processing time is reported in the narrative, there is no clear indication given in the fire response time statistics acknowledging that the decrease in the response time could—in whole or in part—be the result of this change. For example, where the fire response time indicators are reported, there is no specific notation indicating that the figures reported are not comparable from year to year, especially in the Fiscal Year 2010 MMR fire response time that are shown. It is during this year that the full impact of the reduction in response time due to the UCT call-taking procedural change would have taken place. In fact, the prior years' response times are reported side by side with the current year's figures as if they are comparable, with no indication shown that the reduction in response time reported from Fiscal Years 2009 to 2010 might have been the result of the implementation of UCT. We were unable to determine the extent to which this change affected the statistics and the FDNY, when asked, could not provide us with an estimate of the FDNY ARD processing time that is no longer captured. This lack of comparability could mislead a reader into believing that the reduction in average response time for structural fire emergencies was completely the result of increased performance of the fire emergency personnel rather than from the fact that a portion of the call-taking processing time that was spent by the FDNY ARD is no longer captured in the response time indicators reported in the MMR.

According to Governmental Accounting Standards Board's (GASB) Concept Statements No. 2 and No. 5, and *Suggested Guidelines for Voluntary Reporting SEA Performance Information*, SEA performance information should "faithfully represent what it purports to represent" and needs to be comparable and consistent from year to year. The information should include explanations and interpretations about important underlying factors and existing conditions that may have affected performance to help users comprehend the information.

The failure to properly identify the impact of the implementation of UCT on the fire response time indicators reported in the MMR could mislead readers into believing that the FDNY's performance had improved when in fact no such improvement may have occurred. The FDNY could correct this by (1) adjusting either the prior years' response times or the current

[2] Under both methods, the "clock" stops when the first FDNY unit arrives on the scene.

year's response times to make them comparable to one another or (2) separately report the response time statistics before and after the UCT implementation while disclosing that the years for which figures are not reported is due to the use of different call-taking procedures.

Recommendation

1. FDNY should determine the average processing time that was eliminated with the implementation of the UCT procedures and adjust either the prior years' response times or the current year's response times to make them comparable to one another. If FDNY is unable to make these calculations, it should separately report the response time statistics using the pre- and post-UCT implementation methods.

FDNY Response: FDNY disagreed stating, "The implementation of UCT has not changed FDNY's reporting of response times. The FDNY has consistently reported Mayor's Management Report (MMR) Response Time statistics beginning with the FDNY's receipt of the call, regardless of the source, and ending with the first unit to report their arrival at the scene.

FDNY believes that the disclosure of the change in the call-taking process is sufficiently noted in the narrative of the MMR . . . for Fiscal Years 2009 and 2010…"

Auditor Comments: Although the implementation of UCT and the change in the call-taking process is disclosed in the narrative of the MMR for Fiscal Years 2009 and 2010 and its general impact on the processing time is reported in the narrative, there is no clear indication given in the fire response time statistics acknowledging that the decrease in the response time could—in whole or in part—be the result of this change. Therefore, the reader of the MMR cannot tell whether there has been an actual positive or negative change in response times.

Weaknesses Identified in FDNY Controls

Our review of the FDNY's CAD systems revealed weaknesses regarding identity management (user access) controls and disaster recovery plans, which should be addressed.

Comptroller's Directive #18 states that computer-stored information is an asset that is no different than the computer hardware itself and other more traditional assets. As with more tangible assets, electronic data is subject to a number of hazards. It can be stolen, tampered with, or misappropriated. It can also be rendered useless by the introduction of unintentional or purposeful errors, lost, or diverted to unauthorized individuals. Information thus corrupted can have a negative impact on an agency's general business or strategic decisions.

The directive further states that among the more widely used and visible forms of access controls used to safeguard electronic information is the utilization of user identifications and passwords. Another key element in the control over the information processing environment is

the incorporation of audit trails which should record the user identification associated with the event, date and time information, session data, and program and file usage.

According to the Department of Information Technology & Telecommunications' (DoITT) Identity Management policy, each agency is responsible for the management of user identities. This includes identity validation and registration, authentication, authorization, provisioning and de-provisioning, and management of identities. One monitoring control is to restrict access to only those users who are authorized to access the system.

Lack of Password Security Controls over the STARFIRE CAD

Except for the computer maintenance personnel, the FDNY does not have user identifications and passwords for its users of the STARFIRE CAD system. There is a compensating control used for accountability of the STARFIRE CAD system, but it is inadequate. Although FDNY Dispatching Directives require the Fire Alarm Dispatchers and Supervisors to log on and log off their positions by entering an assigned identification number, the system does not prevent anyone from accessing the system even if he/she had not entered his/her identification number to gain access to the system. According to the FDNY Chief of Communications, the STARFIRE CAD system is not designed to reject any numbers/letters/characters based on a list of authorized users. Furthermore, STARFIRE does not require entering a password to access the system.

According to FDNY officials, the STARFIRE CAD system was implemented in 1979, and the computer systems at that time did not have the capability for establishing user identifications and passwords. They further stated that while they are having discussions about upgrading the system, they feel that the physical security that exists where the dispatchers are located is adequate for now. We observed the physical security of the communications office in Brooklyn and found that key card access is needed to enter both the building and the floor where the dispatchers are located. In addition, the Supervisors sit in the same area as the Alarm Dispatchers and should be aware if an unauthorized individual is sitting at the terminals.

The FDNY is putting its electronic information in the STARFIRE CAD system at risk of being tampered with by possibly allowing unauthorized or inappropriate individuals or disgruntled employees to access it. Therefore, the FDNY needs to create controls over the data in the system to ensure it has basic security capabilities, such as identification and password controls of the individuals who are authorized to access the systems, restriction of individuals' access to specific data or resources, and creation of computer-generated audit trails of user activity.

EMS CAD System User Accounts Not Adequately Controlled

FDNY does assign user identification and passwords to users of the EMS CAD system. However, the FDNY did not disable the accounts for some of its users who were on extended leave or were no longer employed by the agency. The FDNY also assigned multiple user identifications to the same individual. This is contrary to Comptroller's Directive #18, which states that active password management includes deactivation of accounts for employees whose

services have terminated. Access authorization must be carefully designed to ensure that employees have access only to files or programs that are necessary for their job function.

The FDNY provided a list of 1,133 EMS CAD system user identifications as of October 22, 2010. Of the 1,133 user identifications, 958 were assigned to individuals employed (at one time) by the FDNY for EMS emergency response purposes; 137 were assigned to FDNY employees for administrative purposes or to non-employees of the FDNY (employees of voluntary hospital ambulance departments or the Department of Investigation); and 38 involved employees being assigned additional user identifications as discussed below. We then attempted to match all 958 individual users to the New York City Payroll Management System (PMS) database to determine whether they were active employees. We found that as of October 22, 2010, there were 100 users who were no longer working for the FDNY or were on extended leave, according to the PMS database.

This was brought to the attention of FDNY officials on December 22, 2010, and they responded that they have reviewed all 100 user identifications and have determined that 96 of the user identifications will be deleted or deactivated by FDNY's Bureau of Technology Development and Systems (BTDS). The FDNY stated that the remaining four user identifications will not be deactivated because three are for active FDNY employees and one is for an active employee of the Department of Investigation. When we subsequently reviewed the PMS records, we found that two of the three FDNY employees returned from leave after October 22, 2010, and one is currently on maternity leave and expected to return to work.

We also found that there were 36 employees who were assigned multiple user identifications (34 individuals had two user identifications and two individuals had three user identifications, resulting in 38 more user identifications than these 36 employees should have been assigned). This was brought to the attention of FDNY officials, who reviewed these 36 individuals to determine whether multiple user identifications are needed. Officials stated that they were going to delete the additional user identifications for eight of the employees because these individuals no longer needed multiple user identification. However, they added that the duties of the remaining 28 employees require them to maintain their multiple user identifications because of their multiple job functions. For example, a Lieutenant from the list has a primary role with the Bureau of Investigation and Trials. However, he also has the ability to work as a Field Supervisor. Another example is an Emergency Medical Technician responder from our list who has one user identification to log on to the Mobile Data Terminal[3] (MDT) in the ambulance and another to log onto the EMS CAD system as a dispatcher. This requires that he log in using specific user identifications for the particular duties that he will be performing.

By neglecting to delete inactive users from the system, the FDNY is increasing the vulnerability of the EMS CAD system to error, misuse, and abuse.

[3] MDTs are mobile computers located in emergency response vehicles that communicate with the CAD systems, providing two-way fire and medical emergency information between the emergency responder and the CAD systems.

Lack of Written Disaster Recovery Plans for STARFIRE CAD System and Data Warehouse

The FDNY has written disaster backup and recovery plans for the EMS CAD system, which included the automatic backup of data on a periodic basis, among other steps. However, although the FDNY does back up the data in its STARFIRE CAD system and the data warehouse, there are no written disaster recovery plans for either STARFIRE or the data warehouse.[4]

A written disaster recovery plan may help minimize or mitigate the impact any disruption may have on the FDNY's STARFIRE CAD system. Such a disruption could affect management's ability to provide timely and accurate information for reporting in the MMR.

Recommendations

FDNY should:

2. Install user identifications and passwords for its non-maintenance personnel of the STARFIRE CAD system.

FDNY Response: FDNY agreed stating, "The STARFIRE CAD system was implemented in 1979. FDNY is in the process of upgrading certain hardware and software that make up the STARFIRE system. Within these upgrades, we can include the implementation of user identifications and passwords but an implementation date has not yet been determined."

3. Ensure that access of employees whose services are terminated or on extended leave be removed from the EMS CAD system.

FDNY Response: FDNY agreed stating, "BTDS coordinates the provisioning and de-provisioning of EMS CAD user identities. FDNY Bureau of Personnel distributes various agency (employee status) reports on a monthly basis, which include: Separation Report, Leave Report (inactive status), and a Termination Report. Personnel updated the agency's monthly report distribution list to include CAD Programming and ECTP management, both of which are under BTDS. This report distribution update further enhances the provision and de-provision process of EMS CAD user identities."

4. Periodically review the EMS CAD system users who have multiple user identifications to ensure that only individuals who currently need multiple user identifications have them.

FDNY Response: FDNY agreed stating, "FDNY Emergency Medical Service Operations (EMS OPS) increased the frequency of EMS CAD multiple user identification reviews. In addition, EMS OPS, which is responsible for distributing EMS Personnel Orders, updated the agency's distribution list to include CAD Programming

[4] Because PMA is a system that is not maintained by the FDNY, it is not the focus of our audit.

and ECTP management, both of which are under BTDS. This report distribution update further enhances the provision and de-provision process of EMS CAD user identities."

5. Develop written disaster recovery plans for the STARFIRE CAD system and its data warehouse.

FDNY Response: FDNY agreed stating, "FDNY is currently in the process of implementing a STARFIRE Disaster Recovery site at our Queens Dispatch Central Office. This will include the necessary hardware, software and operations area in order for STARFIRE to be functional in the event of the loss of the STARFIRE system at 11MTC. This site should be implemented by the first quarter of CY 2012.

"Recently a contract was registered with Verizon to assist us with documenting our IT Disaster Recovery (DR) requirements, which will include our data warehouse among other systems. We estimate a four to six month effort in order to fully document our requirements. We then anticipate working closely with DoITT in identifying a DR site and provisioning and implementing FDNY's IT DR requirements."

Survey of Other Municipalities

We conducted a survey of response time indicators used by other cities to assess the relevance of those used by FDNY. We found no consensus regarding the types of response time indicators reported. Regarding the number of indicators reported, New York City, along with one other city, reported more indicators than any of the other municipalities surveyed. The results of our survey are presented in Appendix B for informational purposes.

DETAILED 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 objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. 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.

The scope period of this audit was July 2008 through October 2010. To achieve our audit objective, we performed a number of procedures and tests.

To gain an understanding of the FDNY's responsibilities pertaining to the compilation and reporting of performance indicators and to identify audit criteria where applicable, we reviewed the following:

- Chapter 1, §12 of the New York City Charter;
- *The Mayor's Management Report 2009*;
- *The Mayor's Management Report 2010*;
- City Department of Information Technology & Telecommunications Citywide Information Security Policies and Standards, specifically the Identity Management and Password Policies;
- Comptroller's Directive #1, *Principles of Internal Control*, and Agency Self-Assessment of Internal Controls questionnaire, completed by the FDNY for calendar year 2009;
- Comptroller's Directive #18, *Guidelines for the Management, Protection and Control of Agency Information and Information Processing Systems*;
- Instructional correspondence sent to the FDNY by the Mayor's Office of Operations on the compilation of performance data that will be reported in the MMR; and
- National Fire Protection Association 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*.

Further, we referred to GASB Concept Statements No. 2 (April 1994) and No. 5 (November 2008), *Service Efforts and Accomplishments (SEA) Reporting*, and GASB's *Suggested Guidelines for Voluntary Reporting: SEA Performance Information* (June 2010) to evaluate adherence to the essential components and qualitative characteristics of performance information presented by the FDNY in its performance indicators.[5]

We met with and/or conducted walk-through observations with Fire and EMS divisions' senior and mid-level management officials, various chiefs, dispatchers, programmers, and other

[5] GASB Concept Statements #2 and #5 establish that government performance information possess the qualitative characteristics of relevance, understandability, comparability, timeliness, consistency, and reliability.

personnel to obtain an understanding of the functions and the roles of individuals assigned to the units involved in the compilation and reporting of the performance indicators in the MMR, such as the FDNY's MAP Unit, BTDS, Bureau of Fire Investigation, and Bureau of Communications.

We obtained from the MAP Unit the reports that support the numbers for the critical indicators as reported in the 2009 MMR. We reviewed the numbers on these reports and compared them to the numbers reported in the MMR to ensure that the data reported in the MMR matched the data in the supporting documentation.

To assess relevant controls, we conducted walk-throughs and observations of related processes and reviewed the agency's self-assessment of its internal controls for calendar year 2009, performed in compliance with Comptroller's Directive #1. We also reviewed instructional correspondence from the Mayor's Office of Operations highlighting milestones and operational production target dates to the FDNY for the collection of performance data to be reported in the MMRs.

To document our understanding of the control environment, we prepared detailed flowcharts of the processes from the receipt of the alarm to the arrival of the first responders (e.g., firefighters, paramedics), from the time that the data is downloaded from the STARFIRE and EMS CAD systems to the data warehouse and up to the reporting of the response time statistics to the Mayor's Office of Operations. To ensure that our perception of the processes and controls was correct, we verified our understanding with FDNY officials. We then assessed these flowcharts to determine the areas of risk where data could be manipulated and designed test procedures to address these areas of concern.

To determine whether access to the data and dispatch systems used in compiling and reporting the performance information was appropriately restricted, we requested the user information, including but not limited to user identification, titles, first and last names, authorization levels, and creation dates of user identifications, for those users with "write access" to the STARFIRE CAD, EMS CAD, PMA, and the data warehouse. Further, we requested the user identification information of the maintenance personnel (i.e., those individuals who have the authority to modify the data in the system) for the STARFIRE and EMS CAD systems. We then compared the names of those employees with an active user identification as of October 22, 2010, to PMS to determine if these employees were still actively employed by the FDNY as of October 22, 2010.

To assess the reliability of the information contained in the data warehouse, we obtained from BTDS the IT programs used to download the data from the STARFIRE and EMS CAD systems to the data warehouse and the IT programs used to generate the *Fire Borough Activity Report* and the *EMS Response Time Report.* With the assistance of the Audit Bureau's IT Division, we then reviewed the programming codes used to input and extract data from the data warehouse to generate reports to determine whether appropriate logic was used.

In order to perform a test of completeness and to verify the accuracy of the response times reported in the MMR for the four critical indicators, we obtained from BTDS the daily Borough Activity Reports and EMS Response Time Reports for the sample month of June 2009,

and randomly selected five days – June 6, June 12, June 15, June 16, and June 29, 2009. We then obtained from BTDS all the incidents from the data warehouse that occurred on the five sample days. For these five days, we determined whether the data from the data warehouse contained all incidents from the STARFIRE and EMS CAD systems (completeness test). Then we calculated the average response times for the four critical indicators and compared the auditor's calculation to the response times reported in the daily *Fire Borough Activity Report* and *EMS Response Time Report* (accuracy test).

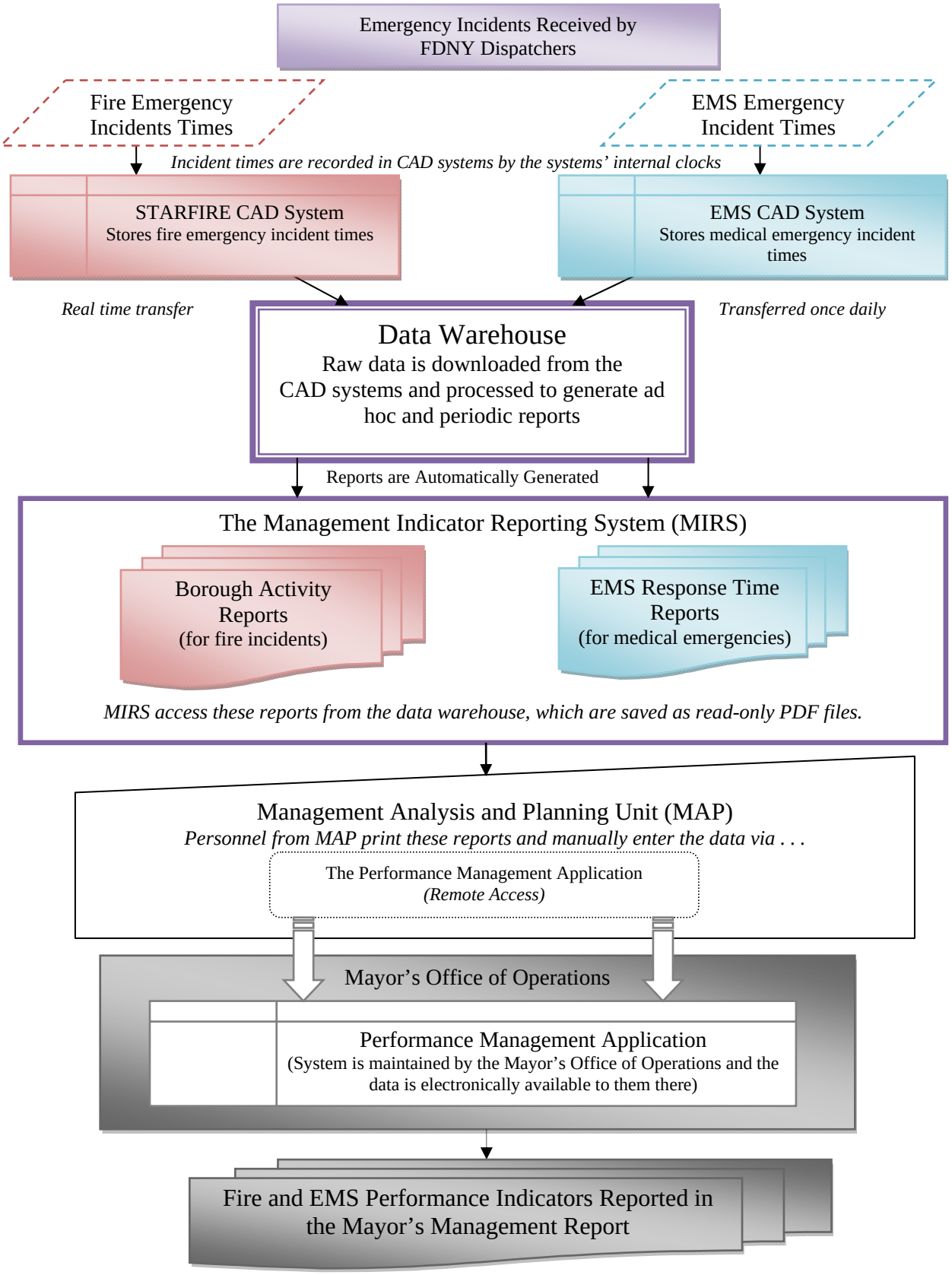
Based on the results of the completeness test that we performed for June 2009, we expanded our completeness test for more current data for the month of August 2010, which we judgmentally selected, and repeated the same steps used previously for the entire month.

In addition, to assess the relevance of the indicators FDNY uses, we surveyed 12 major United States cities and performed a comparative review of the response time performance indicators that were reported in the MMR against similar response time performance indicators reported by those cities.

First, we judgmentally selected the 10 largest U.S. cities based on their population size, limiting our selection to no more than two cities per state (based on the July 2009 estimates reported by the U.S. Census Bureau). We then judgmentally selected two major cities because of their proximity to New York City. (For a listing of the cities surveyed, see Appendix B).

We searched through the internet websites of these cities to determine if they regularly and publicly report performance indicators in citywide reports. We reviewed the performance indicators reported for each municipality's fire departments and determined which ones were related to response times to fires and medical emergencies. We then identified those response time performance indicators for each city and those reported in the MMR by the FDNY.

Flowchart of the FDNY Performance Indicator Preparation Process



Response Time Indicators Publicly Reported by the FDNY and the 12 Cities Surveyed

		Name of City													
		New York, NY	Los Angeles, CA (a)	Chicago, IL (a)	Houston, TX (a)	Phoenix, AZ (a)	Philadelphia, PA (a)	San Antonio, TX (a)	San Diego, CA (a)	Detroit, MI (a)	Jacksonville, FL (a)	Indianapolis, IN (a)	Newark, NJ (b)	Buffalo, NY (b)	Total Yes
	Are response time indicators currently reported by each city?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	No	No	**10**
Response Time Indicator															
1	**Average Response Time to Structural Fires**	**Yes**	No	**Yes**	No	No	No	No	No	No	No	No	No	No	**2**
2	**Average Response Time to Structural Fires and Medical Emergencies by Fire Units**	**Yes***	No	No	No	No	No	No	No	No	No	No	No	No	**1**
3	**Average Response Time to Life-Threatening Medical Emergencies by Ambulance Units**	**Yes**	No	No	No	No	No	No	No	No	No	No	No	No	**1**
4	**Average Response Time to Life-Threatening Medical Emergencies by Fire Units**	**Yes**	No	No	No	No	No	No	No	No	No	No	No	No	**1**
5	**Combined Response Time to Life-Threatening Medical Emergencies by Ambulance and Fire Units**	**Yes**	No	No	No	No	No	No	No	No	No	No	No	No	**1**
6	**Response Time of Less Than 10 Minutes to Advanced Life Support Medical Emergencies by Advanced Life Support Ambulances (percentage)**	**Yes**	No	No	No	No	No	No	No	No	No	No	No	No	**1**
7	**Maintain 90% or Better Rate for the First Fire Resource on the Scene within 5 Minutes of Notification (Fire Suppression)**	No	**Yes**	No	No	No	No	No	No	No	No	No	No	No	**1**
8	**Maintain a High Response Rate to Life-Threatening Medical Emergencies within 5 Minutes (Emergency Ambulance Service)**	No	**Yes**	No	No	No	No	No	No	No	No	No	No	No	**1**

			Name of City													
			New York, NY	Los Angeles, CA (a)	Chicago, IL (a)	Houston, TX (a)	Phoenix, AZ (a)	Philadelphia, PA (a)	San Antonio, TX (a)	San Diego, CA (a)	Detroit, MI (a)	Jacksonville, FL (a)	Indianapolis, IN (a)	Newark, NJ (b)	Buffalo, NY (b)	Total Yes
Response Time Indicator	9	Average Response Time to Advanced Life Support and Basic Life Support Ambulance Calls (Emergency Medical Services)	No	No	**Yes**	No	No	No	No	No	No	No	No	No	No	**1**
	10	Average Response Time – Fire	No	No	No	**Yes**	No	**Yes**	No	No	No	No	No	No	No	**2**
	11	Average Response Time -- Advanced Life Support Calls	No	No	No	**Yes**	No	No	No	No	No	No	No	No	No	**1**
	12	Average Response Time -- Basic Life Support Calls	No	No	No	**Yes**	No	No	No	No	No	No	No	No	No	**1**
	13	Average Response Time by First Fire Unit	No	No	No	No	**Yes**	No	No	No	No	No	No	No	No	**1**
	14	Percentage of Time First Fire Unit Arrives on Scene in 4 Minutes or Less	No	No	No	No	**Yes**	No	No	No	No	No	No	No	No	**1**
	15	Percent of Fire and Emergency Medical Call Response within 4 Minutes	No	No	No	No	**Yes**	No	No	No	No	No	No	No	No	**1**
	16	Percentage of Time Advanced Life Support Medical Calls are Responded to with Paramedic Units within 5 Minutes	No	No	No	No	**Yes**	No	No	No	No	No	No	No	No	**1**
	17	Percentage of Time First Advanced Life Support Unit is on Scene within 9 Minutes or Less 90% of the Time	No	No	No	No	**Yes**	No	No	No	No	No	No	No	No	**1**
	18	Percentage of Time First Ambulance is on Scene of a Medical Emergency Incident within 10 Minutes or Less 90% of the Time	No	No	No	No	**Yes**	No	No	No	No	No	No	No	No	**1**
	19	Percent of Time EMS Response is within 9 Minutes	No	No	No	No	No	**Yes**	No	No	No	No	No	No	No	**1**
	20	Average Response Time for a Fire Truck or Engine to Arrive to Emergency Incidents from Dispatch to Arrival	No	No	No	No	No	No	**Yes**	No	No	No	No	No	No	**1**

The City of New York

FIRE DEPARTMENT
9 MetroTech Center Brooklyn, N.Y. 11201-3857

SALVATORE J. CASSANO
Fire Commissioner Suite 8W-6

August 4, 2011

H. Tina Kim
Deputy Comptroller
Bureau of Audit
The City of New York Office of the Comptroller
1 Centre Street
New York, NY 10007-2341

Re: **Audit Report on the New York City Fire Department's Performance Indicators as Reported in the Mayor's Management Report – MH10-139A**

Dear Deputy Comptroller Kim:

I write in response to the draft "Audit Report on the New York City Fire Department's Performance Indicators as Reported in the Mayor's Management Report", dated July 22, 2011. Please thank your staff for the time and diligence that they put into this audit. The Department appreciates their efforts and intends to utilize their recommendations.

I have attached a copy of the Fire Department's Agency Implementation Plan (AIP) which responds to the five recommendations made by the Office of the Comptroller in the audit referenced above.

As detailed in the AIP, we agree with a large percentage of the recommendations in the report, noting that the Department had previously recognized some of these same issues. As a result, we have already begun to take steps to address these recommendations.

If you have any questions about our response or AIP, please contact Domenick Loccisano, Executive Director of Compliance and Internal Audit, at (718) 999-5180.

Sincerely,

Salvatore J. Cassano
Fire Commissioner

cc: Edward Kilduff, Chief of Department
Robert Sweeney, Chief of Fire Operations
Abdo Nahmod, Chief of EMS Operations
Robert Boyce, Chief of Communications
Michael Vecchi, Associate Commissioner of Management Initiatives
Stephen Rush, Assistant Commissioner of Budget & Finance
Donald Stanton, Assistant Commissioner of Technology Development & Systems
George Davis III, Deputy Director, Mayor's Office of Operations

FDNY Agency Implementation Plan

Audit #: **MH10-139A**

Audit Name: **Audit Report on the New York City Fire Department's Performance Indicators as Reported in the Mayor's Management Report**

Rec. #:

01 **Recommendation**

FDNY should determine the average processing time that was eliminated with the implementation of the UCT procedures and adjust either the prior years' response times or the current year's response times to make them comparable to one another. If FDNY is unable to make these calculations, it should separately report the response time statistics using the pre- and post-UCT implementation methods.

FDNY Response

DISAGREE. The implementation of UCT has not changed FDNY's reporting of response times. The FDNY has consistently reported Mayor's Management Report (MMR) Response Time statistics beginning with the FDNY's receipt of the call, regardless of the source, and ending with the first unit to report their arrival at the scene.

FDNY believes that the disclosure of the change in the call-taking process is sufficiently noted in the narrative of the MMR (below) for Fiscal Years 2009 and 2010, which states explicitly:

"The City's initiative to unify call-taking among the Police and Fire departments became effective in May 2009. The Police Department now handles a portion of call-taking previously processed by fire dispatchers for most fire unit incidents, and therefore that interval is no longer included in the statistics."

02 **Recommendation**

Install user identifications and passwords for its non-maintenance personnel of the STARFIRE CAD system.

FDNY Response

AGREE. The STARFIRE CAD system was implemented in 1979. FDNY is in the process of upgrading certain hardware and software that make up the STARFIRE system. Within these upgrades, we can include the implementation of user identifications and passwords but an implementation date has not yet been determined.

Audit #: **MH10-139A**

Rec. #:
02 cont.

However, currently there are two layers of security for STARFIRE. The first layer is physical. Only terminals that are defined by the technology staff can connect to the system. In order to connect to STARFIRE, a proprietary terminal client (called PC/CRT) must be installed on a workstation and a properly constructed configuration file must be installed along with the client. The IP address of the workstation must be contained in one of the six configuration files that are part of the network definition files maintained by the Bureau of Technology Development and Systems (BTDS).

This means that no workstation that is not known to the FDNY technology staff can connect to STARFIRE. All workstations that are included in the network files are in secure locations like the dispatch offices and the Operations Center. There is no remote access to STARFIRE. There is no telnet or web access to STARFIRE.

The second layer of security is functional. The functionality of each workstation is limited by definition in the network files. Only a terminal on the dispatch floor can enter/open, modify, or close an incident. Terminals not on the dispatch floor can view but not modify incidents in any way. Within the terminals on the dispatch floor, only terminals configured as "Decision Dispatcher" can add units to an incident. All incident transactions include the unique name of the terminal from which the transaction is submitted.

There is also an audit feature within STARFIRE that allows dispatch management to record which dispatcher is assigned to which terminal. The information is maintained by the shift supervisor.

03

Recommendation

Ensure that access of employees whose services are terminated or on extended leave be removed from the EMS CAD system.

FDNY Response

AGREE. BTDS coordinates the provisioning and de-provisioning of EMS CAD user identities. FDNY Bureau of Personnel distributes various agency (employee status) reports on a monthly basis, which include: Separation Report, Leave Report (inactive status), and a Termination Report. Personnel updated the agency's monthly report distribution list to include CAD Programming and ECTP management, both of which are under BTDS. This report distribution update further enhances the provision and de-provision process of EMS CAD user identities.

Audit #: **MH10-139A**

Rec. #:

04 **Recommendation**

Periodically review the EMS CAD system users who have multiple user identifications to ensure that only individuals who currently need multiple user identifications have them.

FDNY Response

AGREE. FDNY Emergency Medical Service Operations (EMS OPS) increased the frequency of EMS CAD multiple user identification reviews. In addition, EMS OPS, which is responsible for distributing EMS Personnel Orders, updated the agency's distribution list to include CAD Programming and ECTP management, both of which are under BTDS. This report distribution update further enhances the provision and de-provision process of EMS CAD user identities.

05 **Recommendation**

Develop written disaster recovery plans for STARFIRE CAD system and its data warehouse.

FDNY Response

AGREE. FDNY is currently in the process of implementing a STARFIRE Disaster Recovery site at our Queens Dispatch Central Office. This will include the necessary hardware, software and operations area in order for STARFIRE to be functional in the event of the loss of the STARFIRE system at 11MTC. This site should be implemented by the first quarter of CY 2012.

Recently a contract was registered with Verizon to assist us with documenting our IT Disaster Recovery (DR) requirements, which will include our data warehouse among other systems. We estimate a four to six month effort in order to fully document our requirements. We then anticipate working closely with DoITT in identifying a DR site and provisioning and implementing FDNY's IT DR requirements.

			Name of City													
			New York, NY	Los Angeles, CA (a)	Chicago, IL (a)	Houston, TX (a)	Phoenix, AZ (a)	Philadelphia, PA (a)	San Antonio, TX (a)	San Diego, CA (a)	Detroit, MI (a)	Jacksonville, FL (a)	Indianapolis, IN (a)	Newark, NJ (b)	Buffalo, NY (b)	Total Yes
Response Time Indicator	21	Percentage of Time First Unit/Ladder Arrives on Scene within 5 Minutes (Responding to Arrival)	No	No	No	No	No	No	**Yes**	No	No	No	No	No	No	**1**
	22	Percentage of Advanced Life Support Units (Fire or EMS Unit) Arriving on Scene within 8 Minutes of Response	No	No	No	No	No	No	**Yes**	No	No	No	No	No	No	**1**
	23	Percent of Initial Unit Emergency Response Arrival within NFPA Guideline of 5 Minutes or Less	No	No	No	No	No	No	No	**Yes**	No	No	No	No	No	**1**
	24	Percent of Effective Fire Force Emergency Response Arrival within NFPA Guideline of 9 Minutes or Less	No	No	No	No	No	No	No	**Yes**	No	No	No	No	No	**1**
	25	Percent EMS Response Time Complies with City-wide Standards	No	No	No	No	No	No	No	**Yes**	No	No	No	No	No	**1**
	26	City-wide Response Times	No	No	No	No	No	No	No	No	No	**Yes**	**Yes***	No	No	**2**
		Total Number of Response Time Indicators Reported	**6**	**2**	**2**	**3**	**6**	**2**	**3**	**3**	**0**	**1**	**1**	**0**	**0**	

Legend: ***** No performance target or goal is indicated for the response time statistic in its citywide report.
(a) Ten largest U.S. cities selected based on their population size.
(b) Two major cities selected because of their proximity to New York City.