Audit Report

YEAR 2000 COMPLIANCE OF THE
NAVY PIONEER UNMANNED AERIAL VEHICLE

Report Number 99-169 May 24, 1999

Office of the Inspector General
Department of Defense

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Acronyms

UAV	Unmanned Aerial Vehicle
Y2K	Year 2000

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
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ARLINGTON, VIRGINIA 22202

May 24, 1999

MEMORANDUM FOR COMMANDER IN CHIEF, U.S. PACIFIC COMMAND
ASSISTANT SECRETARY OF THE NAVY (FINANCIAL MANAGEMENT AND COMPTROLLER)

SUBJECT: Audit Report on Year 2000 Compliance of the Navy Pioneer Unmanned Aerial Vehicle (Report No. 99-169)

We are providing this report for your information and use. This report is one in a series being issued by the Inspector General, DoD, in accordance with an informal partnership with the Chief Information Officer, DoD, to monitor efforts to address the year 2000 computing challenge. Because this report contains no findings or recommendations, no written comments were required, and none were received. Therefore, we are publishing this report in final form.

We appreciate the courtesies extended to the audit staff. Questions on the audit should be directed to Mr. Joseph Doyle at (703) 604-9348 (DSN 664-9348) or Mr. John Yonaitis at (703) 604-9340 (DSN 664-9340). See Appendix B for the report distribution. The audit team members are listed inside the back cover.

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Report No. 99-169 **May 24, 1999**
(Project No. 9CC-0086.09)

Year 2000 Compliance of the Navy Pioneer Unmanned Aerial Vehicle

Executive Summary

Introduction. This is one in a series of reports being issued by the Inspector General, DoD, in accordance with an informal partnership with the Chief Information Officer, DoD, to monitor DoD efforts to address the year 2000 computing challenge. For a list of audit projects addressing the issue, see the year 2000 web page on the IGnet at http://www.ignet.gov.

Objectives. The overall audit objective was to assess the status of Military Department and Defense agency mission critical systems, identified by the U.S. Pacific Command and U.S. Forces Korea, as being of particular importance to them in attaining compliance with year 2000 conversion requirements. Specifically, we reviewed the progress of each system towards year 2000 compliance, testing and integration of modifications, and contingency plans. For this report, we reviewed the Navy Pioneer Unmanned Aerial Vehicle.

Results. The Navy Pioneer Unmanned Aerial Vehicle is year 2000 compliant. An inappropriate certification level was reported in the DoD year 2000 database and the system underwent a validation phase that was not strictly necessary. However, the validation testing provided extra assurance that the system is year 2000 ready.

Management Comments. We provided a draft of this report on May 6, 1999. Because this report contains no findings or recommendations, written comments were not required, and none were received. Therefore, we are publishing this report in final form.

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Background

The Executive Order, "Year 2000 Conversion," February 4, 1998, mandates that Federal agencies do what is necessary to ensure that no critical Federal program experiences disruption because of the year 2000 (Y2K) computing problem. The Executive Order also requires that the head of each agency ensure that efforts to address Y2K issues receive the highest priority.

The Assistant Secretary of Defense (Command, Control, Communications and Intelligence) is the principal staff assistant responsible for the DoD Y2K Management Plan. The DoD Y2K Management Plan, version 2, December 1998, provides guidance for testing and certifying systems and preparing contingency plans for those systems, and stipulates the criteria that DoD Components must use to meet reporting requirements.

The U.S. Navy Year 2000 Action Plan, September 1998, provides the guidance for planning and implementing all information technology, software, and Navy systems that face a Y2K problem. The Navy has direct responsibility for ensuring the year 2000 readiness of the Navy Pioneer Unmanned Aerial Vehicle (UAV) system.

The Navy Pioneer UAV is a surveillance system consisting of an unmanned air vehicle navigated by a control station or programmed to fly independently on autopilot. The control station can be a ground control station or a portable control station. The Navy Pioneer UAV is a push-propeller driven vehicle and relays video and telemetry information from its television camera or infrared sensor. The Navy Pioneer UAV mission is to provide around the clock near-real-time reconnaissance, battle-damage assessment, and target identification within control station line-of-sight.

Objectives

The overall objective was to assess the status of Military Department and Defense agency mission critical systems identified by the U.S. Pacific Command and U.S. Forces Korea as being of particular importance to them in attaining compliance with year 2000 conversion requirements. Specifically, we reviewed the progress of each system towards year 2000 compliance, testing and integration of modifications, and contingency plans. For this report, we reviewed the Navy Pioneer UAV system. See Appendix A for a discussion of the scope and methodology, and summary of prior coverage.

Year 2000 Compliance of the Navy Pioneer Unmanned Aerial Vehicle

The Navy Pioneer UAV is year 2000 compliant. An inappropriate certification level was reported in the DoD Y2K database. As a result, the Navy Pioneer UAV underwent a validation phase that was not strictly necessary; however, the validation tests provided extra assurance that the system will not be vulnerable to Y2K problems.

Certification Levels

The DoD Y2K Management Plan, version 2, December 1998, requires DoD Components to prioritize mission critical systems to determine systems that should receive a higher priority in the testing and certification process. The plan also requires a determination of mission impact should the system or its interfaces fail, and defines the certification levels.

The Program Executive Office, Cruise Missiles and Joint Unmanned Aerial Vehicles, a Component of the Naval Air Systems Command, manages the Navy Pioneer UAV system with oversight from Headquarters, Department of the Navy. The program executive office certified the system year 2000 compliant with a 2b certification. Certification level 2b indicates that an independent audit of a system and testing was completed using a two digit year format. However, the Navy Pioneer UAV year 2000 test report, October 30, 1998, shows that the system does not process any mission critical date or time data related to the year 2000 changeover. The Navy Pioneer UAV mission critical elements had been determined to be well protected against year 2000 and critical date changeovers, and should appropriately have been reported as a level 5 certification. DoD designates a system as certification level 5 if it does not process date related data and would not be affected by the year 2000 changeover.

Testing of the Navy Pioneer UAV

The Navy Pioneer UAV test results confirmed that the system does not use mission critical date or time entries relating to the year 2000, and there are no mathematical algorithm changes to the system as a result of date or time changes. The Aircraft Armament Industries Corporation, Baltimore, Maryland, performed the independent year 2000 compliance validation testing of the Navy Pioneer UAV in October 1998, using Pioneer 10.1c version software, at a cost of about $125,000. The tests were reviewed by the Naval Air Warfare Center, Aircraft Division, Patuxent River, Maryland. The tests included the ground control station pilot bay, the tracker bay, the observer bay, the tracking control unit, the preset payload menu, and board-on-board test air vehicles.
A computer-based simulator for the air vehicle Global Positioning System receiver was employed during the testing to provide dates and times to the system flight computer. The simulator was also used to read back date and time information and verify reset commands from the ground via the flight computer.

Validation testing confirmed that the system did not process any mission critical Y2K data and did not need to have been reported at a certification level requiring independent audit and testing.

Contingency Management Plan

The Pioneer UAV system is not affected by year 2000 date or time changes. The contingency management plan states that Pioneer UAV mission critical elements would not be affected by the year 2000 because any date and time changes applied to the system are used only for display. Therefore, the Navy Pioneer UAV Y2K risks are very low. The plan identified risks such as location failure, initialization date entry failure, and date report failures. The plan covered procedures for work arounds and permanent fixes for these risks and shows how the system can continue to operate after the year 2000. The plan also listed specific risks, the probability of occurrence, and the corrective actions to be taken.

Implementation Plan

The Program Executive Office, Cruise Missiles and Joint Unmanned Aerial Vehicles manages nine Navy Pioneer UAV systems. However, plans have been implemented to reduce the number of systems to five by October 1999. Those five systems were implemented as of March 13, 1999. The Navy Pioneer UAV system will start to be phased out of service in fiscal year 2003, and replaced with the Vertical Take-off Unmanned Aerial Vehicle.

Conclusion

The Navy Pioneer (UAV) was initially reported in the DoD Y2K database as requiring independent audit and testing and subsequently certified as year 2000 compliant. The system is immune to year 2000 problems, and is not affected by date or time changes. Therefore, the certification level for Pioneer UAV should have been level 5, showing that the system does not process sensitive year 2000 date related data. However, the validation testing provided extra assurance that the system is Y2K ready.

Appendix A. Audit Process

This is one in a series of reports being issued by the Inspector General, DoD, in accordance with an informal partnership with the Chief Information Officer, DoD, to monitor DoD efforts to address the year 2000 computing challenge. For a list of audit projects addressing the issue, see the Y2K web page on the IGnet at http://www.ignet.gov.

Scope

We reviewed and evaluated the Pioneer UAV system. We visited the program executive office responsible for the Navy Pioneer UAV and met with officials to obtain the year 2000 status of the system. During our meetings, we obtained data pertaining to the Navy Pioneer UAV program.

DoD-wide Corporate Level Government Performance and Results Act Goals. In response to the Government Performance Results Act, the Department of Defense has established 6 DoD-wide corporate level performance objectives and 14 goals for meeting these objectives. This report pertains to achievement of the following objectives and goals.

> **Objective:** Prepare now for an uncertain future. **Goal:** Pursue a focused modernization effort that maintains U.S. qualitative superiority in key war fighting capabilities. **(DoD-3)**

DoD Functional Area Reform Goals. Most major DoD functional areas have also established performance improvement reform objectives and goals. This report pertains to achievement of the following functional area objectives and goals.

- **Information Technology Management Functional Area.**
  Objective: Become a mission partner. **Goal:** Serve mission information users as customers. **(ITM-1.2)**
- **Information Technology Management Functional Area.**
  Objective: Provide services that satisfy customer information needs.
  Goal: Modernize and integrate DoD information infrastructure.
  (ITM 2.2)
- **Information Technology Management Functional Area.**
  Objective: Provide services that satisfy customer information needs.
  Goal: Upgrade technology base. **(ITM-2.3)**

General Accounting Office High-Risk Area. In its identification of high-risk areas, the General Accounting Office has specifically designated risk in resolution of the Y2K problem as high. This report provides coverage of that problem and the overall Information Management and Technology high-risk area.

Methodology

Audit Type, Dates, and Standard. We performed this program audit from March 24, 1999 to April 23, 1999, in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. We did not use computer-processed data to perform this audit.

Contacts During the Audit. We visited or contacted individuals and organizations within DoD and Aircraft Armament Industries Corporation. Further details are available upon request.

Management Control Program. We did not review the management control program related to the overall audit objective because DoD recognized the Y2K issue as a material management control weakness area in the FY 1998 Annual Statement of Assurance.

Summary of Prior Coverage

The General Accounting Office and the Inspector General, DoD, have conducted multiple reviews related to Y2K issues. General Accounting Office reports can be accessed over the Internet at http://www.gao.gov. Inspector General, DoD reports can be accessed over the Internet at http://www.dodig.osd.mil.

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  Relations, Committee on Government Reform
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Audit Team Members

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