

NEW YORK STATE OFFICE OF THE STATE COMPTROLLER

**H. Carl McCall
STATE COMPTROLLER**



***FIRE DEPARTMENT
OF THE CITY OF NEW YORK***

***SELECTED VEHICLE
MAINTENANCE PRACTICES***

REPORT 2000-N-5

**DIVISION OF MANAGEMENT AUDIT AND
STATE FINANCIAL SERVICES**

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110 State Street

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Albany, NY 12236



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STATE COMPTROLLER

Report 2000-N-5

Mr. Thomas Von Essen
Commissioner
Fire Department of the City of New York
9 Metrotech Center 8th Floor
Brooklyn, NY 11201-3857

Dear Mr. Von Essen:

The following is our report regarding selected vehicle maintenance practices of the Fire Department of the City of New York.

This audit was performed pursuant to the State Comptroller's authority as set forth in Article V, Section 1 of the State Constitution, Article II, Section 8 of the State Finance Law and Article III of the General Municipal Law. Major contributors to this report are listed in Appendix A.

Office of the State Comptroller
Division of Management Audit
and State Financial Services

March 8, 2002

Division of Management Audit and State Financial Services

110 STATE STREET ♦ ALBANY, NEW YORK 12236
123 WILLIAM STREET ♦ NEW YORK, NEW YORK 10038

Executive Summary

Fire Department of the City of New York Selected Vehicle Maintenance Practices

Scope of Audit

The Fleet Services Division (Fleet) of the Fire Department of the City of New York (FDNY), repairs and maintains a fleet of 1,833 vehicles and equipment, including firefighting apparatus, rescue and other front-line vehicles, ambulances and support vehicles. The FDNY also maintains a parts inventory for fleet maintenance. Fleet's fiscal year 2000-01 budget totaled nearly \$22 million, comprising \$14.6 million for the personal service costs of 282 employees and \$7.4 million for vehicle parts and other expenses. In March 1999, FDNY implemented the citywide Maintenance Control and Management System (MCMS) for recording, monitoring and reporting on the FDNY's fleet maintenance and parts inventory activities. MCMS implementation was coordinated by the Department of Citywide Administrative Services (DCAS) to manage fleet maintenance for all of the various City agencies that use and maintain vehicles, such as police, sanitation and fire.

Our audit addressed the following questions concerning the vehicle fleet maintenance by FDNY for the period from July 1, 1998 through August 31, 2000:

- ! Does FDNY repair and maintain its firefighting apparatus and ambulances in a timely and cost-effective manner and in accordance with manufacturer's recommendations?

- ! Does FDNY maintain adequate controls over its vehicle parts inventory?

Audit Observations and Conclusions

We found that FDNY performed fewer preventive maintenance checks of its firefighting apparatus than are required by its stated schedule. Further, we concluded that MCMS information is generally unreliable for tracking repair and maintenance schedules and costs, or for determining whether Fleet performs maintenance tasks in a timely and cost-effective manner. We also found that FDNY needs to significantly improve controls over its inventory of vehicle parts.

FDNY has no written preventive maintenance policies. We were told that Fleet schedules ambulances and firefighting apparatus to undergo detailed checks at 45-day and 90-day intervals, respectively. Our test of summary records for a 21-month period ended March 31, 2000 revealed that Fleet generally checked its ambulances according to schedule, but had performed just five of the seven checks due for firefighting apparatus. Further, on the day we visited one preventive maintenance facility, only four of ten vehicles

were brought in for their appointments. We recommend that FDNY formalize its policies for, and monitor the delivery of, preventive maintenance services for vehicle safety, to avoid the cost and vehicle down time associated with unexpected repairs, and to make more efficient use of maintenance resources. (See pp. 5-6)

FDNY's unofficial fleet maintenance philosophy is to have apparatus available at all times to respond to emergencies. However, management has no formal objectives, specific goals, or performance measures to determine how efficiently and effectively Fleet is doing its job. There are no formal work standards for repair and maintenance tasks, or policies to guide certain operational decisions (e.g., repair vs. replace; ratio of spare to active apparatus). Further, we found that FDNY's sole reported performance statistic, "out-of-service" hours by vehicle type, is not accurate because it does not include all of the time the vehicle is not available for use. For example, from arrival at the repair shop until it is actually serviced is not included. We recommend FDNY establish objectives and goals for Fleet operations, develop measurable performance indicators and monitor progress in achieving these goals. (See pp. 6-8)

In evaluating the reliability of MCMS data about Fleet operations, we examined MCMS inputs and outputs, not the DCAS system controls. We concluded that weaknesses in the system itself and FDNY's inconsistent use of MCMS limits its utility for efficient tracking and coordination of Fleet maintenance efforts. FDNY had outdated procedures for MCMS, and FDNY training staff was not well versed in its use. MCMS does not have enough internal checks to prevent entry of inconsistent data and FDNY officials do not request exception reports. We found instances where the repair order completion dates preceded start dates, resulting in inaccurately reported out-of-service hours. Some information, like warranty work on firefighting vehicles, overtime hours and fuel usage, is recorded on PC-based or manual recordkeeping systems, rather than MCMS; other data, such as preventive maintenance scheduling, is entered successively on three different systems. To improve the completeness and reliability of data needed for decision-making and reporting purposes, we recommend FDNY update and maintain MCMS procedures, train appropriate FDNY staff to use MCMS, work with DCAS to remove weaknesses and gradually phase out duplicate record keeping systems. (See pp. 8-13)

We also found FDNY does not follow the basic inventory control standards promulgated by the New York City Department of Investigation (DOI) to manage its inventory of spare vehicle parts. There are no written policies and procedures for inventory-related functions, such as performing independent physical counts and reducing stores of obsolete items. We recommend FDNY improve control over these assets by complying with DOI standards. (See pp. 15-17)

Comments of FDNY Officials

A draft copy of this report was provided to FDNY officials for their review and comment. Their comments have been considered in preparing this final report, and are included as Appendix B.

FDNY officials indicated they have implemented or are in the process of implementing our audit recommendations. They state that FDNY'S prime objective is to ensure that properly maintained and serviced vehicles are available at all times to respond to emergencies. In addition, they point out that FDNY adheres to the New York City Office of Fleet Administration policies on fleet maintenance and that vehicle maintenance is done in a cost effective, efficient, and professional manner.

We are pleased that the FDNY is in general agreement with our recommendations which, we believe will improve Fleet's operations.

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Introduction

Background

The Fire Department of the City of New York (FDNY) protects the life and property of New York City residents and visitors from fire and critical health threats. To help carry out its mission, FDNY's Fleet Services Division (Fleet) repairs and maintains its 1,833 vehicles and related equipment. These include 476 active, reserve and spare fire engines and ladder trucks, 27 rescue and other front-line equipment, 411 ambulances (operated by the Emergency Medical Services Unit) and 919 support vehicles, ranging from sport utility vehicles to forklifts. (See Exhibit A.) The FDNY has reserve firefighting equipment stationed around the five boroughs to be used in case of a major disaster and spare vehicles to temporarily replace fire company out-of-service vehicles.

There is a central repair facility for firefighting apparatus at 34th Street in Queens and a preventive maintenance facility for firefighting apparatus and ambulances at Randall's Island. A central repair facility at 58th Street in Queens does both repair and preventive maintenance work for ambulances and support vehicles. Two satellite locations also perform ambulance repairs and preventive maintenance, and road crews are available to handle emergency repairs. Fleet also has several parking lots for storage of spare and decommissioned vehicles and vehicles awaiting repair. FDNY maintains a parts inventory for fleet maintenance in storage warehouse areas, in various machine and work shops, at satellite repair shops and with various emergency road crews. The recorded value of this inventory exceeded \$6.7 million as of March 31, 2000.

Fleet's fiscal year 2000-01 budget totaled nearly \$22 million, comprising \$14.6 million for personal services associated with 282 employees and \$7.4 million for parts and other expenses. The budget was split almost evenly between firefighting apparatus/equipment repair and maintenance and ambulance repair and maintenance. Budgeted maintenance costs averaged nearly \$11,000 per vehicle for the 2000-01 fiscal year. Fleet reported that, for the 23-month period ended May 2000, its staff worked on more than 42,000 work orders, 11,000 (26 percent) of which represent preventive maintenance work.

FDNY uses the Maintenance Control and Management System (MCMS), an on-line processing system, to record maintenance information. MCMS was implemented by the City's Department of Citywide Administrative Services to manage fleet maintenance for all City agencies that use and maintain vehicles, such as the police, fire and sanitation. MCMS is designed to control the following areas of fleet maintenance: parts inventory control; purchase order management; equipment maintenance and performance; warranty management; labor reporting; equipment location; and system

accounting. MCMS replaces the FDNY's former system that was not Year 2000 compliant. Conversion to MCMS began in December 1998, and the system completion date was March 12, 1999. FDNY uses information generated by MCMS to report on selected aspects of Fleet performance in the Mayor's Management Report. This report presents the goals, objectives and performance of the various New York City agencies. System modifications to MCMS were ongoing during our audit period.

Audit Scope, Objectives and Methodology

We audited FDNY's vehicle and equipment repair and maintenance practices for the period July 1, 1998 through August 31, 2000. The objectives of our performance audit were to determine whether the FDNY repairs and maintains its firefighting apparatus, ambulances and other front-line vehicles in a timely and cost-effective manner consistent with the manufacturer's recommended service intervals, and whether the FDNY has established adequate control over its vehicle parts inventory. To accomplish our objectives, we interviewed FDNY officials, reviewed maintenance records (including work orders) and observed maintenance activities. We also reviewed how the FDNY implements and uses the Maintenance Control Management System for scheduling, monitoring and accounting for vehicle repairs and maintenance, and we examined the Mayor's Management Reports for the fiscal years ended June 1999 and June 2000. We visited 20 fire stations throughout New York City to review maintenance and repair records and interview firefighters about the maintenance on their vehicles. Furthermore, we reviewed the processes, records and physical storage of the FDNY parts inventory. We did not review FDNY maintenance practices with regard to support vehicles.

As noted earlier, DCAS implemented MCMS for City agencies to use in tracking vehicle repairs and maintenance. However, we did not audit DCAS on this engagement. Accordingly, we did not evaluate MCMS system controls. We limited our evaluation of MCMS to examining FDNY system inputs and outputs.

We conducted our audit in accordance with generally accepted government auditing standards. Such standards require that we plan and perform our audit to adequately address those operations of the FDNY included in our audit scope. Further, these standards require that we understand the FDNY's internal control structure and its compliance with those laws, rules and regulations that are relevant to the operations included in our audit scope. An audit includes examining, on a test basis, evidence supporting transactions recorded in the accounting and operating records and applying such other auditing procedures as we consider necessary in the circumstances. An audit also includes assessing the estimates, judgments, and

decisions made by management. We believe that our audit provides a reasonable basis for our findings, conclusions and recommendations.

We use a risk-based approach when selecting activities to be audited. This approach focuses our audit efforts on those operations identified through our preliminary survey as having the greatest probability for needing improvement. Consequently, by design, finite audit resources are used to identify where and how improvements can be made. Thus, we devote little audit effort to reviewing operations that may be relatively efficient or effective. As a result, our audit reports are prepared on an “exception basis.” This report, therefore, highlights those areas needing improvement and does not address activities that may be functioning properly.

Comments of FDNY Officials to Audit

We provided FDNY officials with a draft copy of this report for their review and comment. Their comments were considered in preparing this final report, and are included as Appendix B.

Within 90 days after final release of this report, we request the Commissioner of the Fire Department of New York to report to the State Comptroller, advising what steps were taken to implement the recommendations contained herein, and where recommendations were not implemented, the reasons therefor.

Vehicle Maintenance and Repair

Our review of Fleet's maintenance summary records showed Fleet did not inspect its firefighting apparatus according to its stated preventive maintenance schedule. We also found the FDNY does not have any formal work standards or sufficient performance measures related to the economy and efficiency of various Fleet maintenance tasks. Further, certain problems with MCMS, such as insufficient edit checks along with Fleet's incorrect and inconsistent use of the system, currently undermine its reliability for the efficient tracking and coordination of maintenance efforts.

Preventive Maintenance

The FDNY has no written policies as to the frequency and level of preventive maintenance checks which are required for its emergency vehicle fleet. However, FDNY officials told us Fleet uses a checklist in doing its preventive maintenance work and has a preventive maintenance schedule, comparable to the industry level "B" preventive maintenance inspections. According to this schedule, ambulances are supposed to undergo detailed checks at 45-day intervals, while firefighting apparatus are checked at 90-day intervals (about every 3,000 miles). Officials explained that they try to schedule preventive maintenance on the firefighting apparatus to coincide with the firefighters' required quarterly medical examinations. In response to our draft report, FDNY officials advised that generic performance standards do not apply to their custom-built fire apparatus. As a result, they did not historically have the ability or sufficient computerized performance data for analysis. However, they currently monitor performance based on experience levels, repair complexity and vehicle specifications.

We reviewed the FDNY's preventive maintenance operations at Randall's Island (for firefighting apparatus and ambulances) and at 58th Street, Long Island City (for ambulances and support vehicles). We selected a random sample of 55 of the 424 pieces of fire apparatus and front-line vehicles and 55 of the 416 ambulances and found that the FDNY does not perform as many preventive maintenance checks as it should, according to its schedules. For example, preventive maintenance history records for the 110 fire, ambulance and frontline vehicles showed that, for all the firefighting apparatus and other front-line vehicles in its fleet, FDNY performed an average of just five of the seven preventive maintenance checks due per vehicle during the 21 months from July 1, 1998 to March 31, 2000. During the same period, Fleet completed almost all the checks due for the FDNY ambulances, performing an average of 13 of the 14 ambulance checks due per vehicle.

When preventive maintenance does not occur, the FDNY has less assurance of vehicle safety and reliability, and incurs a greater risk of vehicle down time and/or expensive repair cost. Management should establish formal written preventive maintenance policies for firefighting apparatus and ambulances. These policies could address management's preventive maintenance priorities and the timing of vehicle checks, and consider the manufacturer's recommended service intervals. Manufacturers recommend a variety of preventive maintenance checks at prescribed mileage intervals, as well as an annual comprehensive inspection and adjustment for these vehicles. Management must also monitor compliance with its policies for preventive maintenance. We found that Fleet management does not oversee the performance of preventive maintenance checks or get feedback from the fire stations and maintenance facilities. For example, no one was aware that one engine company was not on the preventive maintenance schedule for about eight months, from August 26, 1999 to April 5, 2000.

Lack of management monitoring and coordination can also result in inefficiency. We found that the Randall's Island preventive maintenance facility was underutilized. On a day we visited Randall's Island, only four of ten company vehicles showed up for their scheduled preventive maintenance appointments, with the result that mechanics had to seek out other work. There is reportedly a pattern of missed appointments at this facility. To reduce the likelihood of missed appointments and the inefficient use of staff time, Fleet management should monitor the inspection process. As discussed later in this report, however, Fleet's inconsistent use of MCMS hampers efforts to monitor maintenance or control other operational functions.

Performance Measures

Management should state an organization's clearly defined objectives to focus the organization's efforts, and translate these objectives into specific goals to be able to measure progress in accomplishing the objectives. However, we found that the FDNY has not developed formal goals and objectives for fleet maintenance. Although the FDNY's unofficial fleet maintenance philosophy is that there should be firefighting apparatus available at all times to respond to emergencies, FDNY has not developed any formal goals and objectives for fleet maintenance. For example, there is no written policy on the recommended number of spare vehicles, or the process to follow in making repair vs. replace decisions. Lack of policies on the spare vehicles needed could lead to excess inventory in spare equipment. In fact, Fleet officials acknowledged the ratio of spare to active firefighting vehicles (25 percent and 20 percent, respectively, for engines and ladders) may be higher than it should be. Lack of policies regarding when to repair or replace equipment could lead to unnecessary purchases or unwarranted repairs.

We also found that Fleet has not established work standards and performance measures for various maintenance and repair tasks to allow management to assess the economy and efficiency of operations and to identify opportunities for improvement. Although Fleet studied the development of work standards for various repairs in 1994, it did not implement such standards and does not monitor the reasonableness of actual time spent on various maintenance and repair tasks. We noted that labor times for a number of tasks vary from the 1994 study data, and that current labor times for the same task also vary from employee to employee. Fleet managers told us that they decided to delay the development of work standards until they have a reliable information system in place that would provide labor hours and other work order data for performance measurement.

The New York City Mayor is required by the City Charter to publicly present goals and objectives for each City agency and assess their performance against established indicators. The Mayor's Management Report is one document used for this purpose. The only fleet maintenance performance statistic the FDNY reports is "out-of-service" percentages by type of vehicle, which appears in the Mayor's Management Report. However, we concluded that this statistic misstates the total time vehicles are not available for service because it includes only the time the vehicles are in the maintenance shop. For example, March 2000 work orders for Engine 222 and Ladder 108, did not account for several days of out-of-service time when the vehicles were parked awaiting service. Further, the out-of-service statistic does not capture time vehicles are not in use because they are waiting for repairs under warranty. Actual out-of-service time due to warranty work ranged from 1 to 83 days for vehicles in a sample of warranty folders generated between January 1999 and May 2000. As a result of not setting formal objectives for Fleet activities, and not establishing performance measures for its operational functions, FDNY cannot determine whether Fleet is operating as effectively and efficiently as it could. Management needs to establish performance measures for equipment availability and other measures for costs (e.g., out-of-service time, maintenance incidences by mileage) and analyze the data to regularly evaluate Fleet's performance. However, for performance measurement data to be useful, it must be reliable. Our review of Fleet's recording of vehicle maintenance data on MCMS disclosed it was not sufficiently complete or accurate to be used for performance measurement.

Maintenance Control and Management System

To control operations and make sure they are efficient and effective, management must have access to reliable information about the organization's everyday functions and the results. However, Fleet managers told us their job is to repair the vehicles, not to do record keeping. MCMS,

FDNY's automated information system, is viewed as an additional burden for the vehicle maintenance staff, not as a tool to help them do their jobs. According to a number of FDNY managers and staff, DCAS developed MCMS without adequately consulting FDNY users to obtain their input prior to and during system implementation on the best way to track repair and maintenance data. DCAS officials advised us the process used to implement MCMS provided numerous opportunities to provide input as the system was being implemented. In addition, DCAS advised us they held training sessions for FDNY personnel. Management's viewpoint of MCMS may account for the fact that many duplicate systems were still in operation 18 months after MCMS was supposed to have been fully implemented. We found that maintenance staff are reluctant to give up previously used PC-based and manual recordkeeping systems. Some information is recorded in these alternate sources, and is then entered in MCMS; other information is never recorded in MCMS. Staff may also question the reliability of MCMS. In fact, we found the system needs enhancements to improve the accuracy of its reported data. As a result of MCMS weaknesses and FDNY's inconsistent and incorrect use of the system, Fleet staff engage in significant duplicate effort, MCMS data is not complete and accurate and management does not have reliable information about Fleet operations.

Policies and Procedures for MCMS

FDNY management is responsible for ensuring that there are up-to-date policies and procedures that address all the requirements for efficient vehicle maintenance operations, including the proper reporting of maintenance data on the information system. Policies provide the guidance staff need to do their jobs, and set the standards by which management can measure and monitor results. We found that policies and operating procedures relating to fleet maintenance activities were dated October 1998. Procedures manuals have not been updated since the March 1999 implementation of MCMS to reflect changes that resulted from several enhancements and changes to the system since October 1998. For example, we were told by FDNY officials the descriptions for certain reports were not in the MCMS Manual (Manual). However, it was explained to us that these reports were not in the Manual because they were specifically designed for FDNY use, and other City agencies use the Manual. Even so, without instructions, FDNY managers and staff are unlikely to be able to produce such reports and use MCMS effectively. DCAS officials state they have documented all program enhancements and changes as of July 2000. It is important that FDNY managers work closely with DCAS staff to ensure that documentation is complete, accurate and up-to-date and that the system is understood.

We also found that the FDNY record maintenance unit staff was neither well versed in the use of the system, nor knowledgeable about the

composition and backup data of the various reports available. FDNY officials need to be fully aware of the information in MCMS Training Manuals so they can instruct their staff on how to properly enter maintenance and repair information on MCMS in an accurate and consistent manner. However, our review of repair orders showed that the exact same repair was coded differently in MCMS when entered by different persons. Another discrepancy concerned the dates recorded on the repair orders. There are no automated procedures, such as system edits, to flag input where the work completion predates the repair order opening date. Additionally, there is no procedure to review output for these and other errors. We found that when contradictory entries are made, the work order activities involved are simply not included in the monthly out-of-service reports. To provide assurance that Fleet managers and staff use MCMS properly to record vehicle maintenance and repair operations, it is essential that FDNY develop current and appropriate policies and procedures for MCMS, and train all FDNY staff how to use the system.

Implementation of MCMS

According to the Manual, a reliable vehicle maintenance computer system must be able to perform the following essential functions:

- ! accurately and completely record all maintenance performed on vehicles, including parts, as well as direct and indirect labor;
- ! record fuel usage and associated mileage;
- ! schedule and track preventive maintenance (required and performed);
- ! track and recover warranty claims at both vehicle and component level;
- ! produce vehicle performance analysis reports to monitor and improve maintenance functions;
- ! demonstrate consistent reporting of data from period to period and from report to report; and
- ! provide user-defined edits and validations, as well as exception reports.

As noted earlier in this report, we did not audit DCAS involvement with the system. Therefore, our review of MCMS operation was based on our discussions with FDNY officials, our observation of system use and our analyses of MCMS input and output, including various summary and detailed MCMS vehicle maintenance reports. As a result of this review, we

concluded that the FDNY's use of MCMS does not produce complete and accurate operations data. The following are examples of our findings for each of the above functions.

a. Complete and accurate maintenance records

There are insufficient internal checks or flags to prevent the entry of inconsistent or contradictory information into MCMS. As noted earlier, we found instances where the repair order completion date on a work order preceded its start date. We also found that maintenance staff sometimes reopen a previously closed work order, add labor hours or other data to the work order, and then close it again. This reopening and closing of the same order can happen multiple times. However, each time a staff person reopens (and closes) a work order, MCMS interprets the event as a new job, with its own set of out-of-service hours. This practice results in overstating both the number of work orders done and the number of out-of-service hours.

We also found that no confirmation or corroboration of the labor hours and costs that are entered in MCMS with either time clocks or the payroll. We reviewed the work activity performed by eight employees at Randall's Island on March 24, 2000 and could not account for a number of hours for two of these employees. Time charged to repair orders (both direct and indirect) showed only four hours that day for one employee and only six hours that day for another employee. In addition, there are at least three separate systems accounting for employees' time at the repair facilities. Repair order labor hours, as reported on MCMS, do not include overtime hours, which are recorded on a different system. Further, Fleet records indirect time on separate repair orders each month and then reports this number in the aggregate in the monthly management reports. We concluded that work order labor costs reported on MCMS are not reliable.

b. Record fuel usage and associated mileage

FDNY does not record and track accurate vehicle mileage at each instance of repair or maintenance, even though MCMS can capture this data. Fleet officials told us that mileage is recorded and tracked on a separate system at the fuel dispensing stations. The lack of accurate meter readings at each maintenance event precludes any kind of meaningful performance and cost analysis about the frequency or severity of repairs, preventive maintenance, forecasting replacement cycles, etc. Other large fleet maintenance routinely compile various performance measures. For example, entities all public transit companies submit various types of performance data to the U.S.

Department of Transportation which can be used to monitor various aspects of maintenance performance and can be used to set standards for, monitor and evaluate performance and then report the results.

c. Schedule and track preventive maintenance

FDNY maintains preventive maintenance information manually. Information relevant to preventive maintenance scheduling and inspections is recorded manually, entered into a PC-based system, and finally recorded again on MCMS. However, the lack of sufficient internal checks to prevent entry errors in MCMS, the lack of vehicle mileage data in MCMS and the absence of management monitoring or feedback from inspection facilities or fire stations precludes efficient tracking of this function.

d. Track and recover warranty claims

FDNY maintains and tracks warranty information for its ambulances on MCMS. However, FDNY uses a separate PC-based system, not MCMS, to track warranty work on new firefighting apparatus. Thus, MCMS does not show repair orders opened for warranty work on these vehicles, and related out-of-service hours do not appear on the MCMS. As a result, the monthly out-of-service statistic for firefighting apparatus is understated. We also reviewed Fleet reports that are supposed to track warranty work and found they contained incorrect, incomplete and contradictory information with regard to start and end dates. Thus, Fleet does not have the complete and accurate information it needs to adequately monitor the status of warranty work on its vehicles.

e. Produce analyses to monitor and improve maintenance functions

Monthly maintenance performance reports and analyses produced by MCMS contain incomplete and incorrect information because of the system's limitations and the way it is currently used. The data reported is also inconsistent with the month's actual activities because of delays in entering data into MCMS. For example, emergency road crew repairs are first recorded manually, and then entered into the MCMS after delays of up to five weeks. Fleet could avoid these delays if road crews used available hand-held scanners, which are compatible with MCMS, to download repair information to MCMS from the repair site.

f. Demonstrate consistent reporting of data

The MCMS does not consistently report data from report to report due to management's lack of control over the recording of maintenance information.

g. Provide user-defined edits and exception reports

MCMS internal checks do not detect all data entry errors. In addition, FDNY officials do not request MCMS exception reports which identify entries containing inconsistent or contradictory information. Such entries, if they are detected, are not included in calculations for the monthly reports. In one example, we found that repair order out-of-service hours were left out of the calculation of monthly out-of-service statistic. As a result, this statistic was understated.

We also found numerous examples of fragmented administration and duplicated systems at FDNY. FDNY still maintains a separation between managing its firefighting apparatus and ambulance fleets (the City's Fire Department and Emergency Medical Services were separate departments until a merger in 1996), thereby duplicating some of the administrative systems and tasks. Additional staff and management time and effort is dedicated to using several separate PC-based software systems for administering fleet services activities, such as daily tracking of vehicles, scheduling preventive maintenance, tracking outside warranty work, tracking mileage and fuel consumption. As stated earlier, data for some functions, like preventive maintenance, is now entered in three different systems by different staff.

Duplicate systems and the duplicate effort used to maintain them are inefficient, difficult to manage and too complicated to monitor and coordinate. FDNY management is urged to work with DCAS to identify and resolve MCMS weaknesses and to address FDNY user concerns so the system can perform the functions it was implemented for. Once MCMS is operating as intended to maintain accurate and complete repair and maintenance data, FDNY management should gradually eliminate the duplicate recordkeeping systems. FDNY should also streamline operations by eliminating duplicate administrative tasks, to the extent feasible, to streamline operations.

Recommendations

1. Formalize policies and procedures for the FDNY's preventive maintenance activities.
2. Improve monitoring of the scheduling and actual performance of preventive maintenance.
3. Establish objectives for Fleet operations, set performance goals and define measurable performance indicators that can measure progress toward those goals. Monitor progress in achieving performance goals.
4. Establish and maintain formal, written and enforceable job standards and monitor conformance with those standards.
5. Work with DCAS to obtain and understand up-to-date written procedures for MCMS as it applies to the FDNY fleet maintenance activities.

Recommendations (Cont'd)

6. Work with DCAS to improve the utility and effectiveness of MCMS as a reliable information system for FDNY managers and staff by:
 - ! Establishing proper controls over the data input to ensure that information is accurate and complete;
 - ! Validating labor hours from work orders and recording all labor hours, including overtime, on MCMS;
 - ! Recording fuel usage and mileage on MCMS;
 - ! Scheduling and tracking preventive maintenance information on MCMS;
 - ! Using MCMS to monitor and control warranty work for all FDNY vehicles; and
 - ! Producing exception reports to note MCMS entry errors.
7. Implement the MCMS system to fully benefit from its capabilities as a management tool to effectively and efficiently monitor and manage the FDNY's fleet maintenance activities.
8. Provide periodic training in the proper use of MCMS to FDNY managers and staff.
9. Establish a schedule for phasing out duplicate PC-based and manual recordkeeping systems.

Spare Parts Inventory

The New York City Department of Investigation (DOI) has established Standards for Inventory Control and Management (Standards) to establish responsibility for, exercise control over, and account for the receipt, storage and disposition of supplies, materials and equipment, including parts inventory. In the past, New York City mayoral agency heads have “identified inventory losses as among the most serious corruption risks within their agencies” and “investigations conducted by DOI Inspectors General have disclosed significant weaknesses in some inventory operations, often resulting from failures to meet basic requirements.” We visited the two FDNY inventory locations in Queens where about 70 percent of FDNY spare parts inventories are maintained to determine whether FDNY had implemented the DOI Standards. We found that FDNY did not conform to Standards because it had not established written policies and procedures for controlling inventories, taken adequate steps to reduce stores of obsolete parts and perform unannounced inventory counts by independent parties.

Written Policies and Procedures

FDNY management is responsible for ensuring that there are policies and procedures which are kept up-to-date and include all requirements of the DOI standards. The FDNY has no written parts inventory policies and procedures for many inventory-related functions including, but not limited to: handling and returning to stock any parts not required for a repair order; monitoring, reviewing and verifying actual parts used against repair orders; relinquishing obsolete parts; doing valuations of rebuilt parts inventories; and controlling parts used by road crews. Without policies and procedures that provide for compliance with DOI Standards, there is greater risk of inefficient inventory practices, and the potential for waste and abuse of FDNY assets.

Obsolete Parts

To reduce the cost of maintaining inventories, the New York City Comptroller has recommended decreasing inventory levels and improving turnover rates. FDNY officials told us they did not agree with us the City Comptroller’s recommendation. We found that the aggregate recorded inventory value at ten of the twelve parts inventory locations we reviewed had increased almost \$1 million between June 30, 1999 and March 31, 2000. Although the FDNY had entered into a parts supply

contract on an “as needed basis” to reduce inventory levels, the effect of this contract was not yet noticeable at the time of our audit.

We believe that some of this increase in value may be attributable to FDNY’s accumulation of obsolete parts. Obsolete parts have little actual value, inflate the recorded value of inventory, cost money to maintain and take up space that could be used to store needed items. We observed parts in various stock areas that were covered with dirt and dust, and had obviously not been handled in a very long time. Some parts were stacked on the floor, blocking aisle space. The FDNY Parts Supervisor acknowledged that between one-quarter and one-third of the items in parts inventory could represent outdated items and should be surplus or salvaged.

Inventory Audits

According to DOI Standards, department management should provide for both annual and unannounced audits of the major inventory functions. These audits should be conducted by an independent internal or external audit group and reported to management in a timely manner. However, the inventory is counted by the same people who maintain the inventories. FDNY internal auditors do their own test counts at some sites just during the annual inventory process. We observed one such site inventory, where internal auditors selected and counted 50 different parts items, and compared their counts to inventory records. There were discrepancies between the physical count and inventory records for 22 (44 percent) of the 50 items they reviewed. The differences were documented and the records were adjusted to reflect quantities of parts on hand. To detect and prevent waste and abuse, inventory discrepancies should be investigated and resolved. We also found that FDNY has no controls over the parts assigned to its 22 emergency road crews. The parts inventories held by the road crews are not included in the FDNY annual inventory counts.

We also observed that several types of parts were in location recorded on the location sheet, but were stored elsewhere. This practice could lead to difficulties in locating parts when needed and in conducting inventory counts. It could result in the unnecessary purchase of parts already on hand.

Recommendation

10. Establish formal, written policies and procedures for all parts inventory functions that conform with DOI Standards. These policies and procedures should include, but not be limited to, the following action:
 - ! Take more aggressive action in identifying and salvaging obsolete parts;
 - ! Store parts in a safe and proper manner in the place designated on location records;
 - ! Perform annual and unannounced physical inventory counts, and have such counts conducted by persons independent of the inventory function; and
 - ! Include all parts in inventory counts, including those used by road crews.

(FDNY officials replied to the draft report that they have established formal written policies for all parts inventory. In addition, they have identified outdated items and decreased inventory by \$600,000 and made space available to safely store goods. They have not included the Emergency Crew Trucks in the inventory of salvage efforts due to the large backlog of each order in MCMS caused by the system's inability to automate the repair order process.)

FDNY Vehicle Inventory as of December 2000						
Vehicle Type	Number of Fire Companies	Number of Vehicles			Total Number of Vehicles	Spare Vehicle Percentage
		Active	Reserve	Spare ²		
Engines	210	222	21	56	299	25%
Ladders	143	147		30	177	20%
Total Engines & Ladders		369	21	86	476	
Rescue & Other Front-Line		22		5	27	
Subtotal	353	391	21	91	503	
Ambulances		411			411	
Support		919			919	
Total	353	1,721	21	91	1,833	
Notes : ¹ Reserve vehicles are stationed around the five boroughs to be used in case of a major disaster. ² Spare vehicles are used to temporarily replace fire company vehicles which are out of service.						

Major Contributors to This Report

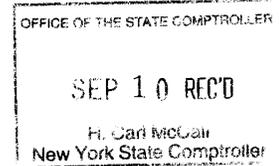
Carmen Maldonado
Stanley Evans
Roger C. Mazula
Emma Wohlberg
Carole Siegall
Jennifer Murrell
Nancy Varley



FIRE DEPARTMENT
9 METROTECH CENTER BROOKLYN, N.Y. 11201-3857

THOMAS VON ESSEN
Fire Commissioner

Suite 8W-6



September 6, 2001

H. Carl McCall
State of New York
Office of the State Comptroller
AE Smith State Office Building
Albany, New York 12236

OFFICE OF THE STATE COMPTROLLER

SEP 12 2001

**ROBERT H. ATTMORE
DEPUTY COMPTROLLER**

Dear Mr. McCall:

The Fire Department is in receipt of the audit of **Selected Vehicle Maintenance Practices (2000-N-5)**, issued on July 25, 2001. An Agency Implementation Plan is attached outlining our response to the ten recommendations listed in the report. We would also like to clarify several issues raised in the report:

- The Fire Department adheres to the New York City Office of Fleet Administration's policies on Fleet Maintenance. The FDNY also has written policy on spare vehicles, which is embodied in the replacement cycle development and schedule.
- The Department has formal mission statements for all units, and performance indicators are embodied in the Mayor's Management Reports, FDNY's Executive Management Reports, and the managerial performance evaluations. Fleet Services monitors out of service and unit availability in real time, and notifies management of those indicators at set intervals throughout the day.
- FDNY's Fleet Services prime objective is to ensure that properly maintained and serviced vehicles are available at all times to respond to emergencies. The Department's vehicle maintenance is conducted in a cost effective, efficient, and professional manner, which complements Fleet Services' achievement of its prime objective.

- Fire apparatus are custom built to FDNY specifications and therefore generic performance standards are often not applicable. The Department did not historically have the technical ability and automated computerization support levels to comprehensively record, track, and monitor discrete performance levels and project applicable work performance standards. The Maintenance Control and Management System (MCMS) coordinated by the NYC Department of Citywide Administrative Services (DCAS) is finally providing that capability, allowing FDNY to collect performance data, and implement FDNY-specific performance levels when adequate data is available for analysis. Currently, the Department's performance expectations are monitored based on experience levels, repair complexity, and vehicle specifications.

I would like to take this opportunity to thank you and your staff for the substantial investment of time and resources this report represents. The information has been useful in evaluating our progress and refining our program objectives. We look forward to working with you in the future.

Sincerely,



Thomas Von Essen
Fire Commissioner

Attachment

Agency Implementation

AUDIT # **2000-N-5**

AUDIT REPORT ISSUED: 7/25/01

AUDIT NAME: *State Comptroller Review of Vehicle Maintenance Practices*

RECOM # RECOMMENDATION

01 Formalize policies and procedures for the FDNY's preventive maintenance activities.

FDNY RESPONSE

FDNY will do this, incorporating OFA policies/manufacturers' recommendations for Fleet Maintenance into FDNY's written policies and procedures.

02 Improve monitoring of the scheduling and actual performance of preventive maintenance.

In an effort to improve FDNY vehicle preventive maintenance, Fleet Services has implemented the following procedures.

A) Fleet Services has requested that each unit within the Fire Department name one individual as the Vehicle Coordinator for their respective unit.

B) Fleet Services has also appointed a Preventive Maintenance Schedule Coordinator to insure schedule compliance.

C) Each PM location is required to notify the PM Schedule Coordinator of any vehicle that has not shown up as scheduled.

D) A monthly report is run for any vehicle that fails to show up or reschedules their PM. A copy of this report is sent to the unit heads requesting that action be taken to insure the vehicle operators comply with the PM schedule.

03 Establish objectives for Fleet operations, set performance goals and define measurable performance indicators that can measure progress toward those goals. Monitor progress in achieving performance goals.

MCMS is currently capturing data on Fleet operations. Use of this growing database will allow FDNY to expand management reporting and monitoring of performance indicators for achieving FDNY goals.

Wednesday, September 05, 2001

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04	<p>Establish and maintain formal, written and enforceable job standards and monitor conformance with those standards.</p>	<p>A job standards study was conducted in 1994 and is still applicable as a general guide. These guidelines will be reviewed and updated on a periodic basis, and conformance with these standards will be monitored.</p>
05	<p>Work with DCAS to establish and maintain up-to-date written procedures for MCMS as it applies to the FDNY fleet maintenance activities.</p>	<p>The FDNY has obtained written procedures and enhancements made to MCMS and will train its staff on their use.</p>
06	<p>Work with DCAS to resolve MCMS weaknesses and improve the utility and effectiveness of MCMS as a reliable information system for FDNY managers and staff by:</p> <p>A) Establishing proper controls over the data input to ensure that information is accurate and complete;</p> <p>B) Validating labor hours from work orders and recording all labor hours, including overtime on MCMS;</p> <p>C) Recording fuel usage and mileage on MCMS;</p> <p>D) Scheduling and tracking preventive maintenance information on MCMS;</p> <p>E) Using MCMS to monitor and control warranty work for all FDNY vehicles; and</p> <p>F) Producing exception reports to note MCMS entry errors.</p>	<p>A) FDNY has requested that DCAS investigate programming changes that will provide "flag alerts" when illogical information is entered into MCMS. DCAS and Control Software have already developed one flag that will not allow creating Repair Orders Dates that have not yet occurred. A committee will be formed to discuss further development of such "flags" as well as future modifications to MCMS.</p> <p>B) MCMS incorporates the overtime into a burdened labor rate, which makes the data much easier to track and enter at the point of data entry.</p> <p>C) Fleet Services does capture correct mileage at all repair locations, however, there is no interface between MCMS and the present dispensing/gas card system.</p> <p>D) DCAS has turned on a Preventive Maintenance module and it is being examined and tested for use by FDNY.</p> <p>E) MCMS has the capability of recording and tracking warranty information and is being integrated into Fleet's operational processes.</p> <p>F) Additional training is needed in the use of MCMS so that management can use the system to its full potential, I.E. exception reports. Fleet will work with DCAS to obtain this training. (see #8)</p>
07	<p>Implement the MCMS system to fully benefit from its capabilities as a management tool to effectively and efficiently monitor and manage the FDNY's fleet maintenance activities.</p>	<p>FDNY will add on new modules to the MCMS system as they become available, and train personnel in their use.</p>

08	Provide adequate training in the proper use of MCMS to FDNY managers and staff.	DCAS is providing additional MCMS classroom training as well as training on new MCMS modules and functionality.
09	Establish a schedule for phasing out duplicate PC-based and manual Record keeping systems.	The Department is still in the process of integrating the MCMS system into the Fleet operation. As MCMS can absorb peripheral software applications, stand alone applications are being phased out.
10	<p>Establish formal, written policies and procedures for all parts inventory functions that conform with DOI Standards. These policies and procedures should include, but not be limited to, the following action:</p> <p>A) Take more aggressive action in identifying and salvaging obsolete parts;</p> <p>B) Store parts in a safe and proper manner in the place designated on location records;</p> <p>C) Perform annual and unannounced physical inventory counts, and have such counts conducted by persons independent of the inventory function, and</p> <p>D) Include all parts in inventory counts, including those used by road crews.</p>	<p>Fleet Services has established formal, written policies for all parts inventory functions. These policies include Parts Room responsibilities, ordering/purchasing procedure, receiving procedure, storage procedure, issuing procedure, security of Parts Room and test count of inventory and adjustments. Each Parts Room employee has a copy of these procedures, understands the procedures, and abides by them.</p> <p>A & B) Fleet services has taken an aggressive action to identify outdated items and have reduced stock in all inventory locations except for the Emergency Crew Trucks. To date Fleet Services has decreased our inventory by \$600,000 and made use of these available space to safely store goods. The Parts Room supervisor at each location will continue to identify obsolete parts, prepare the parts for salvage, and use the storage space to our advantage. In addition, Fleet Services has entered into a parts supply contract, which has reduced inventory levels by supplying parts on an "as needed basis".</p> <p>C) Fleet Services follows the DOI standards where staffing allows, and in order to tighten out inventory procedures we requested an inventory control team, but the funding for the additional personnel has not been allocated.</p> <p>D) The Emergency Crew Trucks have not been included in either inventory of salvage efforts due to the large backlog of each order in MCMS caused by the system's inability to automate the repair order process. Fleet Services supervisors have made progress in reducing the backlog orders for the crew trucks, we will inventory the trucks, identify the obsolete parts and salvage those parts.</p>