

Audit



Report

OFFICE OF THE INSPECTOR GENERAL

DEVELOPMENT OF THE P-3/PIONEER PROJECT

Report No. 95-255

June 27, 1995

Department of Defense

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Acronym

TESA

Television Enhanced Situational Awareness

Report No. 95-255

June 27, 1995

**MEMORANDUM FOR ASSISTANT SECRETARY OF THE NAVY (FINANCIAL
MANAGEMENT AND COMPTROLLER)**

**SUBJECT: Audit of the Development of the P-3/Pioneer Project
(Project No. 4RC-5067)**

Introduction

We are providing this report for your information and use. We performed the audit in response to a request from former Congresswoman Leslie L. Byrne. Congresswoman Byrne requested that the Inspector General, DoD, review the actions of the Navy regarding AEROBUREAU, Incorporated (AEROBUREAU). The Congresswoman received an allegation that the Navy may have co-opted AEROBUREAU technology after the AEROBUREAU president presented a series of unsolicited proposals to the Navy that included information on the ability to downlink real-time motion video to a ground station. This report discusses the Navy's development of the P-3/Pioneer Project, which enabled the Navy to downlink real-time motion video from a P-3 aircraft to a ground station.

Audit Results

The Navy developed the P-3/Pioneer Project in accordance with applicable DoD and Navy regulations and did not co-opt AEROBUREAU technology. The Naval Air Warfare Center, Aircraft Division, Warminster, Pennsylvania, used a transmitter that has been a component of the Pioneer unmanned aerial vehicle since the mid-1980's and used the optical system on the P-3 aircraft to downlink real-time motion video from the P-3 aircraft to a Pioneer ground station.

Audit Objectives

The objective of the audit was to determine whether the Navy developed the P-3/Pioneer Project in accordance with applicable DoD and Navy regulations. Specifically, we compared the development of the P-3/Pioneer Project to a system developed by AEROBUREAU. We also reviewed the Navy's management control program as it related to the audit objective.

Scope and Methodology

Scope and Methodology. We reviewed documentation supporting the actions taken by the Navy to develop the P-3/Pioneer Project from the inception of the project in October 1993 through February 1994. We interviewed Navy officials within the offices of the Assistant Secretary of the Navy (Research, Development and Acquisition), the Chief of Naval Operations, the Naval Air Systems Command, and the Naval Air Weapons Center at Warminster, Pennsylvania, and Point Mugu, California, respectively. We also met with representatives from AAI Corporation; Pioneer UAV, Incorporated; the Aerospace Corporation; and AEROBUREAU.

We reviewed messages and memorandums prepared by personnel in the program offices involved in the P-3/Pioneer Project. We also reviewed engineering data and proposals prepared by the Navy engineers assigned to the project. In addition, we reviewed letters and documents prepared by AAI Corporation and AEROBUREAU. The Technical Assessment Division, Office of the Inspector General, DoD, provided engineering assistance to the audit team by performing an analysis of the differences and similarities between the Navy P-3/Pioneer System and the AEROBUREAU system. We did not use computer-processed data or statistical sampling procedures to develop audit conclusions.

Audit Period, Standards, and Locations. We performed this program audit from August 1994 through May 1995 in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. Enclosure 1 lists the organizations visited or contacted.

Management Control Program

DoD Directive 5010.38, "Internal Management Control Program," April 14, 1987, requires DoD organizations to implement a comprehensive system of management controls that provides reasonable assurance that programs are operating as intended and to evaluate the adequacy of the controls.

Scope of Review of the Management Control Program. We reviewed the adequacy of management controls related to the development of the P-3/Pioneer Project by the Naval Air Systems Command. We did not assess the adequacy of management's self-evaluation of those controls.

Adequacy of Management Controls. Management controls applicable to the P-3/Pioneer Project were deemed to be adequate in that we identified no material management control weaknesses.

Prior Audits and Other Reviews

No other audit coverage has occurred in the last 5 years directly related to the P-3/Pioneer Project.

Audit Background

In a memorandum dated July 19, 1994, former Congresswoman Leslie L. Byrne stated that she had received an allegation that the Navy may have used technology developed by AEROBUREAU without compensating AEROBUREAU. AEROBUREAU outfitted an aircraft with electronic equipment to create a flying newsroom and developed the television enhanced situational awareness (TESA) concept. According to AEROBUREAU, TESA is a television-based information processing and dissemination system that can be used in battlefield or crisis situations. The allegation that the Navy may have used AEROBUREAU TESA technology without compensation stems from the Navy's development of the P-3/Pioneer Project. The P-3/Pioneer Project transmits real-time motion video from a P-3 aircraft to a ground station using a transmitter taken from a Pioneer unmanned aerial vehicle. The complainant alleged that the Navy developed the P-3/Pioneer Project after the president of AEROBUREAU briefed the Navy on the AEROBUREAU aircraft and the TESA concept.

Discussion

In January 1991, the president of AEROBUREAU briefed personnel from the Office of the Secretary of Defense and the Offices of the Joint Chiefs of Staff on a system that provided inter-active gathering, analyzing, packaging, and global distribution of intelligence information in real time through the audio-visual medium. The president of AEROBUREAU presented the briefings to show the capabilities of an AEROBUREAU aircraft equipped with the TESA.

AEROBUREAU Aircraft. The basic AEROBUREAU system briefed to DoD personnel used an aircraft as the platform for all system operations. A copyrighted AEROBUREAU brochure described the aircraft as a Lockheed L-188C Electra equipped with:

- o a stabilized low-light-level optic system;
- o a side-looking airborne radar;
- o a forward-looking infrared imaging system;
- o wing-mounted, air-launched remotely piloted vehicles;

-
- o Ku-band and L-band frequency satellite communications;
 - o high-frequency, very high frequency, and ultrahigh frequency voice, video, and facsimile communications;
 - o a full video editing and processing capability;
 - o all-terrain vehicles;
 - o cross-country motorcycles; and
 - o a crew of 12 (cameramen, editors, technicians, producers, and reporters).

AEROBUREAU TESA System. Copyrighted documents provided by the president of AEROBUREAU state that the AEROBUREAU TESA system, operating on an AEROBUREAU aircraft or a similarly configured aircraft, would provide:

- o a manned, very long-range, multifunctional platform to direct the gathering and receipt of audio-visual images by a specialized array of equipment;
- o on-board analysis of gathered images and preparation of audio-visual reports by audio-visual personnel that have an understanding of intelligence-related needs;
- o on-board transmission of audio-visual reports via satellite to theater or global users; and
- o interconnectivity, permitting the user to direct image and sound-gathering equipment and to search and examine objects, personnel, and movements of interest in real time.

After initial briefings with personnel in the Office of the Secretary of Defense and the offices of the Joint Chiefs of Staff, AEROBUREAU attempted to sell its aircraft and its TESA system to the Navy. From January 1991 until October 1993, AEROBUREAU briefed various Navy program offices on the capabilities of the AEROBUREAU aircraft and the TESA system. Although Navy program officers were impressed by the capabilities of the aircraft and TESA system, none had an established requirement that would have allowed investing Navy funds in the AEROBUREAU concept.

The Pioneer System Functions and Components. Pioneer is an unmanned aerial vehicle system that can downlink motion video to ground stations. The Pioneer system is mobile and can be used for surveillance and reconnaissance

missions. It can also be used for artillery or naval gunfire adjustment and damage assessment in areas where manned aircraft cannot survive. The components of the Pioneer system include:

- o a ground control station that is used to direct the Pioneer throughout the mission;

- o a tracking communication unit that contains the vehicle communication and navigation and voice communication equipment and antennas;

- o a data link that uses a C band frequency for the uplink command channel and video and telemetry downlink;

- o a portable control station that provides the capability to control preflight, launch, and recovery operations;

- o a remote receiving station that provides real-time reception of video pictures at remote locations; and

- o payloads that can be used for television, forward-looking infrared radar, or radio relay.

The Navy first purchased the Pioneer system in 1986.

Navy P-3/Pioneer Functions and Components. The development of the P-3/Pioneer was the result of the Navy's effort to find uses for the P-3 aircraft beyond its traditional role in antisubmarine warfare. To demonstrate potential roles for the P-3 aircraft, the Navy produced a videotape that showed various ways a P-3, with onboard optic systems, could be used. The Navy showed the demonstration videotape to various senior Navy personnel. At a briefing in October 1993, a senior member of the Navy staff questioned why the Pioneer could provide real-time video to ground commanders, but the P-3 could produce only videotape action for playback at a later time or transmit individual freeze-frame pictures to a ground station. As a result of that briefing, the P-3 program office, Naval Air Systems Command, was tasked in November 1993 to find a way to enable the P-3 to downlink real-time video to tactical commanders. The tasking required that the system be compatible with existing Navy and Marine Corps receivers. After a review of the transmitter on the Pioneer and the Hawklink, the two systems that could be used to downlink real-time video from a P-3 aircraft, the P-3 program office determined that the transmitter on the Pioneer unmanned aerial vehicle was the most suitable system for incorporation into the P-3 aircraft.

In December 1993, the Naval Air Systems Command tasked the Naval Air Weapons Center, Warminster, Pennsylvania, to determine the best way to add

the Pioneer video downlink to the P-3 aircraft. The Naval Air Weapons Center, Warminster, Pennsylvania, decided to place the Pioneer transmitter in an aluminum suitcase and to use a portable antenna mount compatible with the P-3 aircraft.

The P-3/Pioneer is microwave based and is configured for the transmission of both color and black and white video imagery in full motion. The P-3/Pioneer system transmits line-of-sight imagery at various altitudes and distances from a P-3 aircraft to a Pioneer ground station. The P-3/Pioneer system is portable to allow interfacing with the imagery sensors of the various P-3 aircraft imagery systems. The portability of the P-3/Pioneer system also allows for movement from one aircraft to another to meet operational needs and to provide flexibility when aircraft problems arise. The P-3/Pioneer system has three main components: a transmitter system in an aluminum suitcase, an antenna placed in a liner and mounted in the P-3 sonobouy chute, and a receiver system. The Pioneer program office transferred a standard Pioneer transmitter to the P-3 Program Office for use in the video transmission proof of concept. Engineers at the Naval Air Weapons Center purchased the C-band frequency antenna. The Naval Air Weapons Center engineers assembled and installed the components on a P-3 aircraft. Navy pilots conducted a test flight of the P-3/Pioneer system in February 1994. The P-3/Pioneer became operational in February 1994.

Navy Video Downlink Capability. The Naval Air Warfare Center, Weapons Division, Point Mugu, California, has used motion video downlink in test and evaluation operations since the early 1980's. Although the operations were done in a test-range environment, the operations demonstrated that the Navy had the ability to downlink motion video from an aircraft before the Navy received briefings on the AEROBUREAU system.

Conclusion

The Navy's development of the P-3/Pioneer did not infringe on the property of AEROBUREAU. The Navy purchased the Pioneer unmanned aerial vehicle in 1986 and has used it since that time. The Navy engineers packaged a transmitter from a Pioneer unmanned aerial vehicle in a manner that allows it to be used to downlink motion video from a manned aircraft. The P-3/Pioneer system does not have the news bureau capabilities of the AEROBUREAU aircraft.

Management Comments

We provided a draft of this report to the addressee on May 30, 1995. Because this report contained no findings or recommendations, written comments were

not required, and none were received. Therefore, we are publishing this memorandum report in final form.

We appreciate the courtesies extended to the audit staff. For additional information on this report, please contact Mr. Charles M. Santoni, Audit Program Director, at (703) 604-9556 (DSN 664-9556) or Mr. George J. Sechiel, Audit Project Manager, at (703) 604-9559 (DSN 664-9559). We will provide a formal briefing on the results of the audit, if desired. Enclosure 2 lists the distribution of this report. The audit team members are listed inside the back cover.



Robert J. Lieberman
Assistant Inspector General
for Auditing

Enclosures

Organizations Visited or Contacted

Joint Staff

Office of the Director for Command, Control, Communication and Computer Systems,
Washington, DC

Department of the Navy

Office of the Deputy Assistant Secretary of the Navy (Air Programs), Washington, DC
Chief of Naval Operations, Washington, DC
Headquarters, Marine Corps, Washington, DC
Office of the Director, Space and Electronic Warfare, Washington, DC
Office of the Director, Air Warfare, Washington, DC
Headquarters, Naval Air Systems Command, Washington, DC
Naval Air Warfare Center, Aircraft Division, Warminster, PA
Naval Air Warfare Center, Weapons Division, Point Mugu, CA

Department of the Air Force

Air Force Materiel Command, Aeronautical Systems Center, Wright-Patterson Air
Force Base, OH
Detachment 4, 645 Materiel Squadron, Ontario, CA

Non-Government Organizations

AAI Corporation, Hunt Valley, MD
AEROBUREAU, Incorporated, McLean, VA
The Aerospace Corporation, El Segundo, CA
Pioneer UAV, Incorporated, Hunt Valley, MD

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- Senate Subcommittee on Defense, Committee on Appropriations
- Senate Committee on Armed Services
- Senate Committee on Governmental Affairs
- Senate Select Committee on Intelligence
- House Committee on Appropriations
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- House Committee on Government Reform and Oversight
- House Subcommittee on National Security, International Affairs, and Criminal
Justice, Committee on Government Reform and Oversight
- House Committee on National Security
- House Permanent Select Committee on Intelligence
- Congressman Thomas M. Davis

Non-Government Organization

AEROBUREAU, Incorporated

Audit Team Members

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