

# Department of Homeland Security **Office of Inspector General**

CBP's Use of Unmanned Aircraft Systems in the  
Nation's Border Security





**OFFICE OF INSPECTOR GENERAL**  
Department of Homeland Security

Washington, DC 20528 / [www.oig.dhs.gov](http://www.oig.dhs.gov)

MAY 30 2012

MEMORANDUM FOR: Michael C. Kostelnik  
Assistant Commissioner  
Office of Air and Marine  
U.S. Customs and Border Protection

FROM: Anne L. Richards *Anne L. Richards*  
Assistant Inspector General for Audits

SUBJECT: *CBP's Use of Unmanned Aircraft Systems in the Nation's  
Border Security*

Attached for your action is our final report, *CBP's Use of Unmanned Aircraft Systems in the Nation's Border Security*. We incorporated the formal comments from the U.S. Customs and Border Protection (CBP) in the final report.

The report contains four recommendations aimed at improving CBP's use of unmanned aircraft systems in the Nation's border security. Your office concurred with all four recommendations. As prescribed by the Department of Homeland Security Directive 077-1, Follow-Up and Resolutions for the Office of Inspector General Report Recommendations, within 90 days of the date of this memorandum, please provide our office with a written response that includes your (1) agreement or disagreement, (2) corrective action plan, and (3) target completion date for each recommendation. Also, please include responsible parties and any other supporting documentation necessary to inform us about the current status of the recommendation. Until your response is received and evaluated, the recommendations will be considered open and unresolved.

Consistent with our responsibility under the *Inspector General Act*, we are providing copies of our report to appropriate congressional committees with oversight and appropriation responsibility over the Department of Homeland Security. We will post the report on our website for public dissemination

Please call me with any questions, or your staff may contact John E. McCoy II, Deputy Assistant Inspector General for Audits, at (202) 254-4100.

Attachment



## Table of Contents

Executive Summary .....	1
Background .....	2
Results of Review .....	3
CBP Needs To Improve Planning of Its UAS Program To Maximize Operations ....	3
Recommendations .....	7
Management Comments and OIG Analysis .....	8

## Appendixes

Appendix A: Objectives, Scope, and Methodology.....	11
Appendix B: Management Comments to the Draft Report .....	13
Appendix C: DHS OIG Estimated Computation of Mission Availability.....	16
Appendix D: Major Contributors to This Report .....	17
Appendix E: Report Distribution .....	18

## Abbreviations

CBP	U.S. Customs and Border Protection
DHS	U.S. Department of Homeland Security
FY	fiscal year
FEMA	Federal Emergency Management Agency
ICE	U.S. Immigration and Customs Enforcement
NASOC	National Air Security Operations Center
NOAA	National Oceanic and Atmospheric Administration
OAM	Office of Air and Marine
OIG	Office of Inspector General
RSTA	reconnaissance, surveillance, targeting, and acquisition
UAS	unmanned aircraft system



## **Executive Summary**

We conducted a review of U.S. Customs and Border Protection (CBP) actions to establish its unmanned aircraft systems program. The purpose of the program is to provide reconnaissance, surveillance, targeting, and acquisition capabilities across all CBP areas of responsibility. Our objective was to determine whether CBP has established an adequate operation plan to define, prioritize, and execute its unmanned aircraft mission.

CBP had not adequately planned resources needed to support its current unmanned aircraft inventory. Although CBP developed plans to use the unmanned aircraft's capabilities in its Office of Air and Marine mission, its Concept of Operations planning document did not adequately address processes (1) to ensure that required operational equipment, such as ground control stations and ground support equipment, is provided for each launch and recovery site; (2) for stakeholders to submit unmanned aircraft mission requests; (3) to determine how mission requests are prioritized; and (4) to obtain reimbursement for missions flown on stakeholders' behalf. This approach places CBP at risk of having invested substantial resources in a program that underutilizes resources and limits its ability to achieve Office of Air and Marine mission goals.

CBP needs to improve planning of its unmanned aircraft system program to address its level of operation, program funding, and resource requirements, along with stakeholder needs. We made four recommendations that will aid CBP in maximizing the use of unmanned aircraft. CBP management concurred with all four recommendations.



## **Background**

The mission of the Office of Air and Marine (OAM) is to protect the American people and the Nation's critical infrastructure through the coordinated use of integrated air and marine forces. Air and marine forces are used to detect, interdict, and prevent acts of terrorism and the unlawful movement of people, illegal drugs, and other contraband toward or across U.S. borders. The unmanned aircraft system (UAS) provides command, control, communication, intelligence, surveillance, and reconnaissance capability to complement crewed aircraft and watercraft, and ground interdiction agents. A UAS is composed of a long-endurance, medium-altitude remotely piloted aircraft, ground control station, ground data terminal, data and voice communications, and other ground support equipment required to operate and maintain the system. UASs provide reconnaissance, surveillance, targeting, and acquisition (RSTA) capabilities across all CBP areas of responsibility.

CBP began UAS operations in fiscal year (FY) 2004 with a pilot study conducted by the Office of Border Patrol to determine the feasibility of using UASs in the southwest border region. The pilot study proved the UAS was successful in providing RSTA and actionable intelligence to Border Patrol ground agents. In addition, the study concluded that UASs provided unique law enforcement capabilities, such as the ability to carry a variety of sensors and payloads and to remain airborne for extended periods without the limitations imposed by requiring onboard pilots. CBP has since expanded UAS operations to the Caribbean, gulf, and northern border regions.

CBP reported that, subsequent to the FY 2004 pilot, Congress appropriated approximately \$240.6 million to establish a UAS program within CBP. CBP also reported that it has expended \$152.3 million to purchase nine aircraft and related equipment. CBP had seven operational aircraft during our review. CBP received two additional aircraft in late 2011. CBP was awaiting delivery of a tenth aircraft purchased with FY 2011 funds. Each aircraft system costs approximately \$18 million. In June 2011, CBP had 23 pilots who were capable of launching and recovering unmanned aircraft. UAS missions are launched and recovered from National Air Security Operation Centers (NASOCs) in Sierra Vista, Arizona; Corpus Christi, Texas; Cocoa Beach, Florida; and Grand Forks, North Dakota. An unmanned aircraft mission crew generally consists of a Command Duty Officer, Pilot-in-Command, Sensor Operator, and one or more contract technicians. Figure 1 shows a Predator B aircraft with the maritime radar enhancement.



Figure 1. Guardian, the maritime variant of the Predator B.  
Source: CBP Sierra Vista, Arizona, NASOC

## Results of Review

### **CBP Needs To Improve Planning of Its UAS Program To Maximize Operations**

CBP had not adequately planned for resources needed to support the current unmanned aircraft inventory. Although CBP developed plans to utilize the unmanned aircraft's capabilities in its OAM mission, its Concept of Operations planning document did not adequately address processes (1) to ensure that required operational equipment, such as ground control stations and ground support equipment, is available for each launch and recovery site; (2) for stakeholders to submit unmanned aircraft mission requests; (3) to determine how mission requests are prioritized; and (4) to obtain reimbursement for missions flown on stakeholders' behalf. This approach places CBP at risk of having invested substantial resources in a program that underutilizes resources and limits its ability to achieve OAM mission goals.

### **Resource Planning**

CBP has not ensured that adequate resources are available to effectively operate its unmanned aircraft. CBP's Strategic Plan requires the agency to develop and implement a planning framework to incorporate investment, resource, and program management processes to ensure that CBP can acquire and effectively manage its resources. The plan requires CBP to accomplish its high-priority missions and objectives in a way that maximizes return on investment. CBP procured unmanned aircraft before implementing adequate plans to do the following:



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### Department of Homeland Security

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- Achieve the desired level of operation;
- Acquire sufficient funding to provide necessary operations, maintenance, and equipment; and
- Coordinate and support stakeholder needs.

#### **UAS Level of Operation**

CBP has not achieved its scheduled nor desired levels of flight hours of its unmanned aircraft. The Office of Inspector General (OIG) estimates that, based on the contract performance specifications, seven UASs should support 10,662 flight hours per year to meet the mission availability threshold (minimum capability) and 13,328 flight hours to meet the mission availability objective (desired capability). However, resource shortfalls of qualified staff and equipment coupled with restrictions imposed by the Federal Aviation Administration, weather, host airfields, and others have resulted in CBP scheduling just 7,336 flight hours for its seven unmanned aircraft and limited actual flight hours to 3,909 hours. This usage represents 37 percent of the unmanned aircraft's mission availability threshold and 29 percent of its mission availability objective. Despite the current underutilization of unmanned aircraft, CBP received two additional aircraft in late 2011 and was awaiting delivery of a tenth aircraft in 2012. See appendix C for mission availability threshold and objective computations.

#### **Funding of Operations and Maintenance**

CBP reported that, since the UAS program's inception, Congress has appropriated a total of \$12.6 million for operations and maintenance. The operations and maintenance funding category includes training, satellite links, facility rental, and contractor support. CBP also reported that from FY 2006 through FY 2011, it expended \$55.3 million for operations and maintenance, but has not made a specific operations and maintenance budget request for the UAS program. This has resulted in a budget shortfall. According to CBP, it was required to transfer approximately \$25 million from other programs in FY 2010 to address operations and maintenance funding shortfalls. As a result of CBP's insufficient funding approach, future UAS missions may have to be curtailed.



## OFFICE OF INSPECTOR GENERAL

Department of Homeland Security

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### Funding of Equipment

CBP has not adequately planned to fund unmanned aircraft-related equipment. The procurement funding category includes aircraft and related equipment, such as ground control stations, ground support equipment, cameras, and navigation systems. This approach has resulted in insufficient equipment to perform UAS missions. For example:

- Corpus Christi NASOC received a maritime version of the Predator aircraft, which was placed in service in February 2011, but Corpus Christi did not receive a compatible ground control station. As a result, the Corpus Christi NASOC was not initially able to use the system's SeaVue maritime radar capability. However, Cocoa Beach NASOC transferred its backup ground control station to Corpus Christi to facilitate mission operations. A compatible ground control station is expected to be delivered in May 2012. This transfer was required because Corpus Christi was not designed for launch and recovery operations.
- On at least three occasions, NASOC Grand Forks could not conduct flight operations because maintenance could not be performed due to lack of ground support equipment. One aircraft was down for 4 days in January 2011 due to lack of wing-jacks and 3 days in February due to lack of go-jacks and fuselage stands. Another aircraft was down for 2 days in February 2011 due to lack of go-jacks and fuselage stands. Ground support equipment must be transferred from one NASOC to another because each NASOC does not have its own equipment.
- CBP does not have an adequate number of ground control stations to ensure safe operations. CBP's *MQ-9 Supplement to the Aviation Operations Handbook* requires a permanent ground control station and a mobile ground control station for the safe operation of unmanned aircraft. The handbook requires NASOC directors to submit written requests for relief from any provision of the handbook to the Executive Director of Test, Training, Safety, and Standards. At the time of our fieldwork, three of four NASOCs were operating without the required mobile backup ground control stations. However, only one of four NASOCs was granted a waiver to operate without this equipment.



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Department of Homeland Security

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### Stakeholder Needs

CBP's planning has not adequately addressed coordination and support of stakeholders. Although CBP identified stakeholders and has flown missions on their behalf, it has not implemented a formal process for stakeholders to submit mission requests and has not implemented a formal procedure to determine how mission requests are prioritized. It also does not have agreements with exterior stakeholders for reimbursement of mission costs.

An OAM manager and stakeholders we interviewed said that CBP had flown missions to support the following stakeholders:

- Department of Homeland Security (DHS) agencies, including Office of Border Patrol, United States Secret Service, Federal Emergency Management Agency (FEMA), and Immigration and Customs Enforcement (ICE);
- Bureau of Land Management;
- Federal Bureau of Investigation;
- Department of Defense;
- Texas Rangers;
- United States Forest Service; and
- National Oceanic and Atmospheric Administration (NOAA).

Also, OAM management and stakeholders we interviewed discussed the following examples of missions performed by the UAS program:

- Provided NOAA with videos of dams, bridges, levees, and riverbeds where flooding occurred or was threatened;
- Provided FEMA with video/radar images of flooding;
- Provided surveillance over a suspected smuggler's tunnel, which yielded information that, according to an ICE representative, would have required many cars and agents to obtain;
- Provided radar mapping, or overlying radar images taken a few days apart, to show changes in location of flooding, allowing the National Guard to deploy high-water vehicles and sandbags to where they were most needed;



## OFFICE OF INSPECTOR GENERAL

Department of Homeland Security

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- At the request of the State Department, participated in discussions with another country on the use of unmanned aircraft;
- Participated in joint efforts with the U.S. Army to leverage capabilities of unmanned aircraft and test new technology; and
- Participated in efforts to establish a quarterly forum to share lessons learned with the Air Force and other government agencies.

Stakeholders we interviewed from NOAA, ICE, FEMA, and the Army National Guard were generally satisfied with support provided by the UAS program. However, they were unaware of a formal process to request UAS support and of how CBP prioritizes missions. CBP included a process to satisfy requests for UAS support in its *Concept of Operations for CBP's Predator B Unmanned Aircraft System, FY 2010 Report to Congress*, but this process was not implemented. Instead, tasking decisions are usually made by the Director of Air Operations at the NASOC with responsibility for the area of the stakeholder surveillance requirement. Missions are requested by various means, including from headquarters, Border Patrol agents, local law enforcement agencies, and other Federal agencies. We interviewed four stakeholders, three of whom recommended a standardized process to request UAS missions. A standardized process would provide transparency and ensure that requests are processed in a timely, predictable manner. This process would allow stakeholders to better plan their operations to meet mission needs.

*The Robert T. Stafford Disaster Relief and Emergency Assistance Act*, as amended, provides a system by which a Presidential disaster declaration of an emergency triggers financial assistance through FEMA. CBP seeks reimbursement for services provided to FEMA under this Act since Federal agencies may be reimbursed for expenditures from the Act's appropriations. However, CBP does not have agreements to obtain reimbursement for missions flown on behalf of other stakeholders. When appropriate and authorized by law, obtaining reimbursement for such missions would provide additional funding needed for staff, operations and maintenance, and essential equipment.

### **Recommendations**

We recommend that the Assistant Commissioner, Office of Air and Marine:



## OFFICE OF INSPECTOR GENERAL

Department of Homeland Security

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### **Recommendation #1:**

Analyze requirements and develop plans to achieve the UAS mission availability objective and acquire funding to provide necessary operations, maintenance, and equipment.

### **Recommendation #2:**

Develop and implement procedures to coordinate and support stakeholders' mission requests.

### **Recommendation #3:**

Establish interagency agreements with external stakeholders for reimbursement of expenses incurred fulfilling mission requests where authorized by law.

### **Recommendation #4:**

Postpone additional UAS purchases until recommendation #1 has been implemented.

### **Management Comments and OIG Analysis**

CBP submitted formal comments to our report, and a copy of its response is included as appendix B. CBP also provided technical comments, and we have made changes to the report based on those comments. Additionally, CBP concurred with all recommendations, and our analysis of its concurrence follows.

**Recommendation #1:** Analyze requirements and develop plans to achieve the UAS mission availability objective and acquire funding to provide necessary operations, maintenance, and equipment.

**Management Response:** CBP stated that it has established the Strategic Air and Marine Plan, which defines its planned UAS acquisition and sustainment over the next 5 years. This plan is based on the Concept of Operations and Operations Requirements Documents, which define the specific capabilities needed to achieve assigned homeland security missions. CBP added that funding requests are developed to support the UAS portion of the Strategic Air and Marine Plan; however, the actual funding is subject to changing Department and Agency criteria.



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Department of Homeland Security

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**OIG Analysis:** CBP's comments do not appear to address the recommendation, which will remain open and unresolved until CBP provides specific documentation that details how it plans to achieve the UAS mission availability objective and acquire funding to provide necessary operations, maintenance, and equipment.

**Recommendation #2:** Develop and implement procedures to coordinate and support stakeholders' mission requests.

**Management Response:** CBP stated that it has implemented flexible and responsive procedures to coordinate and support stakeholders' requests for deployment of the UAS when deemed appropriate.

**OIG Analysis:** CBP comments appear to be responsive to this recommendation, which will remain open and unresolved until the OIG has received and evaluated the written procedures to coordinate and support stakeholders' mission requests.

**Recommendation #3:** Establish interagency agreements with external stakeholders for reimbursement of expenses incurred fulfilling mission requests where authorized by law.

**Management Response:** CBP stated that efforts are under way at DHS to address the issue of reimbursement for expenses incurred fulfilling external UAS missions, and there are procedures for reimbursement for mission sets that fall outside the normal scope. CBP also stated that it currently establishes interagency agreements with government agency partners for resourcing efforts that fall outside the scope of normal mission sets. This typically involves using CBP unmanned aircraft to demonstrate new technologies, capabilities, and tactics.

**OIG Analysis:** CBP comments appear to be responsive to the recommendation, which will remain open and unresolved until the OIG has received and evaluated the corrective action plan developed by DHS that addresses how CBP will obtain reimbursement for expenses incurred fulfilling mission request where authorized by law.

**Recommendation #4:** Postpone additional UAS purchases until recommendation #1 has been implemented.



## OFFICE OF INSPECTOR GENERAL

Department of Homeland Security

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**Management Response:** CBP stated that it currently has no plan to expand the UAS fleet beyond the 10 systems already in operation or on order, unless directed to do so by higher authority.

**OIG Analysis:** CBP comments do not fully address the intent of the recommendation, because it indicated there are no plans to expand the UAS fleet unless directed by higher authority. The recommendation will remain open and unresolved until the OIG has received and evaluated the corrective action plan related to recommendation #1.



## **Appendix A**

### **Objectives, Scope, and Methodology**

The DHS OIG was established by the *Homeland Security Act of 2002* (Public Law 107-296) by amendment to the *Inspector General Act of 1978*. This is one of a series of audit, inspection, and special reports prepared as part of our oversight responsibilities to promote economy, efficiency, and effectiveness within the Department.

Our review objective was to determine whether CBP has established an adequate operation plan to define, prioritize, and execute its UAS mission. To accomplish our objective, we reviewed CBP policies, procedures, and plans to establish the UAS program, including the UAS Mission Needs Statement, Operation Requirements Document, Acquisition Plan for the CBP Strategic Air and Marine Plan, Strategic Implementation Plan, and Concept of Operations.

We conducted analysis related to planning and operation of the UAS program. We also observed operations at the Air and Marine Operations Center in Riverside, California; the Joint Field Command in Tucson, Arizona; and the National Air Security Operation Centers in Cocoa Beach, Florida, and Sierra Vista, Arizona.

We reviewed Office of Air and Marine plans to establish performance management for the UAS program in the *Concept of Operations for CBP's Predator B Unmanned Aircraft System* and *Office of Air and Marine Strategic Implementation Plan*. We also reviewed the *FY 2009–2014 Strategic Plan* and the framework detailed in the *Summary of Performance and Financial Information Fiscal Year 2010*. We reviewed pertinent laws and regulations, including the DHS Acquisition Management Directive and best practices of the Project Management Institute.

To gain an understanding of internal control that is significant within the context of the review objective, we interviewed representatives from OAM's National Air Security Operations; Mission Support; Budget Formulation; Budget Execution; UAS Acquisitions; and Training, Safety and Standards. We also interviewed stakeholders from FEMA, NOAA, ICE, and the North Dakota Army National Guard. We reviewed funding, costs, and operation records, including congressional appropriations, contract actions, flight and maintenance logs, property records, and expenditures incurred to transfer equipment and crew to meet mission requirements. We observed CBP's accounting system, including reports of purchase orders and funded contracts.



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We conducted this review under the authority of the *Inspector General Act of 1978*, as amended, and according to the Quality Standards for Inspections issued by the Council of the Inspectors General on Integrity and Efficiency.



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**Appendix B**  
**Management Comments to the Draft Report**

1300 Pennsylvania Avenue NW  
Washington, DC 20229



**U.S. Customs and  
Border Protection**

April 4, 2012

Charles K. Edwards  
Acting Inspector General  
Department of Homeland Security  
245 Murray Drive, SW, Building 410  
Washington, DC 20528

Re: OIG Draft Report Entitled, "CBP's Use of Unmanned Aircraft Systems in the Nation's Border Security – For Official Use Only" OIG Project Number 11-023-AUD-CBP (OIG-11-088-AUD-CBP)

Dear Mr. Edwards:

Thank you for the opportunity to review and comment on this draft report. U.S. Customs and Border Protection (CBP) appreciates the Office of Inspector General's (OIG's) work in planning and conducting its review and issuing this report.

CBP is pleased to note the OIG's acknowledgement of its Concept of Operations and other planning documents to utilize the unmanned aircrafts' capabilities in its missions. CBP is also pleased the OIG recognized its missions performed for a wide range of stakeholders, and included the general satisfaction of these customers with the support provided.

The OIG addressed four recommendations to the Assistant Commissioner, Office of Air and Marine.

**Recommendation 1:** Analyze requirements and develop plans to achieve the Unmanned Aircraft Systems (UAS) mission availability objective and acquire funding to provide necessary operations, maintenance, and equipment.

**CBP Response:** CBP concurs and has plans in place that achieve the recommendation. The Strategic Air and Marine Plan (StAMP) clearly defines CBP's planned UAS acquisition and sustainment over the next five years and beyond. This plan is based on detailed operational plans, known as Concept of Operations (CONOPS), which are crafted by operations personnel and are based on known and projected requirements. Each aircraft element of the StAMP is supported by an Operations Requirements Document (ORD) that defines the specific capabilities needed to achieve assigned homeland security missions. From these requirements, mission support personnel establish the infrastructure that will be needed to allow CBP agents to accomplish their mission. These documents are evaluated and revised as needed to reflect changing roles, resources, and missions.



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Funding requests are developed to support the UAS portion of the StAMP, but the actual funding provided to the program is subject to changing Department and Agency criteria. CBP will continue to request adequate funding based on known and projected operational requirements while judiciously utilizing available resources to accomplish CBP's mission.

**Due Date:** CBP has approved StAMP, CONOPS, and ORD documents that guide the funding requests that support operations, maintenance, and equipment funding requests. While these documents are continuously evaluated and revised to address changes in threats, the documents sufficiently address the current plan for the future state for the UAS Program. CBP respectfully requests the OIG close Recommendation 1.

**Recommendation 2:** Develop and implement procedures to coordinate and support stakeholders' mission requests.

**CBP Response:** CBP concurs with Recommendation 2 and continues to implement flexible and responsive procedures to coordinate and support stakeholders' requests, to include requests when the UAS is the most appropriate asset to meet these needs. External requests are received via email to specific group accounts designed to capture stakeholder requests. These requests are reviewed by CBP mission and intelligence planners, and contain detailed information that enables CBP to assess the request for urgency, breadth, and type of information required. Taking these elements into consideration, CBP collection planners assess which resource options are most viable to support stakeholder requirements based on asset capability, availability, effectiveness, and impact; CBP mission and intelligence planners then coordinate with the appropriate stakeholders and operational asset managers to schedule the operation. Internal stakeholders are also afforded a mechanism to submit requirements online via a CBP intranet site managed by the Office of Intelligence and Investigative Liaison. Unplanned, time-sensitive requests may be received via phone or tactical radio. Requirements that cannot be sufficiently supported with regionally deployed assets are forwarded to CBP Headquarters for prioritization and coordination across its national architecture. Feedback may be sought following collection to determine whether stakeholder mission requirements were satisfied.

**Due Date:** CBP has implemented, and will continuously refine, its processes to coordinate and support stakeholders' mission requests. CBP respectfully requests the OIG close Recommendation 2.

**Recommendation 3:** Establish interagency agreements with external stakeholders for reimbursement of expenses incurred fulfilling mission requests where authorized by law.

**CBP Response:** CBP concurs with the intent of the recommendation, which is to establish an approach and procedure for reimbursement. There are already ongoing efforts within the Department of Homeland Security to address this issue. CBP establishes interagency agreements (IAs) with government agency partners for resourcing



## OFFICE OF INSPECTOR GENERAL

Department of Homeland Security

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efforts that fall outside the scope of our normal mission sets. These typically involve utilizing CBP unmanned aircraft to demonstrate new technologies, capabilities, and tactics. In the case of the Federal Emergency Management Agency, who has frequently requested CBP UAS support, we have established a process where we receive reimbursement through a Mission Assignment document. IAs are labor intensive and are only executed where required.

**Recommendation 4:** Postpone additional UAS purchases until recommendation #1 has been implemented.

**CBP Response:** In alignment with Federal Acquisition Regulations and Department requirements, CBP concurs that appropriate plans are necessary prior to acquisitions. Per the response to Recommendation 1, CBP has completed appropriate planning and mission definition to justify the strategic future state for the UAS Program. Changing threats will require that the planning and assessments continue. CBP currently has no plan to expand the UAS fleet beyond the 10 systems already in operation or on order, unless directed to do so by higher authority.

**Due Date:** Given that CBP's position is that it has fulfilled the requirements for Recommendation 1, CBP respectfully requests the OIG close Recommendation 4.

General comments that relate to statements that need to be clarified prior to finalization of the report have been submitted under separate cover.

We look forward to working with you on future reviews. If you have any questions, please have a member of your staff contact Jennifer Topps, Audit Liaison, Office of Internal Affairs at (202) 325-7713.

Sincerely,

A handwritten signature in blue ink, which appears to read "James F. Tomsheck", is positioned above the printed name.

James F. Tomsheck  
Assistant Commissioner  
Office of Internal Affairs



## **Appendix C**

### **DHS OIG Estimated Computation of Mission Availability**

The performance specifications contract of the Predator B provides that the aircraft should be capable of flying 20-hour missions. According to CBP, the UAS program operates an estimated 238 days a year. CBP's mission availability performance specifications establish the threshold (minimum) at 16 hours, 4 days per week, and the objective (desired) at 16 hours, 5 days per week. According to the contract, it is the intent of the Government to acquire UASs, equipment, and services that meet or exceed threshold (minimum) requirements, and where practical, the UASs and services should satisfy objective (desired) requirements.

The maintenance engineer said that, on average, the Predator B requires 1 hour of maintenance for every flight hour. Thus, the mission availability threshold and objective for seven aircraft operating an estimated 238 days per year are computed as follows:

#### **DHS OIG Estimate of Mission Availability Threshold**

$7 \text{ aircraft} \times 16 \text{ hours} \times 238 \text{ days} \times 80\% [4 \text{ days per week}] \times 50\% \text{ maintenance} = 10,662 \text{ hours}$

#### **DHS OIG Estimate of Mission Availability Objective**

$7 \text{ aircraft} \times 16 \text{ hours} \times 238 \text{ days} [5 \text{ days per week}] \times 50\% \text{ maintenance} = 13,328 \text{ hours}$

For the 12 months ended June 2011, CBP scheduled 7,336 flight hours with seven aircraft, one of which was placed in operation February 2011. Due to weather and other circumstances, actual flight hours were limited to 3,909 hours.



## **Appendix D**

### **Major Contributors to This Report**

Alexander Best, Director  
Mark Ferguson, Audit Manager  
Kathleen Hyland, Auditor  
Ignacio Yanes, Program Analyst  
Cory Upmeyer, Program Analyst  
David DeHaven, Independent Referencer



## **Appendix E**

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