OFFICE OF
INSPECTOR GENERAL
U.S. DEPARTMENT OF THE INTERIOR

Office of Aviation Services' Maintenance System Presents a Threat to Public Health and Safety

OFFICE OF
INSPECTOR GENERAL
U.S. DEPARTMENT OF THE INTERIOR

JUN 29 2016

Memorandum

To: Harry Humbert
Deputy Assistant Secretary for Public Safety, Resource Protection, and Emergency Services

From: Michael P. Colombo
Western Regional Manager, Office of Audits, Inspections, and Evaluations

Subject: Management Advisory – Office of Aviation Services' Maintenance System Presents a Threat to Public Health and Safety
Report No. 2016-WR-022

The Office of Inspector General recently conducted an evaluation to determine if the Office of Aviation Services (OAS) implemented a 2009 recommendation to use a centralized web-based maintenance system and also implemented controls over its maintenance system to ensure the safe operation of U.S. Department of the Interior (Department) aircraft. OAS did not implement our recommendation or implement controls over its current maintenance system. The maintenance system OAS currently uses presents a threat to public health and safety because it cannot ensure that all required maintenance has been completed in compliance with OAS policies.

Background

In 2009, we issued an evaluation report titled "Aviation Maintenance Tracking and Pilot Inspector Practices – Further Advances Needed" (WR-EV-OSS-0005-2009, see Attachment). We found that the National Business Center, Aviation Management Directorate (NBC-AMD, later renamed OAS), did not have a centralized web-based maintenance system. NBC-AMD was using a spreadsheet for the lower 48 States and a standalone Maximo Asset Management (Maximo) system in its Alaska Regional Office. We recommended that NBC-AMD "Utilize a centralized web-based maintenance system that provides for real-time input of operation and maintenance activities to allow for effective fleet management."

In 2013, we performed a verification review of our recommendations from the 2009 evaluation report. OAS reported that it had implemented the Financial Business Management System (FBMS) for maintenance management, and we closed the recommendations as resolved and implemented. After the verification review was issued, however, OAS and the Department encountered problems with aviation maintenance implementation in FBMS. Despite attempts from OAS and the Department to address these problems and fully develop FBMS for aircraft maintenance, communication between the parties stopped, and the system was never implemented as originally planned. We later learned that OAS was still not using a centralized web-based system and initiated this evaluation.

Findings

OAS did not implement the 2009 recommendation to use a centralized web-based maintenance system.

Because OAS has not implemented a centralized web-based maintenance system, it cannot effectively manage its fleet. OAS continues to rely on a spreadsheet for the lower 48 States and an outdated version of Maximo in Alaska that is not allowed to connect to the network due to security risks. Neither of these programs allows OAS immediate access to maintenance data; therefore, OAS cannot effectively manage the maintenance program and ensure the safe operation of Department aircraft. The FBMS Business Integration Office continues to believe that FBMS is a viable option for maintenance management at OAS. In addition, the Department has available licenses for a supported version of Maximo.

OAS did not implement internal controls over its maintenance process to ensure the safe operation of Department-owned aircraft.

The spreadsheet-based system currently in use has a number of control deficiencies that increase the risk for errors, data loss, and unsafe aircraft operation. According to the "Standards for Internal Control in the Federal Government," management should design its information systems and related control activities to achieve objectives and respond to risks. We found the following control deficiencies in the spreadsheet-based system:

- The fleet manager is the only individual responsible for developing, maintaining, and populating the maintenance tracking spreadsheet. He told us he is overwhelmed with the amount of work involved with manually maintaining the spreadsheet in addition to his other duties and has not taken leave since 2013. He also estimates that he works hundreds of extra hours of unpaid overtime each year to perform his duties. There is no trained employee to back up the fleet manager should he become unavailable.

- The data contained in the spreadsheet are not secure. The spreadsheet is saved on a single laptop computer and is backed up to a series of USB thumb drives. If something were to happen to the laptop and thumb drives, there could be a total loss of data.

- The spreadsheet does not contain data validation or input controls; therefore, OAS cannot assure that data may not be inadvertently changed or lost. The fleet manager acknowledged that he is beginning to catch himself making input errors due to high workload.

- The spreadsheet is not up-to-date with current maintenance information. When we visited OAS headquarters, the fleet manager was 2 weeks behind on data entry. Without timely data input, OAS cannot ensure that aircraft are safe for use.

- The spreadsheet does not keep a record of aircraft maintenance history. OAS cannot easily determine the maintenance history of an aircraft or ensure that it received maintenance at the intervals that OAS policy requires.

- The spreadsheet is not complete. The fleet manager is in the process of redesigning it and is doing so without following a formal Systems Development Life Cycle as recommended by the "Standards for Internal Control in the Federal Government."

Conclusions and Recommendations

Safety is paramount in aviation. Without a centralized web-based maintenance system or sufficient controls over the existing maintenance system to ensure aircraft are safe to use, OAS is exposed to significant risk and liability. In addition to the safety risk, maintenance data in the spreadsheet-based system are of limited value, at risk of being lost, and do not provide OAS management the information it needs to effectively manage its fleet.

We asked the Office of Policy, Management and Budget to reinstate Recommendation 1 from our 2009 report until OAS can demonstrate it has implemented a centralized web-based maintenance system (see Attachment).

To immediately address the internal control deficiencies of the existing system, we recommend that the Deputy Assistant Secretary for Public Safety, Resource Protection, and Emergency Services direct the OAS Director to immediately implement the following corrective actions:

1. Train an employee to back up the fleet manager and mitigate risks associated with limiting access and control of a system to one individual;

2. Ensure maintenance records are backed up in compliance with Government records management and information technology standards; and

3. Ensure accurate and complete input of maintenance data in a timely manner.

Please provide us with your written response to this report within 30 days. The response should provide information on actions taken or planned to address the recommendations, as well as target dates and title(s) of the official(s) responsible for implementation. Please send your response to aie_reports@doioig.gov.

If you have any questions regarding this management advisory, please contact me at 916-978-5653.

The legislation creating the Office of Inspector General requires that we report to Congress semiannually on all audit, inspection, and evaluation reports issued; actions taken to implement our recommendations; and recommendations that have not been implemented.

We conducted our evaluation in accordance with the Quality Standards for Inspection and Evaluation as put forth by the Council of the Inspectors General on Integrity and Efficiency. We believe that the work performed provides a reasonable basis for our conclusions and recommendations.

Attachment

Our referral to the Office of Policy, Management and Budget to reinstate Recommendation 1 from our 2009 report until the Office of Aviation Services can demonstrate it has implemented a centralized web-based maintenance system follows on page 2. Our 2009 report, "Aviation Maintenance Tracking and Pilot Inspector Practices – Further Advances Needed" (WR-EV-OSS-0005-2009) follows on page 4.

OFFICE OF
INSPECTOR GENERAL
U.S.DEPARTMENT OF THE INTERIOR

June 14, 2016

Memorandum

To: Kristen J. Sarri
Principal Deputy Assistant Secretary for Policy, Management and Budget

From: Michael P. Colombo
Western Regional Manager for Audits, Inspections, and Evaluations

Subject: Reinstatement of Recommendation 1 in "Aviation Maintenance Tracking and Pilot Inspector Practices – Further Advances Needed"
Report No. WR-EV-OSS-0005-2009

In accordance with the Department Manual (361 DM 1), we are referring Recommendation 1 in the subject report to be reinstated for implementation tracking (see Attachment).

> **Recommendation 1** – Utilize a centralized web-based maintenance system that provides for real-time input of operation and maintenance activities to allow for effective fleet management.

Our subject report contained three recommendations, and on May 22, 2013, we reported to the Office of Financial Management that they had been resolved and implemented. This determination was made based on information provided by the Office of Aviation Services (OAS).

On February 4, 2016, we announced a follow-up evaluation of the OAS maintenance system after receiving information that OAS did not implement our 2009 recommendation to use a centralized web-based maintenance system. We confirmed that despite attempts to develop a maintenance system in the Financial Business Management System, OAS did not adopt the new system and 7 years later continues to rely on an outdated version of Maximo Asset Management software for the Alaska Regional Office and a spreadsheet for the Headquarters Office in Boise, Idaho.

If you have any questions regarding this referral, please call me at 916-978-5653.

Attachment

cc: Olivia Ferriter, Deputy Assistant Secretary for Policy, Management and Budget
Douglas Glenn, Director, Office of Financial Management

Allen Lawrence, Division Chief, Internal Control and Audit Follow-up, Office of Financial Management
Alexandra Lampros, Liaison Officer, Office of Financial Management
Harry Humbert, Deputy Assistant Secretary Public Safety, Resources Protection, and Emergency Services
Mark Bathrick, Director Office of Aviation Services

U.S. Department of the Interior
Office of Inspector General

Aviation Maintenance Tracking and Pilot Inspector Practices—Further Advances Needed

Report No. WR-EV-OSS-0005-2009
April 2009

Cover Graphics:

- Cessna 206 aircraft from www.cessna.com
- Quest Kodiak aircraft from www.questaircraft.com
- USPP helicopter from www.nps.gov/uspp

United States Department of the Interior

Office of Inspector General
Western Region
Federal Building
2800 Cottage Way, Suite E-2712
Sacramento, California 95825

April 14, 2009

Memorandum

To: Doug Bourgeois
Director, National Business Center

From: Michael P. Colombo
Regional Manager

Subject: Aviation Maintenance Tracking and Pilot Inspector Practices—Further Advances Needed (Report No. WR-EV-OSS-0005-2009)

After several decades of success in reducing aircraft accidents, the National Business Center-Aviation Management Directorate (NBC-AMD) faces new challenges in its continuing efforts to provide safe aircraft services. With aging aircraft and changing technology affecting maintenance tracking systems and training requirements, NBC-AMD now has the opportunity to prepare the Department of the Interior's (DOI) fleet and pilots for the decades to come.

Our evaluation revealed that NBC-AMD has two separate maintenance tracking systems, neither of which is adequate for tracking maintenance of its diverse, complex, and changing fleet. Utilizing an Excel spreadsheet for the lower 48 states and a stand-alone system in Alaska provides NBC-AMD staff with neither the information necessary for reliable and timely maintenance scheduling nor coordinating programmatic needs. NBC-AMD needs a system capable of accurately tracking, forecasting, and planning the maintenance of the Department's diverse and complex fleet.

Additionally, NBC-AMD needs to improve its pilot inspector program by standardizing its pilot inspector flight-testing and annual flight-hour training requirements. Although NBC-AMD has developed processes and standards for continuous pilot evaluation and training, the guidance was vague, subject to differing interpretations, and less comprehensive than industry standards. For example, the inspector's annual flight-hour training requirements lacked specific training curriculum and oversight on the kind of training that needed to be accomplished. Specifically, annual requirements do not include training hours for "special-use" flying (i.e., low-level and mountain flying, wild animal capture, migratory bird counts, etc.), which is a critical training component for inspectors to maintain proficiency at the tasks for which they test other pilots. Without these standards, pilot inspectors and fleet pilots may misapply or

inconsistently apply the standards on their own. One result of this inconsistency is that inspectors are "radically different in how they conduct evaluations," according to one Aviation Management Directorate (AMD) official experienced with pilot inspectors. As a result, we call into question the skill level and proficiency of Departmental fleet pilots and pilot inspectors.

In our report, we make three recommendations to address these concerns.

Contents

Page

Background 1
Maintenance Tracking 2
Pilot Inspector Program 3
Recommendations 4
Appendices
1 Objective, Scope, and Methodology 5
2 Sites Visited 6

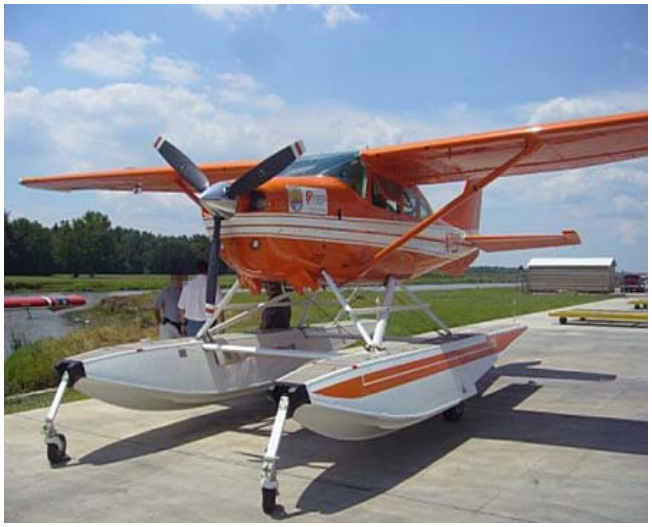
Acronyms

AMD .....Aviation Management Directorate
DOI ..... Department of the Interior
MMS ..... Minerals Management Service
NBC .....National Business Center
NBC-AMD .....National Business Center-Aviation Management Directorate
NOAA .....National Oceanic and Atmospheric Administration
NPS ..... National Park Service
OAS.....Office of Aircraft Services
OIG ..... Office of Inspector General
USFWS .....United States Fish & Wildlife Service
USFS .....United States Forest Service
USPP .....United States Park Police

Background

In 1972, a task force comprised of representatives from Department of the Interior (DOI) bureaus conducted a review to evaluate its aircraft operations. The study found that during the 5 years prior to the study, 148 accidents were reported involving DOI aircraft. These accidents caused the deaths of 29 employees, serious injuries to 48 employees, and cost DOI $3.1 million in property damages and compensatory claims, with at least $9 million in claims pending. The task force recommended that DOI create an Office of Aircraft Services (OAS), which would be responsible for overall direction and coordination of aircraft operations in DOI. On July 1, 1973, the Secretary of the Interior established the OAS.

In October 2001, the Secretary of the Interior signed an order to realign the OAS under the National Business Center (NBC). Once OAS was integrated with NBC, it was renamed as the National Business Center-Aviation Management Directorate (NBC-AMD). NBC-AMD still provides the same services that OAS did for DOI, but also provides services to non-DOI agencies, including the Department of Defense (DOD), Environmental Protection Agency, National Oceanic Atmospheric Association (NOAA), National Science Foundation, United States Coast Guard, and United States Forest Service (USFS).



NBC-AMD Airplane ***DOI-OIG Photo***

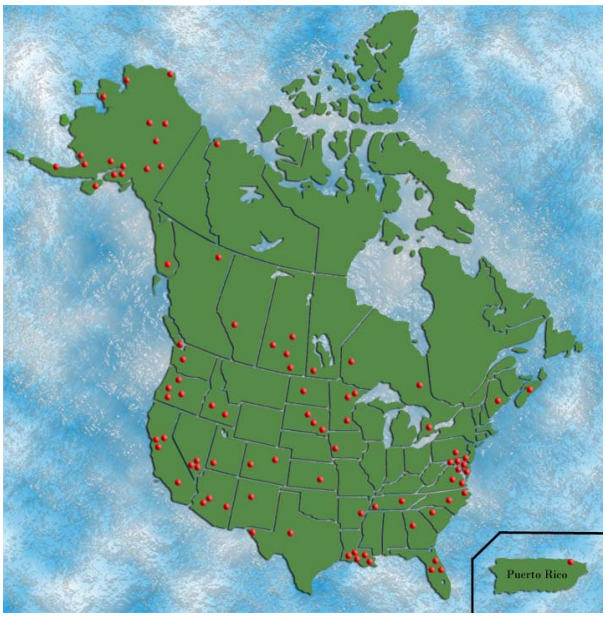
NBC-AMD's responsibility is broad and includes oversight of Departmental and bureau aviation policy, safety programs, training and evaluations, fleet aircraft and pilots, and hundreds of vendor aircraft and pilots. NBC-AMD's responsibility is "...to raise the safety standards, increase the efficiency, and promote the economical operation of aircraft activities in the Department of the Interior." The diversity of DOI's missions demands more complex aviation operations and a larger fleet size than many other federal agencies. DOI is one of 11 federal agencies outside of the DOD that own and operate aircraft to accomplish its mission. Of the approximate 1,500 government-operated aircraft, DOI operates 100 of these aircraft, located in 17 states, consisting of 31 makes and models. More than one-third of these aircraft were acquired before 1990. The fleet will expand in the next few years with the acquisition of five new, technologically advanced aircraft.

Since its inception, NBC-AMD has implemented measures to improve safety in the fleet through its programs. However, after several decades of success in reducing aircraft accidents, NBC-AMD faces new challenges in its continuing efforts to provide safe aircraft services. With aging aircraft and changing technology affecting maintenance tracking systems and training requirements, NBC-AMD now has the opportunity to prepare DOI's fleet and pilots for the decades to come.

Maintenance Tracking

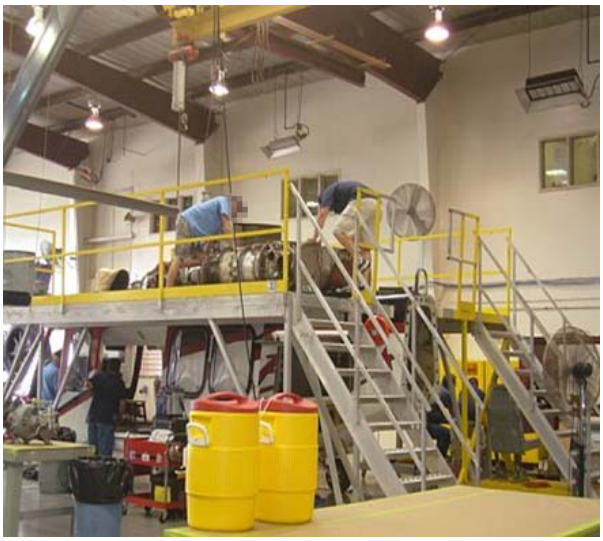
To manage the maintenance of fleet aircraft, the NBC-AMD Alaska Regional Office uses the Maximo Asset Management (Maximo) software, a system accessible only to those in Alaska. The headquarters office located in Boise, Idaho (Headquarters) uses an Excel spreadsheet accessible to a limited audience for aircraft located in the lower 48 states.

In Alaska, 30 percent of the aviation maintenance conducted on fleet aircraft is performed at NBC-AMD's hangar in Anchorage. The remaining maintenance work in Alaska and throughout the lower 48 states is done by one of more than a hundred different vendors located in 37 states, Canada, and Puerto Rico.



DOI Aircraft Maintenance Vendors

Presently, neither the system in Alaska nor at Headquarters allows the mechanics who conduct this work to provide real-time updates. Instead, mechanics have to send their paper invoices to NBC-AMD staff who manually input the information into their respective tracking systems. In addition, the current processes rely in part on pilots alerting maintenance specialists as to when maintenance is needed. As a result, information is not timely, reliable, or accessible for planning purposes or to those who need access to the status of their aircraft.

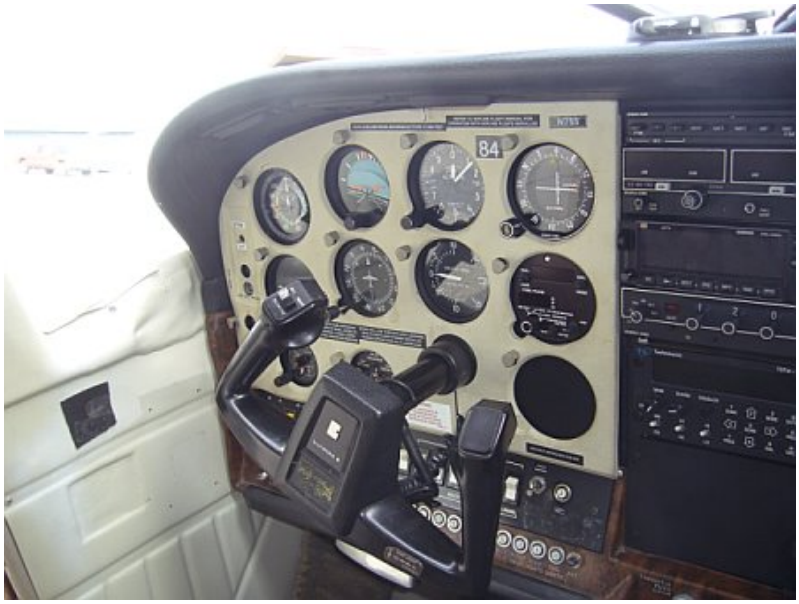


Vendor Maintenance Facility DOI-OIG Photo

An effective maintenance tracking system provides accessibility to those involved in aircraft maintenance and includes options for maintenance and related scheduling. Such a system allows maintenance specialists more time to visit and assess maintenance vendor shops for safety and compliance in addition to entering and monitoring data. A centralized system frees up maintenance specialists' time because it allows a greater audience of users access to aircraft maintenance-status information. In addition, users could access the system and provide more timely updates on maintenance activities.

The maintenance tracking software used by NOAA is one of several types of tracking systems available on the market today. Other systems include those created by Avtrak and Computerized Aircraft

Maintenance Programs, which allow users to access records via the Internet in real time. NOAA has used software called Flight Watch for the last 11 years to track aircraft maintenance. The program allows aircraft mechanics and others to track parts, schedule maintenance, and record pilots' flight hours. Flight Watch also includes other tie-ins, such as a financial tie-in, to keep track of expenses. The system was designed to interface with other systems used by NOAA personnel. One NOAA aviation official described the system as "unifying" in that it allows a range of users to input data and access information, such as pilots inputting their flight hours from their logbooks.



Controls of an NBC-AMD aircraft ***DOI-OIG Photo***

Although NBC-AMD chose Maximo software to track maintenance over 5 years ago, only the NBC-AMD Alaska Regional Office uses it. In addition, this office uses an older version that does not allow users to access records via the Internet. The latest version of the software, 7.1, allows users real time access via the Internet as well as a central database from which to enter and monitor maintenance information.

We issued a Notice of Potential Finding and Recommendation on the topic of aviation maintenance tracking systems to NBC-AMD. In its response to our concerns, NBC-AMD recognized a need to upgrade its tracking systems. It stated it has performed extensive evaluation of tracking systems for several years at a cost exceeding $1.2 million. Even though NBC-AMD determined that Maximo met its needs, the software has yet to be implemented in the lower 48 states and upgraded in Alaska.

Pilot Inspector Program

One of the tasks performed by NBC-AMD is periodic testing and retesting of its pilot staff, comprised of both pilots and pilot inspectors. Pilot inspectors ensure that both fleet and vendor pilots have the skills necessary to perform DOI missions, including wild animal capture and tracking, migratory bird counts, low-level wildlife surveys, natural resource protection, and law enforcement. NBC-AMD has 14 pilot inspectors who primarily conduct evaluations of the flight skills of DOI's approximately 110 fleet pilots as well as hundreds of vendor pilots.

Although NBC-AMD has a testing program, it is not standardized in that each pilot inspector has different interpretations of the skills necessary for a pilot to pass check ride evaluations. Some standards have been developed; however, they are vague and less comprehensive than Federal Aviation Administration pilot test standards. Moreover, NBC-AMD does not have a designated official to explain and uphold the

existing standards, such as the USFS' standardization instructor pilot. Without a designated standardization instructor pilot to set the standards, each pilot inspector is left to interpret the test standards individually. One AMD official said, "Pilot inspectors conduct check ride evaluations differently and some pilot inspectors are radically different in how they conduct the evaluation." In contrast, the USFS has two standardization instructor pilot positions, one for fixed-wing aircraft and one for helicopters, to set the standards for the check ride evaluations.

Standards are also lacking in pilot inspector flight-hour requirements. Inspectors are expected to have 24 flight hours of pilot in command[1] experience each year, with 6 of those hours completed in the last 6 months. However, the hourly requirement has no specific curriculum or oversight for what the training should include. One pilot inspector said that not having a special-use training curriculum is an "extreme weakness." Because pilot inspectors conduct evaluations of other pilot's special-use maneuvers such as low-level flying, mountain flying, animal herding, and much more, it would seem appropriate that some of the hours be spent developing and honing those skills, as is the case with USFS pilot inspectors. Instead, we found that some inspectors perform simple tasks to meet their annual flight-hour requirement. For example, it was reported to us that some pilot inspectors fly simple routes between Boise and Coeur d'Alene, Idaho, without employing any special-use maneuvers. We believe that DOI's minimum hourly flight requirement is arbitrary as no one could explain how the 24-hour time element was established as the appropriate number to retain proficiency. In sharp contrast to DOI, the USFS requires 100 hours of annual flight time from its pilot inspectors. USFS pilot inspectors, as part of their annual flight-hour requirement, perform special-use missions that help them meet their annual goal and retain proficiency at the tasks for which they test other pilots.

We issued a Notice of Potential Finding and Recommendation on the pilot inspector program to NBC-AMD officials who acknowledged improvement is needed in their flight standardization program and that annual flight training minimums should be increased. They reported to be collaborating with USFS to establish an interagency/shared flight standardization position and developing an NBC-AMD pilot training program syllabus.

Recommendations

We recommend that AMD:

1. Utilize a centralized web-based maintenance system that provides for real-time input of operation and maintenance activities to allow for effective fleet management.
2. Develop a pilot training program syllabus and utilize standardization instructor pilots for its helicopter and fixed-wing programs.
3. Evaluate annual pilot inspector flight-hour requirements to establish the appropriate hours needed to effectively perform their duties and to incorporate special-use mission maneuvers during the training.

[1]The pilot in command has direct responsibility and final authority for the safe operation of the aircraft.

Appendix 1
Objective, Scope, and Methodology

Objective:

To evaluate whether or not adequate aviation processes exist to maintain a safe environment for people and property.

Scope:

The evaluation covered the aviation activities of NBC-AMD and DOI bureaus for fiscal years 2006 and 2007.

Methodology:

To accomplish the evaluation objective we:

- Conducted the evaluation in accordance with the *Quality Standards for Inspections* issued by the President's Council on Integrity and Efficiency.
- Gained an understanding of NBC-AMD's and DOI bureaus' aviation programs by interviewing NBC-AMD officials and bureau officials at headquarters, regional, and field offices.
- Visited selected vendor and NBC-AMD/DOI sites to review contract files, maintenance files, pilot files, pilot inspector files, and discussed aviation issues with officials. We selected sites based on preliminary assessments.
- Reviewed the employee survey from the DOI OIG's Health and Safety Audit[2] as it related to aviation safety.
- Reviewed maintenance procedures and tracking systems in the lower 48 states and in Alaska.
- Analyzed and compared the requirements for NBC-AMD pilot inspectors and USFS pilot inspectors.
- Inspected aviation maintenance facilities, hangars, and storage areas.
- Reviewed the processes and requirements for hiring new NBC-AMD pilot inspectors.

[2] Department of the Interior, Office of Inspector General report number C-IN-MOA-0011-2006

Appendix 2
Sites Visited

Office	Location
NBC-AMD Headquarters	Boise, Idaho
NBC-AMD Western Region	Boise, Idaho & Phoenix, Arizona
NBC-AMD Eastern Region	Atlanta, Georgia
NBC-AMD Alaska Region	Anchorage, Alaska
NPS Denali National Park	Denali, Alaska
USFWS Hangar Facility	Fairbanks, Alaska
MMS Field Office	Lake Charles, Louisiana
Era Helicopters, LLC	Lake Charles, Louisiana
Acadiana Regional Airport	New Iberia, Louisiana

Report Fraud, Waste, Abuse And Mismanagement

Fraud, waste, and abuse in government concerns everyone: Office of Inspector General staff, Departmental employees, and the general public. We actively solicit allegations of any inefficient and wasteful practices, fraud, and abuse related to Departmental or Insular area programs and operations. You can report allegations to us in several ways.

By Mail:	U.S. Department of the Interior Office of Inspector General Mail Stop 4428 MIB 1849 C Street, NW Washington, D.C. 20240	
By Phone:	24-Hour Toll Free Washington Metro Area	800-424-5081 703-487-5435
By Fax:	703-487-5402	
By Internet:	www.doioig.gov	

Revised 06/08

Report Fraud, Waste, and Mismanagement

Fraud, waste, and mismanagement in Government concern everyone: Office of Inspector General staff, departmental employees, and the general public. We actively solicit allegations of any inefficient and wasteful practices, fraud, and mismanagement related to departmental or Insular Area programs and operations. You can report allegations to us in several ways.

By Internet: www.doi.gov/oig/index.cfm

By Phone: 24-Hour Toll Free: 800-424-5081
Washington Metro Area: 202-208-5300

By Fax: 703-487-5402

By Mail: U.S. Department of the Interior
Office of Inspector General
Mail Stop 4428 MIB
1849 C Street, NW.
Washington, DC 20240