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Los Angeles City Fire Department:

The City Can Do More to Enhance the Safety and Effectiveness of Its Air Operations Unit

November 1999
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CALIFORNIA STATE AUDITOR

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November 18, 1999 99119

The Governor of California
President pro Tempore of the Senate
Speaker of the Assembly
State Capitol
Sacramento, California 95814

Dear Governor and Legislative Leaders:

As requested by the Joint Legislative Audit Committee, the Bureau of State Audits presents its audit report concerning the Los Angeles City Fire Department's (department) adequacy of safety policies and procedures of its air operations.

This report concludes that the department has made changes to improve the safety and effectiveness of its air operations. However, although some of the department's staffing policies may save money, they diminish the effectiveness of its air operations. Further, the department underemphasizes training and other safety issues. Finally, the department lacks a formal helicopter replacement policy to ensure that it has helicopters that meet the specific needs of its varied missions.

Respectfully submitted,

KURT R. SJOBERG
State Auditor

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SUMMARY

Audit Highlights . . .

We found several areas of concern during our review of the Los Angeles City Fire Department's aviation safety procedures. Specifically, we noted:

- ☑ *An inconsistent simulator training policy.*
- ☑ *No formal periodic flight safety training program.*
- ☑ *An ongoing aviation operation without a formal helicopter replacement policy approved by the city.*

We also noted, however, that the fire department has taken several steps to improve its operations. Specifically, it has:

- ☑ *Replaced the helicopters involved in three recent accidents.*
- ☑ *Reinitiated annual simulator training for those pilots qualified in the Bell 412.*
- ☑ *Prepared to station paramedics at the air operations unit effective January 2000.*
- ☑ *Relocated its operating facility for safer approaches and departures.*

RESULTS IN BRIEF

The recent crashes of three Los Angeles City Fire Department (department) helicopters have prompted concerns about the safety of its helicopter operations and compelled the Legislature to request this audit. Legislators wanted to know whether the department's policies and procedures governing the use of its helicopters compare favorably to similar operations at other agencies, whether it properly trains its aircrews, and whether the air operations (air ops) unit has an adequate safety program.

The National Transportation Safety Board is still investigating the causes of two of these crashes—one of which killed four people—therefore, we cannot conclude on that issue. We have found aspects of the department's helicopter operations where safety is a concern, however, particularly in the department's staffing and training policies. The department has attempted to save on personnel costs by assigning new pilots, aircrew support personnel (helitacs), and paramedics to ground fire stations. The air ops unit should be these aircrew members' primary assignment, yet they only serve the air ops unit on an on-call basis. As a result of this "doubling up" of assignments, new pilots find their training opportunities are restricted. Similarly, paramedics and helitacs get only limited training with air ops and its pilots. Limited training opportunities may increase the underlying operational risk for all aircrew personnel. New pilots face a further disadvantage because their part-time availability to air ops prolongs the time it takes for them to acquire sufficient flight hours to upgrade into the unit's primary aircraft, the Bell 412.

Delays are another serious problem resulting from the department's staffing methods. Air ops missions can be delayed from 3 to 10 minutes because the flights must wait for aircrew members to arrive from other locations. By January 2000, the department plans to partially resolve this issue by assigning paramedics to the air ops facility on a full-time basis; however, it must still address staffing for new pilots and helitacs.

By modifying its staffing of air ops commanders as well as of its aircrew members, the department could enhance its effectiveness and help reduce its operational risk. The department currently

limits the air ops commander to a two-year assignment and does not staff a chief pilot position. The commanders' relatively short tenures causes them to focus on short-term issues at the expense of policy development and continuity that could contribute to long-term stability and effectiveness in the unit's operations. Additionally, although a trained firefighter, the commander is not a pilot and is not familiar with aviation operations. Consequently, it takes the designee considerable time to become familiar with the particulars of running an aviation unit. The unit's administration could be helped considerably if the department would also appoint a chief pilot to assist the commander and to serve as the final point of command for flight operations.

Another area of concern is related to the department not consistently funding training for its helicopter pilots. Although it reinstituted simulator training, a standard industry practice, in 1998, the department did not fund this training from 1993 through 1997. The air ops unit should also establish a formal training program for its pilots with regularly scheduled flight safety meetings. While the training program for pilot trainees at air ops is intense, the recurring training program for its graduates provides significantly fewer activities and opportunities for them to continue developing their skills. A more intensive regular training program including ground simulators, classroom courses, and periodic flight-safety meetings would be a positive step in minimizing the risk inherent in all aviation operations.

In addition, the lack of a helicopter replacement policy may further affect the overall safety of the air ops unit. The department's older helicopters are at times less effective in meeting its various missions and create an increasing maintenance burden. Older helicopters lack the new technology and safety equipment to reduce some of the department's risk in performing its missions of fire suppression, air ambulance, and search and rescue. In addition, older helicopters' maintenance costs increase significantly. A long-term replacement policy would allow the department to plan to retire older aircraft that less effectively meet its needs.

The department is attempting to remedy some of the problems that compromise the safety of its helicopter operations. Following the second helicopter crash in March 1998, it commissioned a comprehensive assessment of its air operations activities. Based on this review and numerous recommendations from outside entities, the department has improved some aspects of its air

operations. It has resumed simulator training, purchased three replacement helicopters, and revised its staffing policy for paramedics. In addition, air ops aircraft began operating at its new temporary facility. This relocation eliminated its previously restricted departure and approach routes and significantly improved the safety of both. Many of the recommendations we are making are also included in the department's own internal study of its aviation operation.

RECOMMENDATIONS

The department should take these steps:

- Review and revise its staffing policies and patterns to permit all aircrew members to be stationed at the air ops unit.

- Require the air ops unit to review and formalize its policies to ensure it has standard operational guidelines; clear lines of operational authority and responsibility; and a formal, regularly scheduled flight safety program.

- Implement a helicopter replacement program to ensure that helicopters are replaced when they are no longer economical to maintain or become inappropriate for the department's needs.

AGENCY COMMENTS

The department concurred with all our recommendations. However, the department felt that we either did not sufficiently emphasize or omitted certain issues which they consider critical for improving the operational capabilities and effectiveness of its air ops unit. Specifically, the department believes that its recent efforts to remedy some of the deficiencies of its aviation operation and the poor condition of the facility currently being replaced by a new temporary facility should receive additional acknowledgment.

The Los Angeles City Department of General Services that maintains the city's air fleet agreed with our comments. Additionally, it expressed concern that the inadequacies of the maintenance and repair facility will be compounded as the city adds larger, multi-bladed helicopters to its fleet. ■

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INTRODUCTION

BACKGROUND

In serving a population of three million people over an area of 464.5 square miles, the 3,000 firefighters of the Los Angeles City Fire Department (department) fight many types of fires, from blazes in large industrial structures to kitchen fires in single-family dwellings to oil tanker explosions or hillside brush fires. The department's air operations (air ops) unit is also responsible for aerial fire suppression, search and rescue, emergency medical transportation, and aerial reconnaissance and control. The department's commanding officer is the chief engineer and general manager, who reports to the Board of Fire Commissioners, a five-person civilian board appointed by the mayor. The air ops unit is funded by the city's general fund. Its annual budget for fiscal year 1997-98 was $2.9 million, or approximately 1 percent of the department's total budget of $305 million.

The department's fleet consists of six helicopters: two Bell model 206s and four Bell model 412s. The Bell 206, a small 4-passenger helicopter, is used for training new pilots and for aerial reconnaissance and airborne control and command at fires and other emergencies. The Bell 412, a medium-sized, 14-passenger helicopter, is used as an air ambulance as well as for search and rescue and to drop water on fires.

Air ops crews consist of 12 pilots, as well as 36 aircrew support personnel (helitacs) and available paramedics who are assigned to nearby fire stations. The pilots have overall command of all air operations while helitacs assist aerial operations by loading water during wildfires, conducting hoist and recovery operations during aerial rescues, and serving as safety observers during all helicopter operations. The paramedics care for patients until they get to the hospital.

The fleet services division of the Los Angeles City Department of General Services (DGS) maintains the city's helicopters, including those of the fire and police departments and the Department of Water and Power. Maintenance funding is included directly in DGS's budget from the city. Maintenance activities are provided to the police and fire departments at no cost, however the Department of Water and Power is billed for the maintenance of its helicopters.

In 1989, DGS requested that a consultant review fleet services' operations. The consultant noted a lack of quality control and inspections of aircraft. Specifically, fleet services' automated tracking system was inadequate to track required scheduled maintenance. In addition, fleet services was not completing maintenance records in accordance with Federal Aviation Regulations, which could have resulted in the forfeiture of an aircraft's Certificate of Airworthiness. Fleet services also did not control serialized component parts, increasing the possibility that old or broken components could be mistakenly installed in an aircraft.

Fleet services has since remedied these shortcomings and has evolved into a well-managed helicopter repair station. To improve its quality control, fleet services developed a procedures manual in compliance with Federal Aviation Administration (FAA) guidelines and implemented a quality assurance program to ensure its mechanics made inspections in accordance with FAA procedures. In 1992, it became an FAA-certified repair station. Reviews in 1993 and 1998 by the Associated Aviation Underwriters (AAU), which insures the city against the risk of liability for its aircraft, reported that fleet services' quality control program ensured that helicopter repairs are maintained in accordance with FAA regulations and manufacturers' standards. The AAU also reviewed training, condition of shop tools and equipment, and inspection and documentation of all maintenance work performed.

As an FAA-certified repair station, fleet services is now subject to FAA's spot inspections at any time. These inspections review the adequacy of the repair station inspection system, records, and compliance with federal aviation regulations. Following these inspections, the FAA notifies the repair station in writing of any defects. For example, in July 1998, the FAA inspection found that minor changes were needed in fleet services' inspection procedures manual. Fleet services made the changes and during the next inspection, the FAA concurred that the problem was resolved.

Department Helicopter Accidents

During a 10-month period beginning in March 1998, three of the air ops unit's helicopters were destroyed in crashes. One accident resulted in the loss of four lives. The National Transportation Safety Board (NTSB) has yet to issue final accident reports for two of these crashes. However, since these accidents, numerous reviews of the department's air operations have been completed.

The department itself commissioned its Air Operations Workgroup and Air Operations Committee to study its operation. The department's "Air Operations Final Report," which resulted from this study, is an in-depth assessment detailing numerous recommendations for improving air operations.

SCOPE AND METHODOLOGY

The Joint Legislative Audit Committee asked the Bureau of State Audits to perform an audit of the Los Angeles City Fire Department's safety programs and procedures for its helicopters and compare its operation with that of two similar agencies. The Legislature was concerned about how the department uses its helicopters, whether staff are properly qualified or trained, and whether the department has an adequate safety program.

To understand the department's air operations, we interviewed the department's management, pilots, and helicopter crew members. We also interviewed mechanics from DGS's fleet services. To obtain an understanding of the air ops unit's procedures, we interviewed personnel from similar units at the Los Angeles Police Department, California Department of Forestry and Fire Protection, Los Angeles County Fire Department, Ventura Sheriff's Department, and San Bernardino Sheriff's Department. Furthermore, we observed several city air ops missions as they were dispatched to determine whether response time was increased if aircrews were stationed elsewhere.

We reviewed the department's "Air Operations Final Report" to determine what problems it identified and its proposed recommendations. We took special note of those recommendations identified as critical priorities requiring immediate attention and resolution. We reviewed the relevant industry best practices and compared those with the practices of the agencies we visited, including the department. We also reviewed surveys or inspections conducted by the AAU in 1989, 1993, and 1998.

We examined previous department budgets and associated records of expenditures to gauge the consistency with which the department has supported training and equipment needed as part of the overall effort to minimize the operational risk of aviation activities.

We also obtained operating and replacement cost information from an aviation consultant for both helicopter models air ops owns. We compared the department's capital-expenditure practices with those of the other agencies we visited to better understand how various agencies were able to make large capital expenditures to replace and upgrade their helicopters.

Finally, we reviewed the steps that the department is taking to improve its air operations and identified areas where the department must take additional action to achieve its goal of becoming one of the country's top and finest aviation units. ■

AUDIT RESULTS

The City Can Do More in Staffing, Training, and Providing Equipment to Enhance the Safety and Effectiveness of Its Air Operations Unit

SUMMARY

The Los Angeles City Fire Department (department) recently established the goal of making its air operations (air ops) unit one of the finest emergency and rescue organizations in the country. To further this goal, the city and department have recently revised policies and allocated funds to help reduce the operational risk of the aviation unit. To reach this goal, however, the department could do more.

The department's staffing policies for the air ops unit hinder training opportunities for its personnel as well as the unit's overall operational efficiency. Its policy of assigning aircrew support personnel (helitacs) and new pilots to ground fire stations on a part-time basis and its policy of sending paramedics to air ops only on an on-call basis has lengthened its response time to emergencies. It has also limited the time new pilots are available for training and for accumulating flight hours. Effective January 2000, paramedics will be stationed at the air ops unit; in addition, as of November 1999, the pilots currently assigned to fire station 90 have been assigned full time to air ops. The department has also proposed that new pilots be stationed full time at air ops and initially trained as the primary helitac. Helitac support for additional missions before the first mission has recovered would still be supported by helitacs from fire station 90 as is done now.

Management staffing is problematic as well. The department limits the tenure of each air ops commander to about a two-year term, which makes it more difficult for the commander to design long-term policies to improve the department's overall operations or its staffing policies. The unit also lacks a chief pilot to serve as a single point of command over flying operations and to assist the commander.

The department is now addressing inconsistencies in ongoing training for its aircrew members, yet some areas still need attention. The department recently resumed flight simulator training for its pilots, which it had suspended for five years. However, it does not hold regularly scheduled flight safety training meetings. Both types of training are standard for the industry and serve to reduce the operational risk of aviation units.

The unit also does not consistently enforce all administrative policies for flight operations. Aircrews are briefed on temporary operational hazards or operating restrictions, for example, but air ops does not effectively document that all its pilots have received such information. Air ops also has not developed a formal operations and training procedures manual, although one is currently being prepared.

If the department is to minimize overall risk for its aviation operations, it must effectively ensure proper aircraft maintenance, provide appropriate equipment for its missions, and enforce stringent training and operational procedures.

THE CITY HAS ACTED TO MINIMIZE ITS RISK, BUT MORE CAN BE DONE

Risk is best mitigated through excellent equipment, maintenance, and training.

For the past year and a half, the city has taken significant steps to reduce the operating risk inherent in all aviation operations. The aviation operations within the department are performed in a stressful and demanding environment where deviations from normal flight parameters, unexpected occurrences, or aircraft system malfunctions can result in significant or catastrophic consequences. Even though risk cannot be entirely eliminated from aviation operations, risk is best mitigated through excellent equipment, maintenance, and training. Training crews to the highest standards and providing them with good equipment gives them the tools and judgment to handle whatever circumstances they may encounter on emergency missions.

To reduce this risk for the air ops unit, the department has recently taken several steps to improve overall safety for its pilots and aircrew members. During 1998, all air ops pilots flying the Bell 412 completed specialized academic and simulator training. Additionally, along with the pilots, the majority of the helitacs and paramedics have completed water crash survival training. Furthermore, the department replaced its damaged Bell 206 and obtained two Bell 412s for the two Bell 205s destroyed in

accidents. In October 1999, air ops aircraft began operating at its new temporary site. This relocation eliminated its previously restricted departure and approach routes and significantly improved the safety of both. Finally, 30 paramedics have received six hours of aeromedical orientation training. However, the department still has additional tasks to complete to further reduce occupational risk for its aircrews and to ensure it reaches its goal of having one of the best air ops units in the country.

THE DEPARTMENT'S STAFFING POLICIES SAVES MONEY BUT DIMINISHES THE EFFECTIVENESS OF AIR OPERATIONS

The department's practice of assigning air ops personnel to ground stations saves it money but hampers its pilots and support crews in maintaining their professional competency and responding quickly to emergency dispatches. Currently, the department assigns new pilots to air ops only on a part-time basis. The pilots spend the rest of their time with ground fire stations. Helitacs and paramedics are also stationed with ground fire units. The department has proposed that new pilots be assigned full time to air ops and initially trained as helitacs.

Sharing staff between fire station 90 and air ops limits their training opportunities. It also puts new pilots at increased risk during ground fire emergencies because they do not receive all the fire-suppression training for fighting ground fires that is available to ground firefighters. Moreover, it causes flight delays because the air ops unit must wait for helitacs and paramedics to arrive from fire stations or ground emergencies before it can respond crews to emergencies requiring aerial equipment.

The department's policy of limiting the air ops commander position to two years also hinders the efficiency of the air ops unit. The commander position is filled from the ranks of the ground firefighters, so the commander needs considerable time to become familiar with aviation operations. Also, if the department appointed a chief pilot, this person could assist the commander in learning about aviation operations and provide a central point of command for flight operations.

Air Ops Shares New Pilots With a Ground Fire Station

The department assigns its newly trained pilots to a nearby ground fire station, fire station 90, as regular firefighters, only allowing the new pilots to train or fly with air ops on a part-time basis. By assigning pilots to fill positions at a ground fire station and only cover air ops duties on a part-time basis, the department limits the number of personnel needed and thus saves money. The department considers these pilots to be trainees although they are qualified to pilot the Bell 206 unaccompanied and could therefore drop water during large fire operations if air ops chose to use the Bell 206 in that manner. They are not yet, however, qualified to pilot the Bell 412. When these pilots request to fly or train with air ops, the department usually pays another firefighter overtime to fill in for them at the station. When a backup cannot be found, the pilot is not usually released to air ops. We will continue to refer to these trainees as new pilots in this report.

A special report found that hiring staff to serve both a ground fire station and air operations diminishes the effectiveness and safety of both.

Following the helicopter crash in March 1998, the department's chief engineer and general manager commissioned a study to assess its aviation activities. The "Air Operations Final Report," which summarizes the findings from this study, pointed out that hiring staff to serve both the ground fire station and air ops diminishes the operational efficiency, effectiveness, and safety of both air ops and the ground fire station. For example, we interviewed a new pilot assigned to fire station 90 who was unable to train or fly with air ops because the fire station could not release him without compromising its ability to respond to emergencies.

Pilots and ground firefighters with the department expressed concern that new pilots face increased occupational risk and stress because they must maintain both ground fire fighting and flying skills. Additionally, because they are trained primarily as pilots, they receive less training in fire suppression than other personnel do, which increases their occupational risk. It is important to note that none of the other fire or police air operations we visited had similar staffing policies.

In its two operational reviews of the department over the past decade, the Associated Aviation Underwriters (AAU) recommended that the department should, to the maximum extent possible, assign pilots and crew members to the air ops unit on a full-time basis. The department's "Air Operations Final Report" also lists discontinuing part-time assignments for pilots as a

critical priority. The report noted that it costs from $300,000 to $400,000, and takes four to five years for pilots to become fully certified for all the department's missions. In light of this sizable investment, the department and city can reduce risk by assigning newly trained pilots to the air ops unit on a full-time basis.

The Department Assigns Aircrews to Ground Fire Stations Instead of to Air Ops

Likewise, the department also assigns its helitacs and paramedics to ground fire stations to reduce its personnel costs. Helitacs fly on all air ops missions and are important to the unit's operations. They service and fuel the aircraft, load water for fire suppression missions, and operate the hoist for recovering injured, trapped, or distressed individuals. To avoid hiring more full-time firefighters, the department assigns helitacs to fire station 90 while keeping them on call for air ops missions. Because this fire station is located on the opposite side of the airport runway, it usually takes helitacs about three to five

FIGURE 1

Location of Fire Stations With Air Operations Paramedics

minutes to reach the air ops unit; however, this time is increased if they have already been sent to a fire or other emergency at the time air ops is dispatched to a mission.

Paramedics are also part of the air ops unit's missions. They fly with the air ambulance, as required by Los Angeles County Department of Health Services (DHS) regulations, and serve as crew members on aerial-hoist rescue missions. They are normally assigned to one of five fire stations located near the air ops unit to serve as the fire station's rescue ambulance crew. When they are needed for air ops missions, the department's central dispatch determines which rescue crews are available. The Los Angeles County Fire Department has a similar air ambulance function outside the City of Los Angeles. All the paramedics stationed with the county's aviation unit are trained as helitacs. The Los Angeles County Fire Department's staffing configuration for each aircrew—one pilot is assisted by two additional crew members who serve as both helitacs and paramedics—is similar to the crew configuration the department proposes to use next year for its air ops unit.

By assigning air ops paramedics to serve primarily at ground fire stations, the department again reduces its personnel costs, but cutting corners in this manner negatively affects the air ambulance service. Air ambulances must wait an extra 5 to 10 minutes for paramedics to arrive. These delays reduce the efficiency of the air ambulance program by increasing the total response time to emergencies.

By comparison, the goal of the Life Flight air ambulance service with the University of California at Davis Medical Center is to have its helicopters airborne within about 5 minutes of dispatch. To determine the time it takes for the air ops ambulances to be airborne, we discussed response times with air ops pilots and observed three missions. The pilots indicated helitacs routinely arrive at the aircraft after the preflight check and engine start. According to the "Air Operations Final Report," helitacs usually arrive within 3 to 5 minutes of dispatch while paramedics routinely take up to 10 minutes. We confirmed this information when we observed the dispatch and departure of three air ambulance missions. Paramedics delayed two of the missions by an additional 4 and 6 minutes, respectively. In the third case, the air ambulance waited 4 minutes for paramedics and an additional 5 minutes for the helitac to arrive from a ground emergency.

Paramedics routinely take up to 10 minutes to reach the air ambulance after its initial dispatch.

The practice of assigning aircrew members to ground fire stations further reduces the aircrews' efficiency and effectiveness because it restricts the opportunity for the crews to plan for and discuss specific missions, called prebriefing, or discuss unexpected critical situations. Such planning, standard practice for most aviation organizations, helps the crews to be more prepared for the many different emergencies they may encounter and enables them to do some team building. The department's current staffing arrangement for helitacs and paramedics restricts both prebriefing time and team development opportunities.

The national Association of Air Medical Services, a professional organization for air ambulance services, specifies in its standards that, to ensure timely response, all medical personnel must be assigned to the air medical service as their primary responsibility. This standard is intended to assure the quality of patient care and the safety of the patients, air medical personnel, and pilots. Indeed, the department is now in the process of remedying the delays caused by waiting for paramedics. According to the air ops commander, the department and the DHS are currently revising DHS regulations to require that paramedics be stationed with the air ambulance. These revisions should be in force as of January 2000 when air ops moves into its temporary facility. The new facility has accommodations for additional personnel, such as paramedics and helitacs. The department intends to station paramedics at the air ops facility and to assign backup paramedics to nearby fire station 90. Paramedics will provide dedicated support for air ambulance missions and backup paramedics will be available from fire station 90 in case two air ambulances are needed during the same time period.

Short-term commander assignments result in a lack of familiarity with aviation operations, thus limiting their ability to formulate and maintain flight programs.

Limiting the Air Operations Commander to a Short-Term, Special-Duty Assignment Affects the Continuity and Efficiency of This Unit

The department's policy of assigning a commanding officer to the air ops unit for a limited two-year term may reduce the effectiveness of this position and hinder long-term planning for the unit. Additionally, because air ops commanders are trained firefighters and not trained aviation personnel, they are not familiar with the many regulations and procedures unique to air operations.

We recognize the department's rationale for having an air ops commander who is not a trained aviator. As the unit administrator, the commander is responsible for nonflying tasks, such as

Previous operational reviews by the city's insurer have criticized the department's limited-term assignment policy for the air ops commander.

personnel scheduling, timekeeping, and ensuring the availability of necessary supplies. In the broader perspective, the commander must also evaluate the sufficiency of the unit's equipment, training, and material needs, and prepare its annual budgetary requests with supporting justification. Nevertheless, the overall effectiveness of new commanders is reduced because they only serve in the position for a short time. Their resulting lack of familiarity with aviation operations limits their ability to formulate and maintain programs and policies that directly affect flight operations. In its 1989 and 1998 operational reviews, the AAU criticized the department's limited-term policy as well.

The current air ops commander identified several further weaknesses in the department's assignment policy for the air ops commander position. Newly selected air ops commanders are drawn from the department's ground fire stations. Because they have risen through the ranks, they are familiar with the standardized office and administrative policies and procedures of those stations. In contrast, essentially none of the air ops policies and procedures is standardized. Managing ongoing emergency situations at air ops is dynamic and variable. For instance, the air ops commander may be involved in any of the following tasks:

- Monitoring pilots' flight time during major fire operations to ensure they do not exceed four to five hours of continuous flight time without a break. For major fires requiring extended aerial fire suppression, the air ops commander may need to schedule and recall off-duty pilots to provide rested pilots while ensuring that other air ops pilots are available for the following shift.

- Determining when to request or activate mutual aid agreements with other regional emergency aviation units.

- Coordinating with private contractors to dispatch fuel trucks to remote helispots as emergency situations unfold. (Helispots are dispersed landing sites where helicopters can be serviced with fuel and water.)

- Coordinating with the Department of Water and Power when necessary to obtain access to water sources normally restricted for drinking water.

These duties during a major fire operation are unique to air ops and a new air ops commander would have little experience in dealing with them. Occasions may arise when the aircrews are all airborne during a major fire operation that the commander must make these decisions without advice from other more experienced air ops personnel. These situations may increase the operational risk for the air ops unit.

The Department Has Not Staffed a Single Point of Command Over Flying Operations

In a related personnel issue, the department has not addressed the need for a single point of command over flying operations. A chief pilot would be strategically placed to coordinate training between the three platoons manning air ops and to facilitate an overall flying safety program for its pilots, but the department does not currently fund this position. The recommendations in the "Air Operations Final Report" identified the staffing of a chief pilot position as a critical priority, and the AAU recommends staffing this position as well. The chief pilot would enhance unit cohesiveness, standardization of procedures, and operational safety. The chief pilot could also serve as an additional pilot during major fire emergencies and provide invaluable assistance to the air ops commander. The department's "Air Operations Final Report" contains a survey of 11 other operational aviation units to establish appropriate benchmarks of organizational activity and standards. It reported that 9 of the 11 agencies staffed chief pilot positions, although that number has since declined to 8.

THE DEPARTMENT AND AIR OPS HAVE UNDEREMPHASIZED RECURRING FLYING SAFETY TRAINING AND MUST ADDRESS OTHER SAFETY ISSUES

"[Even] with tremendous strides in the reliability and durability of airframes and major components, the percentage of accidents due to pilot error remains high."

—Director of Safety and Flight Operations, Helicopter Association International

An ongoing training program, coupled with a regularly scheduled, formal flying-safety program, is an effective way for the department and air ops to help minimize operational risk. Periodic emergency and systems-procedures training completed in the ground simulator as well as in the classroom improves the proficiency, confidence, and judgment of aircrew members—particularly if this training is reinforced through regularly scheduled flight safety meetings. Pilots and aircrews must be constantly aware of the effort needed to achieve the safest operational results with minimal operational risk.

The need for a continual emphasis on training to improve the judgment of pilots and aircrew members is highlighted by the director of Safety and Flight Operations with the Helicopter Association International (HAI), a professional trade organization dedicated to safe and efficient helicopter operation. He stated, "[Even] with tremendous strides in the reliability and durability of airframes and major components, the percentage of accidents due to pilot error remains high. Since the mid-1980s, when safety statistics were significantly improved, pilot error has accounted for approximately two-thirds of all accidents."

The Department Did Not Fund Flight Simulator Training From 1993 Through 1997

Although the department sent its Bell 412 pilots to specialized ground instruction and simulator training as late as fiscal year 1992-93, it discontinued funding for this training from that time through 1997. By canceling the training during this period, the department was able to save an average of $103,000 annually; however, restricting critical training for its pilots may have increased the unit's overall mission risk. The department has since resumed this training.

Simulator training provides experience for in-flight emergencies which cannot be practiced in an airborne helicopter.

Simulator training is recognized as a standard practice within the industry because it gives pilots invaluable hands-on experience for in-flight emergencies and system failures, which cannot be practiced in a real, airborne helicopter. The Los Angeles County Fire Department was the only other agency we visited that uses Bell 412s. The county provides its pilots with simulator training through FlightSafety International every other year. The pilots alternate each year between simulator training at FlightSafety's facility and training given by another outside expert instructor. In its last cycle, the county brought in an expert in mountain flying.

FlightSafety International is the only entity to offer advanced simulator training for the Bell 412. Before pilots can attend the simulator training modules, they receive academic instruction in performance, flight planning, and crew management, and attend classes on all aircraft systems. During the simulator modules, pilots receive hands-on training to reinforce both normal and emergency procedures that were first covered in ground school. During the final simulator mission, the pilot must demonstrate proficiency in all maneuvers and procedures.

Simulator training is costly. A 12-day initial training course currently costs about $15,000 per pilot, plus associated costs of $2,200 for food, lodging, and travel. The 4-day recurring pilot training course is approximately $7,000, with associated costs of about $1,100. The department saved an average of $103,000 annually by canceling the training for the five-year period; however, beginning in the summer of 1998, the department resumed simulator training with FlightSafety International and sent all its pilots qualified in the Bell 412, or upgrading to the Bell 412, to the appropriate pilot training course.

The Department Needs a Formal Flying Safety Program

Another area in need of attention by the department and air ops is recurring flight safety training. Recent national safety statistics, based on Preliminary Accident Reports from the National Transportation Safety Board, identify 175 helicopter accidents in 1996, which is approximately the 10-year accident average. Included in this number are 31 accidents resulting in 51 fatalities and 33 serious injuries. After analyzing these 1996 accident reports, HAI concluded the following:

- Of the 175 accidents, 85 were most certainly a result of pilot error.
- Sixty-three accidents were precipitated by mechanical malfunctions, including 28 incidents involving either a partial or complete loss of engine power.
- In 23 accidents involving mechanical malfunctions, primary damage to the aircraft was caused not by the malfunction, but during the subsequent emergency landing when the pilot landed hard, the aircraft struck objects, or the aircraft rolled over on touchdown.

Since the mid-1980s, pilot error has accounted for approximately two-thirds of all accidents. HAI contends that virtually all of the accidents due to pilot error could possibly have been avoided with better training, greater situational awareness, and more alertness to the human factors contributing to accidents. In the opinion of HAI, pilot attitudes, abilities, professional knowledge, and skill levels can be easily influenced with aggressive safety and training programs.

Air Ops Does Not Have Regularly Scheduled Flight Safety Meetings for Its Aircrews

One of the best ways to encourage accident avoidance is through recurrent flight safety training; therefore, air ops should establish a formal safety program of regularly scheduled flight safety meetings for its pilots and aircrews. The director of Safety and Flight Operations with HAI, a professional trade association, stated in a recent "Safety and Flight Ops" article from *ROTOR Magazine,* an industry trade magazine: "With recurrent training and positive indoctrination, such as [crew management] training, pilots are reinforced in their knowledge of how to fly safely and conservatively. They develop habits that help avoid situations that could result in otherwise preventable accidents. It is imperative for safety to begin at the top. CEOs, directors of operations and chief pilots are the ones who set the tone for safety. Safety is not just a once-a-year item of the annual safety audit; it is a way of life."

Despite the department's demanding training of new pilots, the unit still has no regularly scheduled formal flight safety meetings designed to meet the needs of the entire unit. Pilots beyond the trainee stage are left with only periodic discussions of safety issues on an as-needed basis. Furthermore, because the department's new pilots generally start with fewer flight hours than those of the other agencies we visited, the department should be aggressive in its initial and recurring flight safety training.

Despite demanding training for new pilots, the unit still has no regularly scheduled formal flight safety meetings.

Regular safety meetings are standard practice at other units we visited. The necessity for regular and rigorous flight training at the air ops unit is accentuated by the lower prerequisite minimum flight hours for the department's pilot trainees compared to those of the other aviation units we visited. The program as envisioned since the accidents will begin training pilots with the Bell 206B. The pilots will then advance to the Bell 206L. Air ops anticipates that pilots will now spend about 300 hours in the Bell 206 models. Once they demonstrate proficiency with the Bell 206 models, the pilots upgrade to the next series by completing the simulator training for the Bell 412 at Flight Safety International.

The department has four minimum entrance prerequisites for helicopter pilot trainees: at least four years' experience as a firefighter with the department, a valid commercial rotorcraft rating, a class 1 or 2 Federal Aviation Administration (FAA)

Medical Certificate, and at least 500 hours of flight time (fixed wing or rotorcraft). Air ops does not, however, schedule formal periodic flight safety meetings. In contrast, although the San Bernardino Sheriff's air ops unit generally hires new pilots with twice as much flight experience (a minimum of 1,000 hours), it schedules formal flight safety meetings every two to three months. In addition, the Los Angeles County Fire Department's air ops unit conducts quarterly flight safety meetings. This department's entrance prerequisites are a minimum of 4,000 hours flight time, including at least 1,000 hours of mountain time at altitudes above 5,000 feet.

Air Ops Has No Formal Operations and Training Procedures Manual

The prerequisite flight experience for the department's pilots is less than other air operations units we surveyed.

When the AAU conducted its review of the air ops unit 10 years ago, it noted that the unit did not have a flight operations manual. The AAU noted that pilots are frequently under significant pressure when making weather-related or operational decisions and that such pressure can be detrimental to the quality of their flight operation decisions. The AAU concluded that a well-prepared and utilized manual would allow everyone to understand the high priority assigned to safe, consistent, and logical use of unit aircraft. The recommendations in the "Air Operations Final Report" also identified as a critical priority the need to identify, codify, and maintain minimum performance and operational norms and standards for aviation personnel. The development of an air operations manual could also significantly assist the air ops commanders with familiarizing themselves with aviation operations.

As of September 1999, air ops still did not have a formal operations manual. As described by the AAU reviewer in its 1998 review of air ops, and confirmed by our observations, air ops still relies on "a collection of letters, memos, and past practices." If a chief pilot had primary responsibility for flight operations, this oversight may have been addressed; however, after 11 years, it appears the department has placed little or no priority on remedying this situation. Developing a manual is generally standard practice for aviation operations. Three of the five other agencies we visited during this review have operations manuals. Although differing in some respects, these manuals routinely describe unit administration and various operational aspects, such as safety, normal procedures, aircraft operations, and training.

Air Ops Does Not Ensure Its Pilots and Aircrews Receive Short-Term Operational Information

Air ops does not ensure its pilots are aware of temporary operations issues or procedures before allowing them to fly, nor do air ops pilots consistently document receiving short-term operational information affecting current unit operations. When air ops receives changes or temporary information affecting its mission or procedures, the items are posted on a Notice to Pilots (NOTAP) clipboard. All pilots are supposed to initial posted items to indicate they have read the information. Although the senior pilot for each platoon normally briefs the pilots of such changes during each shift's morning briefing, air ops should have a follow-up procedure to ensure that all pilots are aware of recent NOTAP information.

In some cases, 20 percent of the pilots neglected to acknowledge reading notices affecting missions or procedures.

We reviewed the NOTAP postings and found numerous examples over a three-year period when pilots did not initial posted items. In some cases, 20 percent of the pilots neglected to acknowledge that they had read the posting. For example, on June 25, 1999, air ops was notified that a construction crane would be in service until September 2000 at the Children's Hospital in Los Angeles. The maximum height of the crane is about 200 feet, while the hospital helipad is only 108 feet above the ground. As of August 5, 1999, only 8 of 12 full-time pilots assigned to air ops had initialed the notice regarding this crane.

THE DEPARTMENT LACKS A FORMAL HELICOPTER REPLACEMENT POLICY

The lack of a formal helicopter replacement program, competing capital equipment needs, and limited funding have prevented the air ops unit from acquiring new helicopters. Consequently, the department's helicopters may be less effective in meeting its missions of providing aerial fire suppression, search-and-rescue operations, and air ambulance service. The department also experiences increasing maintenance costs.

The department has submitted yearly budgetary requests to the city for new helicopters since 1992, but did not receive funding for replacement helicopters until three crashed. Due to competing demands for capital equipment, the city has in the past elected to forego purchasing new helicopters. In fiscal year 1997-98, the city purchased 34 ground unit vehicles using

Municipal Improvement Corporation of Los Angeles (MICLA)[1] funds at a total cost of $6.3 million, but it did not approve the purchase of two new helicopters at a cost of $6.3 million each.

A Replacement Program Provides Helicopters That Will Better Meet the Department's Mission

Older model helicopters are less effective in meeting the air ops unit's missions of providing aerial fire suppression, air ambulance, and search and rescue. Additionally, older models are not configured with the latest safety equipment technology.

FIGURE 2

Bell 412 Performing a Search and Rescue Hoist Mission

Source: Bell Helicopter

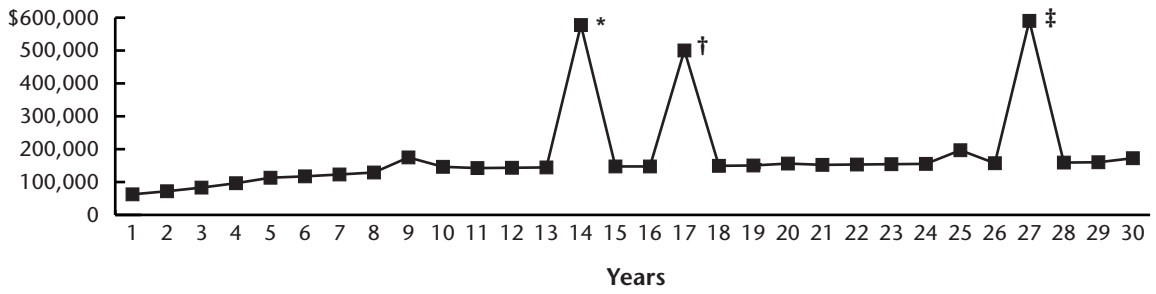
[1] Capital expenditures such as those noted above are not included in the department's annual budget but are financed through the MICLA. The repayment amounts for the certificates are not included in the department's budget but rather in the city's Capital Finance Administration Fund.

The department maintained older Bell 205 models, which have several shortcomings that have been remedied in newer Bell 412 aircraft. These older models were slightly less powerful than the 412 models and the single-blade rotor of the 205 models increases the danger of flying debris, which can injure the crew and passengers when loading patients during air ambulance missions. The single-blade rotor also makes the ride rougher for patients than the Bell 412 and increases pilot fatigue, especially during search-and-rescue hoist missions when the pilot must keep the airborne helicopter stationary.

The newer Bell 412, which is pictured in Figure 2 on the previous page, has a multi-blade rotor and two-engine configuration, so it is slightly more powerful and provides a smoother ride for the pilot and patients. It also has an added margin of safety because it can fly with one engine in the event of engine problems. The Los Angeles County Fire Department had two instances of engine failure in the Bell 412 during 1998 and 1999. In both cases, the helicopters were able to maintain flight with the remaining operative engine and recover to a nearby airport without further damage or injury. In addition, newer model helicopters, like the Sikorsky Black Hawk, are also built to modern crashworthy standards. Because they are designed to absorb impact energy, it is more likely that the crew will survive a crash. Older helicopters lack this newer safety technology.

FIGURE 3

Bell 412 Average Annual Maintenance Cost



Source: Aviation information consultants.

Note: Average of 300 flight hours per year.

* 4,000 hour major overhaul and parts replacement at year 14.

† 5,000 hour major overhaul and parts replacement at year 17.

‡ 8,000 hour major overhaul and parts replacement at year 27.

Maintenance costs for the department's helicopters are increased because the maintenance facility is too small.

In addition to being less effective in meeting mission needs, older helicopters require increased maintenance as they age, such as more extensive scheduled and unscheduled maintenance, major overhauls, part replacements, and airframe refurbishments. To illustrate this point, according to a company that collects aviation information, the average maintenance cost for the Bell 412 in its first year is approximately $62,000. Based on 300 flight hours per year, in its 20th year of operation, the maintenance cost increases over 150 percent to $156,000. As the helicopters get older, major overhauls and parts replacement are also required. At 4,000 hours, these items on a Bell 412 cost approximately $435,000. Similar maintenance at 5,000 hours costs $353,000.

In addition, according to its director, the fleet services maintenance infrastructure was not designed to deal primarily with older helicopters requiring constant modifications and upgrades and is therefore limited in its ability to effectively maintain older helicopters. According to the 1998 AAU report, fleet services lacks adequate maintenance area to efficiently maintain the city's 25 helicopters. This problem would be compounded if fleet services was obligated to maintain older helicopters requiring more extensive and lengthy maintenance. Its lack of sufficient maintenance space contributes to delays in servicing department helicopters. These delays are increased because the multi-blade rotors of the Bell 412 must currently be removed before maintenance can start because the multi-blade rotors increase the required safety area around the helicopter if it is left installed. This increases the time and cost for helicopter maintenance and also increases the potential for damage to the helicopter rotor blades.

A Long-Term Replacement Program Would Increase Air Ops Effectiveness by Adding Stability to the Budgetary Process

The city could benefit from the long-term budgetary planning a helicopter replacement policy would require. The city could anticipate and plan accordingly for upcoming capital expenditures while better meeting the needs of the air ops unit. As an example, the Los Angeles Police Department (police department) had problems similar to the fire department when attempting to replace its older helicopters. In 1995, the police department removed from service three of its Bell Jet Ranger helicopters that had logged over 30,000 hours each and no longer met its needs. However, these helicopters were not replaced until 1997 when

MICLA funds were finally available. The police department has since proposed a formal helicopter replacement program to plan for future replacements.

The police department's Proposed Helicopter Replacement Program:

- Establishes a safe, reasonable, and cost-effective means for the city to replace police department helicopters in a systematic manner and according to clear and measurable criteria.
- Enables the city to plan a funding program based on a fixed replacement schedule.
- Allows the police department to maintain a modern fleet capable of fulfilling its missions.
- Minimizes long-term maintenance costs and maximizes the resale value through a trade-in program for used aircraft.
- Improves safety and reduces potential liability to the city by replacing aircraft before they fail.

The fire and police departments have both proposed helicopter replacement programs; however, the city council has not approved either of them.

The police department's replacement program provides long-term financial planning by projecting the anticipated year of future replacement for the police department's 13 front-line helicopters. The city can then anticipate requests for helicopter replacement over the next 15 years. The fire department has also proposed a similar replacement cycle for:

- The Bell 412 helicopters of 20 years or 9,000 flight hours.
- The Bell 206B helicopters of 20 years or 8,000 flight hours.
- The Bell 206L helicopter of 15 years or 9,000 flight hours.

Neither the fire and police departments' replacement policies have been formally adopted by the city council.

The San Bernardino Sheriff's aviation unit also has a replacement policy, yet it follows a slightly different process; it schedules capital outlays to avoid disrupting the county budget and to obtain a high resale value for its older helicopters. This unit trades in its used helicopters after five years.

RECOMMENDATIONS

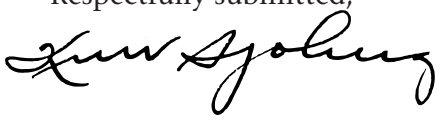
The department should review and revise its administrative and staffing policies to improve unit cohesiveness, standardization, and operational safety. Specifically, the department should:

- Review and revise its staffing policies and patterns to permit all aircrew members to be stationed at air ops.
- Require air ops to establish a formal flight safety program with regularly scheduled meetings for aircrew members.
- Consider hiring a chief pilot who would serve as a single point of command over flight operations.
- Reassess the advisability of changing the classification and lengthening the assignment period of the air ops commander.
- Direct air ops to formalize its policies and procedures into an operations and training manual. These procedures should include an accountability system to ensure pilots are aware of periodic NOTAPS.

The department should also develop, and the city implement, a helicopter replacement program that ensures helicopters are replaced when they become uneconomical to maintain or inappropriate for the demands of the department's evolving missions.

We conducted this review under the authority vested in the California State Auditor by Section 8543 et seq. of the California Government Code and according to generally accepted government auditing standards. We limited our review to those areas specified in the audit scope section of this report.

Respectfully submitted,



KURT R. SJOBERG
State Auditor

Date: November 18, 1999

Staff: Steven Hendrickson, Audit Principal
Arthur Monroe, CPA, CGFM
Matthew Liu

APPENDIX A

Municipal Improvement Corporation of Los Angeles Program for Purchase of Fleet Equipment in Fiscal Year 1997-98

Requested	Number of Units	Unit Cost	Total Cost
Rescue ambulance	26	$ 67,500	$ 1,755,000
Emergency sedan	14	31,000	434,000
Suburban	8	32,000	256,000
Business sedan	45	17,500	787,500
Pick-up truck	8	22,000	176,000
Van trailer	5	51,200	256,000
Aerial ladder apparatus	5	619,000	3,095,000
Triple apparatus	15	290,000	4,350,000
Bell 412 helicopter	2	6,260,818	12,521,636
Waste oil truck	1	100,000	100,000
Lathe machine	1	57,430	57,430
Bulldozer	1	200,000	200,000
Emergency apparatus radio	1	602,000	602,000
5-ton truck	2	200,000	400,000
Swift water rescue vehicle	4	99,220	396,877
Tender	1	33,395	33,395
Total			**$25,420,838**
Approved			
Aerial ladder apparatus	3	$619,000	$1,873,320
Rescue ambulance	21	67,500	1,649,760
Van trailer	1	57,430	57,430
Triple ladder	9	290,000	2,682,540
Total			**$6,263,050**

Source: Los Angeles City Fire Department 1997-98 proposed and approved budget.

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APPENDIX B

Air Operations Unit Statistics

TABLE 1

Overview of Los Angeles City Fire Department Air Operations Unit

Agency	Number of Pilots	Types of Helicopters	Airframe Age	Experience Prerequisite Qualification	Missions	Program Age	Accident History
Los Angeles City Fire Department	12	4 - Bell 412 2 - Bell 206	1 to 13 9 to 15	5 years experience as a firefighter Commercial rotorcraft rating 500 Hrs. of flight time (fixed wing or rotorcraft)	Aerial Fire Suppression Search & Rescue Air Ambulance Aerial Command and Control	37	1970—Engine failure. No injuries and some damage to helicopter. 1974—Helicopter strikes power lines. Two fatalities and helicopter destroyed. 1980*—Accident caused by high winds. No injuries and helicopter destroyed. 1987—Training accident. One injury and major damage to helicopter. 1993—Helicopter strikes light pole while avoiding ground obstacle. No injuries and damage to engine and rotor. 1998—Helicopter strikes power line during training. No injuries and major damage to helicopter. 1998—Helicopter loses tail rotor during flight. Four fatalities and helicopter destroyed. 1999—Engine failure during training. One injury and helicopter destroyed.

* This is the approximate year of the accident.

TABLE 2

Overview of Other Agencies Air Operations Unit

Agency	Number of Pilots	Types of Helicopters	Airframe Age	Experience Prerequisite Qualification	Missions	Program Age	Accident History
Los Angeles County Police Department	45	5 - Bell 206 3 - Bell 407 3 - Bell OH-58* 1 - Bell UH-1H* 5 - Aerospatiale	12 to 26 3 31 33 6 to 10	5 years with department and 3 years field experience 100 hours fixed wing pilot in command	Aerial Law Enforcement Aerial Command and Control	43	1991—Training accident. No injuries and helicopter was destroyed. 1990†—Mechanical failure. Two fatalities and helicopter was destroyed.‡
California Department of Forestry and Fire Protection	20	11 - Bell UH-1H*	27 to 30	2,000 hours pilot in command	Aerial Fire Suppression	27	1973†—A hard landing caused by a maintenance failure. No injuries and damage was repairable. 1996—Tail rotor strikes the ground during training. No injuries and damage was repairable.
Los Angeles County Fire Department	10	1 - Bell 206 3 - Bell 205 4 - Bell 412	21 23 to 27 2 to 18	4,000 flight hours including 1,000 hours mountain time	Aerial Fire Suppression Air Ambulance	42	1977—Mechanical failure. Minor injuries and helicopter was destroyed. 1977—Mid-air collision caused by a civilian aircraft. One fatality and helicopter was destroyed. 1985-—Helicopter struck power lines. No injuries and helicopter was destroyed.
Ventura Sheriff's Department	4	3 - Bell UH-1* 1 - Bell OH - 58* 1 - MD 530F	29 to 37 28 12	3,000 hours pilot in command	Aerial Law Enforcement Search and Rescue Air Ambulance Aerial Fire Suppression	28	1975—Helicopter struck power lines. One fatality and helicopter was destroyed. 1993—Helicopter caught fire while on the ground at a brush fire. One injury and helicopter was destroyed.
San Bernardino Sheriff's Department	15	2 - Boeing MDH 4 - MD 500 E 2 - Bell UH-1* 1 - Bell 212 2 - Hughes OH*	1 13 to 17 30 + 23 30 +	1,000 hours pilot in command	Aerial Law Enforcement Search and Rescue Air Ambulance Aerial Fire Suppression	23	1998—Helicopter flew into hillside. No injuries and helicopter was destroyed. 1986—Helicopter struck power lines. One fatality and helicopter was destroyed.‡

* Surplus helicopters.

† This is the approximate year of the accident.

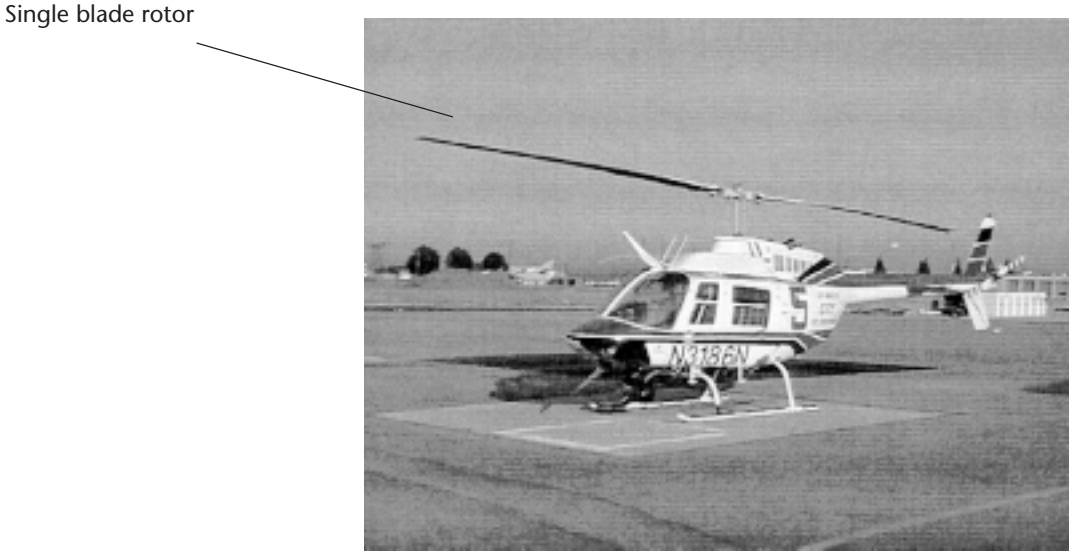
‡ This agency had other accidents, but could not provide further information.

APPENDIX C

Los Angeles City Fire Department Helicopter Fleet

FIGURE 4

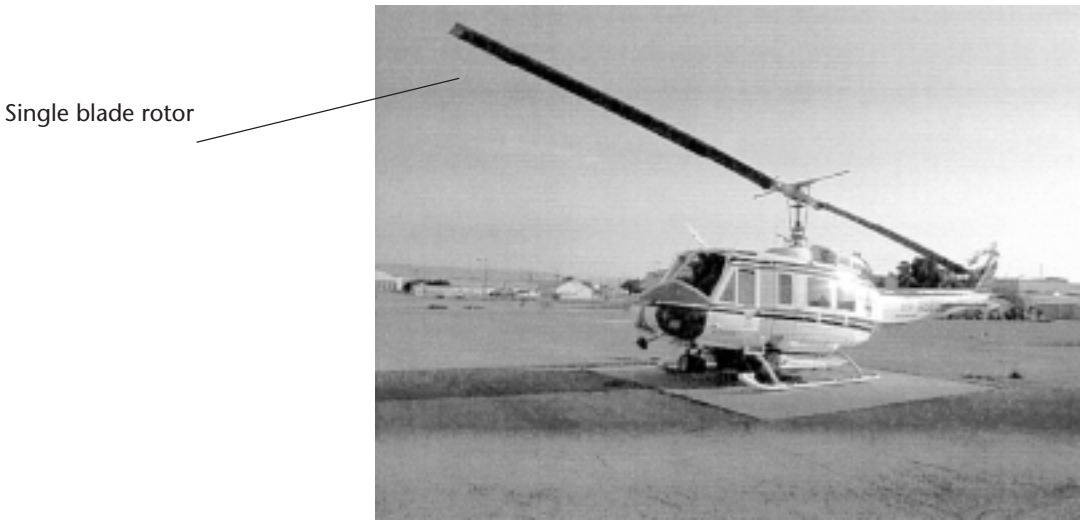
Bell 206—Single Engine Four Passenger



Source: Los Angeles City Fire Department, *Significant Incident Investigation Report Fire 3 Forced Landing, March 23, 1998.*

FIGURE 5

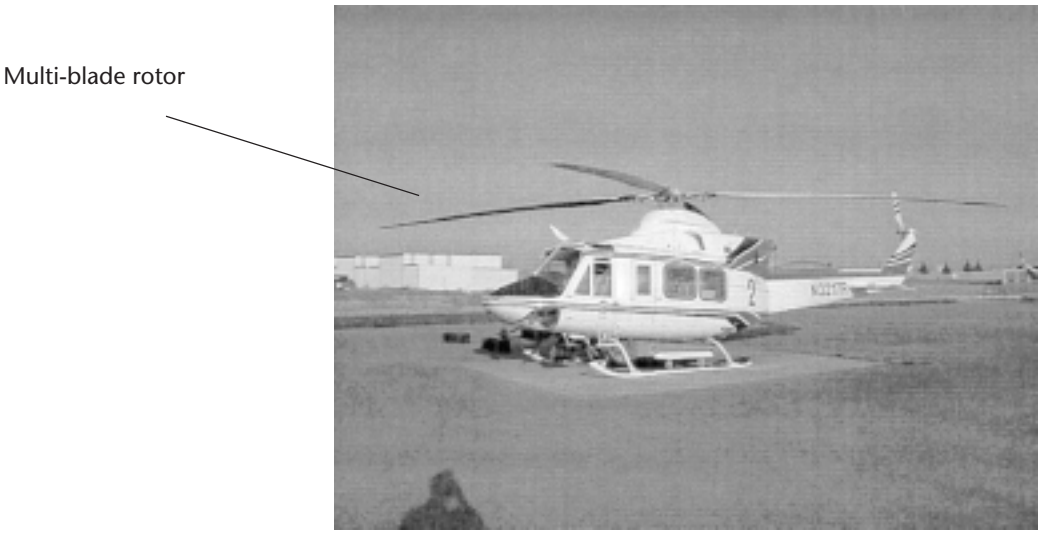
Bell 205—Single Engine Fourteen Passenger



Source: Los Angeles City Fire Department, *Significant Incident Investigation Report Fire 3 Forced Landing, March 23, 1998.*

FIGURE 6

Bell 412—Twin Engine Fourteen Passenger



Source: Los Angeles City Fire Department, *Significant Incident Investigation Report Fire 3 Forced Landing, March 23, 1998.*

Agency's comments provided as text only.

WILLIAM R. BAMATTRE
Fire Chief and General Manager
Los Angeles City Fire Department
200 North Main Street
Los Angeles, California 90012

November 9, 1999

Mr. Kurt Sjoberg
California State Auditor
Bureau of State Audits
555 Capitol Mall, Suite 300
Sacramento, CA 95814

Dear Mr. Sjoberg:

Response to State Audit Report

The Los Angeles Fire Department has put forth a significant effort to identify and implement changes to improve it's aviation unit aircraft and equipment, facilities, maintenance, staffing, training and professional development, and safety. These major issues have been identified and addressed through a series of internal and external audits of the Department's aviation practices and resources. The external audits of the Department's aviation program have also served to validate the extensive research and analysis done by the Air Operations Workgroup and Air Operations Committee in formulating their recommendations.

As referenced several times in the State Audit Report, the Department's Air Operations Workgroup Report includes many recommendations dealing with the same issues raised herein. Fire Department staff has been pleased to work closely with the State's audit team to facilitate their understanding of the complexities of this aviation operation. Fire Department staff has reviewed this document and concurs with all of the audit teams recommendations.

The Fire Department would like to comment on a few important points regarding the information contained in, or omitted, from this audit.

One critical area of concern, which was given little importance in the State Audit Report is that of the Air Operations Facility. The Air Operations Workgroup ranked facility relocation and expansion with the highest priority based upon extreme operational, health and flight safety concerns. Previous reviews have (1)*

*California State Auditior's comments begin on page 39.

found that the living and office space are exceedingly inadequate in relation to the number of personnel assigned. The poor condition of the facility (due to age, inconsistent maintenance and earthquake damage) also poses additional health and safety risks.

(1) In addition, the ramp space used for aircraft parking, flight approach, landing, and take-off is inherently unsafe due to size and location with respect to surrounding development and hazards. For several years, Department water-dropping helicopters have been forced to respond to brush fires without a load of water, in effect sending a "fire truck to a fire with no water in its tank." Although the Department is rapidly moving ahead to correct this problem with a move to a more suitable temporary facility, the Air Operation Facility remains a critical priority for the Department.

Secondly, the Fire Department has implemented, or is in the process of implementing a number of changes to address the State's recommendations. The progress made to date is not adequately acknowledged within the State Audit Report. By the time this report is published, many of the issues raised by the State will have been resolved.

Examples of these improvements are as follows:

(2) Aeromedical Personnel – Effective 11/9/98, aeromedical crewmembers assignment to EMS rescue aircraft duty were limited to designated ground-based paramedic personnel assigned to five (5) rescue ambulances (in closest proximity to the Air Operations Unit). This short-term solution will help alleviate the lack of dedicated aeromedical crews. The Department is currently addressing recommendations to enhance staffing, including areomedical personnel with City Council. It is anticipated that these positions will be in place by the first quarter of 2000.

(3) Part-Time Pilots & Pilot Trainees – Effective 9/1/99, three part-time pilots and two pilot trainees were transferred to Air Operations on a permanent basis. As of this date, all LAFD Pilots are assigned in Air Operations and perform no other collateral duties. These positions will become fully funded when the staffing enhancement proposal is approved by City Council.

(4) Aircraft – The Department will take possession of its new Bell 412 on or about 12/4/99. The new aircraft replaces Fire 3 (Bell 205), increasing the Department's fleet to its normal level of operational strength.

Facilities – Construction of the new temporary Air Operations facility has begun and is anticipated to be completed by 1/7/00. On 10/21/99, the Department's aircraft was relocated to the new facility landing area, resulting in a safe and efficient area for its Flight Approach and Take-Off, (FATO). (5)

Flight and Training Manuals – Air Operations has began preliminary developmental work with the following training manuals: (6)

- Revised and expanded Helitac Training and Certification Manual (Projected completion date is 1/30/00)
- Air Operation Flight and Safety Training Manual - LAPD Air Support Division Manual is being used as model code. (Projected completion date is 3/1/00)
- Aeromedical Operations Training Manual – The U.S. Department of Transportation's Air Medical Crew - National Standard Curriculum is being used as the Department's training manual. (Projected adaptation date is 3/01/00.)

Equipment – The Department has purchased several new pieces of equipment to enhance its mission's capabilities:

Wulberg Radio Systems
GPS Navigational Systems
HEEDS (Helicopter Emergency Escape Vests)

Third, it should be noted that the Fire Department strongly supports the adoption of a helicopter replacement policy and, in fact, has proposed a replacement program methodology on at least two occasions. The Los Angeles City Council is currently considering the Department's proposal. Moreover, the audit falls short in its analysis, or characterization of the condition of the Department's fleet of helicopters as it pertains to a replacement program and aircraft safety.

- The Fire Department aircraft are safe to operate as documented in this report by the conclusions regarding the maintenance provided by the Department of General Services Fleet Services.
- Contrary to the auditor's analysis of other agencies' aircraft replacement programs: 1) almost no agency, including LAPD, has a formal replacement program and 2) the relative age of the Fire Department's aircraft is "younger" than that of most of the agencies surveyed. (7)

In conclusion, the Los Angeles Fire Department acknowledges the concerns expressed by the State Legislature and has been pleased to work with the staff of the State Auditor's Office in conducting this audit. The Department is committed to continue implementation of improvements that enhances its operational capabilities and effectiveness, and provides greater public and firefighter safety within its Air Operations Unit.

Very truly yours,

(Signed by: William R. Bamattre)

WILLIAM R. BAMATTRE
Fire Chief and General Manager

COMMENTS

California State Auditor's Comments on the Response From the Los Angeles City Fire Department

To provide clarity and perspective, we are commenting on the Los Angeles City Fire Department's (department) response to our audit report. The following numbers correspond to the numbers we have placed in the department's response.

(1) We recognize the importance of the facility in creating a safe and efficient aviation environment. On page 11, we noted that the October 1999 move of flight operations to its new temporary facility improved the safety of both its helicopter departures and approaches. Furthermore, as pointed out on page 15, the new temporary facility provides additional accommodations, permitting paramedic personnel to be stationed at the air operations (air ops) facility beginning in the early part of the year 2000.

(2) Our report reflects exactly what the department has included in its response. On page 14, we noted that paramedic personnel are currently assigned to one of five fire stations closest to the air ops facility. In addition, we note on page 15 that the department intends to station paramedic personnel at the air ops facility beginning in January 2000.

(3) The department is incorrect in stating that the pilot trainees were assigned full time to air ops as of September 1, 1999. The only pilots that we identified in our report as part time are the pilot trainees who have been assigned to fire station 90. According to an intra-departmental memo that we have in our possession, the pilot trainees were not reassigned full time to air ops until November 7, 1999.

(4) On page 3 of our report, we acknowledged the department's replacement of three damaged or destroyed helicopters. We have also now included that information on page 10 of the report from which it had been inadvertently omitted.

(5) On page 11 of our report, we acknowledge the new temporary air ops facility and specifically address the improved safety of both helicopter departures and approaches.

(6) We are pleased that the air ops unit is continuing to develop its training manuals. However, as noted on page 21 of our report, air ops still does not have a formal operations manual. Both the 1989 and 1998 flight operations surveys conducted by the Associated Aviation Underwriters pinpointed this as a problem.

(7) We disagree with the department's implication that we stated that almost all other agencies have helicopter replacement programs. The only discussion of other agency's replacement programs in our report is on page 26 and it only identifies one other agency having an approved replacement policy. Furthermore, as discussed with the department at our exit conference, we revised our wording on page 26 to indicate that both the Los Angeles fire and police departments have submitted helicopter replacement proposals to the city council but that neither proposal has been adopted.

Agency's comments provided as text only.

City of Los Angeles
Department of General Services
City Hall South, Room 701
111 East First Street
Los Angeles, California 90012

November 9, 1999

Kurt R. Sjoberg
California State Auditor
555 Capitol Mall, Suite 300
Sacramento, CA 95814

Mr. Sjoberg:

I have reviewed the LAFD audit report and agree with its comments. We share the same concerns in the inadequacies of the maintenance and repair facility. I would like to add that the problems will soon be compounded since the Departments that make up the City's air fleet are contemplating adding larger three and four blade helicopters. The LAPD has already begun the procurement process to replace its fleet. These larger units will worsen the maneuverability of the mechanics and cause additional safety concerns.

Please include these additional concerns in your report. Should you have any questions, please call me at (213) 485-5486.

(Signed by: Alvin Y. Blain)

ALVIN Y. BLAIN
Director of Fleet Services

cc: Members of the Legislature
Office of the Lieutenant Governor
Attorney General
State Controller
Legislative Analyst
Assembly Office of Research
Senate Office of Research
Assembly Majority/Minority Consultants
Senate Majority/Minority Consultants
Capitol Press Corps