

**U.S. Customs and Border
Protection's Unmanned
Aircraft System Program Does
Not Achieve Intended Results
or Recognize All Costs of
Operations**





HIGHLIGHTS

U.S. Customs and Border Protection's Unmanned Aircraft System Program Does Not Achieve Intended Results or Recognize All Costs of Operations

December 24, 2014

Why We Did This

We conducted this audit to determine the effectiveness and cost of the Unmanned Aircraft System program, in which U.S. Customs and Border Protection (CBP) has invested significant funds.

What We Recommend

We made four recommendations to conduct an independent study before acquiring more unmanned aircraft, lift the limitations on radar sensor operations, establish attainable goals and performance measures, and gather and report all program costs.

For Further Information:

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What We Found

Although CBP's Unmanned Aircraft System program contributes to border security, after 8 years, CBP cannot prove that the program is effective because it has not developed performance measures. The program has also not achieved the expected results. Specifically, the unmanned aircraft are not meeting flight hour goals, and we found little or no evidence CBP has met its program expectations. We estimate it costs \$12,255 per flight hour to operate the program; CBP's calculation of \$2,468 per flight hour does not include all operating costs. By not recognizing all operating costs, CBP cannot accurately assess the program's cost effectiveness or make informed decisions about program expansion. In addition, Congress and the public may be unaware of all the resources committed to the program. As a result, CBP has invested significant funds in a program that has not achieved the expected results, and it cannot demonstrate how much the program has improved border security. The \$443 million CBP plans to spend on program expansion could be put to better use by investing in alternatives.

CBP Response

CBP concurred with one recommendation and concurred in principle with the remaining three recommendations.



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Abbreviations

CBP	U.S. Customs and Border Protection
CONOPS	Concept of Operations
DHS	Department of Homeland Security
FY	fiscal year
GSA	General Services Administration
JFC	Joint Field Command
OAM	Office of Air and Marine
OCRSO	Office of the Chief Readiness Support Officer
OIG	Office of Inspector General
OIIL	Office of Intelligence and Investigative Liaison
OMB	Office of Management and Budget
UAS	Unmanned Aircraft System
USBP	U.S. Border Patrol
VADER	Vehicle and Dismount Exploitation Radar



Executive Summary

U.S. Customs and Border Protection (CBP) guards nearly 7,000 miles of U.S. land border and 2,000 miles of coastal waters surrounding Florida, Texas, and southern California. CBP's Office of Air and Marine uses air assets, including unmanned aircraft to patrol the borders, conduct surveillance, and assess disaster damage. The objective of our audit was to determine the effectiveness and cost of CBP's Unmanned Aircraft System program.

Although CBP's Unmanned Aircraft System program contributes to border security, after 8 years, CBP cannot prove that the program is effective because it has not developed performance measures. The program has also not achieved the expected results. Specifically, the unmanned aircraft are not meeting flight hour goals. Although CBP anticipated increased apprehensions of illegal border crossers, a reduction in border surveillance costs, and improvement in the U.S. Border Patrol's efficiency, we found little or no evidence that CBP met those program expectations. CBP also planned to use unmanned aircraft to operate a radar sensor over the southwest border to increase awareness and analyze surveillance gaps, but sensor operations have been limited. In addition, the unmanned aircraft do not operate along the entire southwest border as has been reported.

We estimate that, in fiscal year 2013, it cost at least \$62.5 million to operate the program, or about \$12,255 per hour. The Office of Air and Marine's calculation of \$2,468 per flight hour does not include operating costs, such as the costs of pilots, equipment, and overhead. By not including all operating costs, CBP also cannot accurately assess the program's cost effectiveness or make informed decisions about program expansion. In addition, unless CBP fully discloses all operating costs, Congress and the public are unaware of all the resources committed to the Unmanned Aircraft System program. As a result, CBP has invested significant funds in a program that has not achieved the expected results, and it cannot demonstrate how much the program has improved border security.

Given the cost of the Unmanned Aircraft System program and its unproven effectiveness, CBP should reconsider its plan to expand the program. The \$443 million that CBP plans to spend on program expansion could be put to better use by investing in alternatives, such as manned aircraft and ground surveillance assets.

We made four recommendations to put limited funds to better use, improve border security, demonstrate program effectiveness, and improve program transparency.



Background

CBP guards nearly 7,000 miles of U.S. land border and 2,000 miles of coastal waters surrounding Florida, Texas, and southern California. To accomplish its mission, CBP's Office of Air and Marine (OAM) uses a variety of air assets to patrol the borders, conduct surveillance, and assess disaster damage. The air assets include helicopters, fixed-wing aircraft, and Predator B unmanned aircraft. The Unmanned Aircraft System (UAS) program includes Predator B aircraft, as well as ground control stations, pilots, sensor operators, video cameras, land and maritime radar, and communication equipment.

CBP began UAS operations in fiscal year (FY) 2004 with a pilot study to determine the feasibility of using UAS along the southwest border of the United States. The study concluded that the unmanned aircraft could carry sensors and equipment and remain airborne for longer periods than CBP's manned aircraft. CBP reported that, from FYs 2005 to 2013, it obligated about \$360 million for the purchase of unmanned aircraft and related equipment, and for personnel, maintenance, and support. At the time of our audit, CBP had a fleet of 10 unmanned aircraft.¹ Five were configured for land missions, two for maritime missions, and three could operate over both land and water.



Figure 1: Predator B Unmanned Aircraft
Source: CBP Photo

Predator B Capabilities

- 20 hours of possible flight time
- Speed of 276 miles per hour
- Altitude of 50,000 feet
- Carry 1.9 tons of equipment

CBP's long-term plan, which is approved by CBP's Chief Procurement Officer, include adding 14 more unmanned aircraft to its fleet to be able to respond to a major event anywhere in the United States within 3 hours and provide first responders with real-time information and imagery. In October 2012, OAM proposed adding about \$443 million to the existing support and maintenance contract for its unmanned aircraft to acquire, support, and maintain the additional 14 aircraft. The proposed acquisition of 14 more aircraft would bring

¹ In total, CBP has purchased 11 unmanned aircraft for the UAS program, but 1 crashed in April 2006 and another crashed in January 2014.



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CBP's investment in the UAS program (aircraft, equipment, maintenance, and support) to more than \$802 million.

Since program inception, OAM has expanded UAS operations beyond the southwest border of the United States to the northern border, the Caribbean, the Gulf of Mexico, and the southern California coast. At the time of our audit, OAM launched its Predator B aircraft from bases in Corpus Christi, Texas; Cocoa Beach, Florida; Grand Forks, North Dakota; and Sierra Vista, Arizona.

The UAS program contributes to border security by providing information to U.S. Border Patrol (USBP) agents and other agencies. For example, UAS operations in Arizona provide border patrol stations with real-time information on the location of suspected illegal border crossings by people on foot or in vehicles. Other UAS missions collect information on intelligence targets.

Each unmanned aircraft carries a video camera that can provide images of people, vehicles, and buildings. Video images can be taken day and night and are transmitted in real time to personnel on the ground. Additionally, two unmanned aircraft in Arizona can carry a Vehicle and Dismount Exploitation Radar (VADER) to detect people and vehicles. When VADER detects a suspected target, a sensor operator uses the video camera to confirm and observe the activity. The sensor operator can then give the location of activity to border patrol agents. In addition, according to CBP, it employs personnel to analyze data obtained by VADER.

Some unmanned aircraft carry a Synthetic Aperture Radar that captures still images. According to CBP, it can use the images to confirm USBP's conclusions about activity in an area. For example, images from the Synthetic Aperture Radar may show tire tracks or footprints in areas where previous images from the sensor showed no activity. The maritime aircraft carry radar that can detect vessels on the ocean.

CBP has conducted some UAS operations for other Department of Homeland Security (DHS) components, as well as Federal, state, and local law enforcement agencies, such as the Federal Emergency Management Agency, U.S. Immigration and Customs Enforcement's Homeland Security Investigations Directorate, Federal Bureau of Investigation, Minnesota Department of Natural Resources, and the Texas Department of Public Safety.

According to OAM, it has achieved other milestones identified in its 2010 UAS Concept of Operations (CONOPS). These milestones, some which have been achieved ahead of the forecasted timeframe, include supporting a full range of mission sets; operating over land borders and over coastal waters and international waters; working with the Federal Aviation Administration to



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expand access to the National Airspace System; performing capabilities, including operation of interchangeable sensor payloads and long endurance missions; serving as a test platform for other agency technology projects; and modernizing the OAM UAS through block upgrades.

Results of Audit

Although CBP's UAS program contributes to border security, after 8 years, CBP cannot prove its effectiveness because it has not established verifiable performance measures. In addition, the program has not achieved its expected level of operation. Specifically:

- The unmanned aircraft are not meeting OAM's goal of being airborne 16 hours a day, every day of the year; in FY 2013, the aircraft were airborne 22 percent of the anticipated number of hours.
- The extent of increased apprehensions of illegal border crossers is uncertain, but compared to CBP's total number of apprehensions, OAM attributed relatively few to unmanned aircraft operations.
- OAM cannot demonstrate that the unmanned aircraft have reduced the cost of border surveillance.
- OAM expected the unmanned aircraft would be able to respond to motion sensor alerts and thus reduce the need for USBP response, but we found few instances of this having occurred.
- VADER's restricted operation over only a section of the Arizona border, rather than its anticipated operation over New Mexico, Texas, and a larger section of the Arizona border, has limited CBP's ability to use the sensor to analyze surveillance gaps.

In addition, the unmanned aircraft are not operating along the entire southwest border of the United States, as DHS has reported.

We estimate that, in FY 2013, it cost at least \$62.5 million to operate the program, or about \$12,255 per hour. Although it may be useful for internal purposes, OAM's calculation of \$2,468 per flight hour does not include operating costs such as the costs of pilots, equipment, and overhead. As a result, CBP has invested significant funds in a program that has not achieved the expected results, and it cannot demonstrate how much the program has improved border security.

Effectiveness of the UAS Program

Although CBP's UAS program contributes to border security, its effectiveness cannot be fully evaluated because CBP has not established verifiable performance measures. According to program-related



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documents, such as the UAS CONOPS and the UAS Mission Need Statement, expectations included 16-hour flights 7 days a week, increased apprehensions, reduced surveillance costs, improved USBP efficiency, and the ability to analyze surveillance gaps in Arizona, New Mexico, and Texas. A comparison of these documented program expectations with current operations shows that the UAS program is not meeting these objectives. In addition, DHS reported that UAS operations covered the entire southwestern U.S. land border. However, operations focus on relatively small sections of the border.

UAS Flight Hours

According to OAM's UAS CONOPS, by FY 2013, OAM anticipated four 16-hour unmanned aircraft patrols every day of the year, or 23,296 total flight hours.² However, the unmanned aircraft logged a combined total of 5,102 flight hours, or about 80 percent less than what OAM anticipated. According to OAM, the aircraft did not fly more primarily because of budget constraints, which prevented OAM from obtaining the personnel, spare parts and other infrastructure for operations, and maintenance necessary for more flight hours. Other contributing factors included flight restrictions and weather-related cancellations. OAM does not operate the unmanned aircraft in certain weather conditions, such as thunderstorms, high winds, or when there is cloud cover. Because of these weather-related limitations alone, OAM's long-term goal of unmanned aircraft operations 24 hours a day, 7 days a week is unrealistic and not attainable.

OAM's inability to achieve the anticipated number of flight hours for its unmanned aircraft is a persistent concern. We reached similar conclusions in our May 2012 audit report on the UAS program.³

Apprehensions

It is not possible to determine to what extent using unmanned aircraft increased apprehensions of illegal border crossers. When compared to USBP's total number of reported apprehensions, however, OAM attributed relatively few to use of unmanned aircraft. Table 1 shows the number of apprehensions in FY 2013 that OAM attributed to the UAS program in Arizona and Texas compared to overall numbers reported by USBP for the same areas.

² Four patrols multiplied by 16 hours a day multiplied by 7 days a week multiplied by 52 weeks a year equals 23,296 hours.

³ *CBP's Use of Unmanned Aircraft Systems in the Nation's Border Security*, OIG-12-85, May 2012.



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Table 1. OAM-reported Apprehensions Attributed to UAS and USBP-reported Total Number of Apprehensions, FY 2013

Sector	Total Apprehensions Reported By USBP	Apprehensions OAM Attributed to UAS	Percent
Arizona – Tucson	120,939	2,161	1.8%
Texas – Rio Grande Valley	154,453	111	.07%

Source: USBP- and OAM-reported apprehension figures

According to border patrol agents and intelligence personnel in Arizona, USBP probably would have detected the people using ground-based assets, without the assistance of unmanned aircraft. These ground-based assets include Agent-Portable Surveillance Systems and Mobile Surveillance Systems, Unattended Ground Sensors, radar and camera towers, and border patrol agents.

Border Surveillance Costs

According to the UAS Mission Need Statement, OAM expected unmanned aircraft to reduce border surveillance costs by 25 to 50 percent per mile. However, because OAM does not track this metric, it cannot demonstrate that the unmanned aircraft have reduced the cost of border surveillance.

Sensor Alerts

OAM expected that unmanned aircraft would be able to respond to alerts from Unattended Ground Sensors, which USBP uses to detect movement. Sometimes, things like animals or weather, which do not require USBP action, set off the sensors. According to OAM, unmanned aircraft would fly to the location of the alert and determine whether action was necessary, thus reducing the need for border patrol agents to respond and improving USBP's efficiency. We identified only six instances in FY 2013 of unmanned aircraft responding to ground sensor alerts.

Arizona VADER Operations

In Arizona, restricted operation of the VADER sensor limited CBP's ability to analyze data to determine common entry points, times of entry, commonly used trails, and areas where people may have broken through the border fence. Initially, CBP planned to use VADER, which is mounted on unmanned aircraft, over sections of the southwest border. By doing so, CBP expected VADER to "dramatically" affect border operations in Arizona, New Mexico, and Texas.



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According to CBP, in 2011, the Department of Defense loaned VADER to CBP for surveillance to identify people and vehicles illegally crossing the southwest border. According to CBP's June 2012 VADER CONOPS, CBP would use the sensor primarily over sections of the border in Arizona, New Mexico, and Texas. VADER would increase awareness of border activity, identify gaps in CBP's surveillance capabilities, and support decision making.

In March 2013, CBP's Joint Field Command (JFC) restricted VADER operations to Arizona and prepared its own CONOPS for the sensor. The JFC limited the length of border covered by the sensor primarily to an area around a single border patrol station. The JFC restricted operations to "increase the certainty of a positive law enforcement resolution," such as apprehension, to VADER detections.

Because of JFC's diminished focus area of operation with VADER, border areas outside the focus area did not benefit from use of the sensor. In addition, CBP's Office of Intelligence and Investigative Liaison (OIIL) could not analyze the sensor data as described in CBP's June 2012 VADER CONOPS to determine entry points, trails, and fence breakthroughs along other areas of the border.

Border Coverage

According to DHS' *Annual Performance Report, Fiscal Years 2012–2014*, the UAS program "expanded unmanned aircraft system coverage to the entire Southwest Border." Although the Federal Aviation Administration permits OAM to fly over the southwest border from California to the Texas gulf coast, the unmanned aircraft focus on relatively small portions of the border.

For example, according to CBP, in FY 2013 UAS operations along the 1,993-mile southwest border focused on about 100 miles of Arizona border and operations in Texas concentrated on about 70 miles of that state's border.

UAS Program Cost

OAM has not accumulated or reported all the costs of the UAS program. For FY 2013, we estimated it cost about \$62.5 million to support 5,102 unmanned aircraft flight hours, or \$12,255 per hour.⁴ In that same fiscal year, OAM calculated a cost per flight hour of \$2,468, which included the

⁴ Our estimate includes about \$7.6 million for depreciation of 10 unmanned aircraft and equipment.



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costs of the aircraft maintenance and support contract (parts, labor, and repairs), fuel, and satellites. OAM's calculation does not include all costs, such as the costs of personnel, contract support, and equipment, which represent about 80 percent of our estimated cost to operate and support the program. According to OAM, its calculation for determining aircraft cost per flight hour is a standard practice similar to that used by the Department of Defense.

Table 2 compares the costs the Office of Inspector General (OIG) included in our estimate of UAS program cost to the costs included in OAM's calculation. We estimated the total cost per flight hour, both with and without personnel costs.

Table 2. OIG-estimated Total Cost per Flight Hour and OAM Calculation of Cost per Flight Hour for UAS Program, FY 2013

Cost Type	OIG Estimate	OAM Calculation
Contract Support, Equipment, and Overhead		
Maintenance and Support (parts, labor, repairs)	\$24,543,564	\$9,458,567
Satellite	\$2,986,077	\$1,952,000
Fuel	\$643,651	\$632,941
Depreciation	\$7,650,000	\$0
VADER	\$1,700,000	\$0
Operational Support	\$5,541,227	\$0
Engineering Services	\$188,450	\$0
Base Overhead	\$2,146,569	\$0
Total	\$45,399,538	\$12,043,508
Flight Hours	÷ 5,102	÷ 4,880*
Cost per flight hour (without personnel)	\$8,898	\$2,468
Personnel		
OAM Personnel (full-time)	\$8,215,000	\$0
OAM Personnel (part-time)**	\$2,867,500	\$0
United States Coast Guard Support	\$1,775,853	\$0
USBP Sensor Operators	\$1,395,000	\$0
OIL Personnel	\$2,726,780	\$0
Premium Pay & Overtime	\$145,413	\$0
Grand Total	\$62,525,084	\$12,043,508
Flight Hours	÷ 5,102	÷ 4,880
Full cost per flight hour (with personnel)	\$12,255	\$2,468

Source: OIG analysis of UAS program-related costs and OAM data on its cost per flight hour

* According to OAM, it used flight hours from its maintenance system rather than hours from the Tasking, Operation, and Management Information System (the system we used).

** According to OAM, it has also cross-trained some pilots to fly the unmanned aircraft when they are not flying their normally assigned aircraft.



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OAM said it does not include all the costs we included in our estimate because some are funded by other sources. For example, OAM does not include:

- the salaries of pilots because separate appropriations for air and marine operations funds them; and
- the cost of the VADER or analysis of VADER data because OIIL funds these.

The Office of Management and Budget's (OMB) Circular A-126 Revised, *Improving the Management and Use of Government Aircraft*, requires all Federal agencies with aircraft programs to accumulate all costs associated with the programs, including the cost of crew, maintenance, fuel and other fluids, leasing, landing fees, operations and administrative overhead, accident repairs, and acquisition costs. Agencies need to understand the full cost of a program to accurately determine cost effectiveness and to conduct cost comparisons when choosing aircraft.

Federal agencies must also report all their aviation activities, including costs, in the General Services Administration's (GSA) Federal Aviation Interactive Reporting System. Agencies are to report costs for crew, fuel, maintenance, and overhead. According to data provided by GSA, OAM has not reported crew or overhead costs for the UAS, or any other aircraft, since 2005.

We included costs in our estimate based on the cost elements defined by OMB. These include the costs necessary for UAS program support and operation, including pilots; support personnel, such as sensor operators; equipment; depreciation; and overhead. According to OAM, including the cost of personnel in a calculation of cost per flight hour is not standard practice. However, we believe OAM should report the full cost of the program so the Department can conduct a more accurate cost comparison to help choose the proper surveillance aircraft or decide to use nonflight-related surveillance methods.

Future UAS Program Costs

OAM's long-term plans include acquiring 14 more unmanned aircraft for its fleet, which will cause the cost of the UAS program to continue to rise. On April 4, 2012, in response to a draft of our audit report on the UAS program, OAM asserted that it did not plan to add more unmanned



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aircraft to the UAS fleet unless directed by a higher authority.⁵ Yet, in February 2012, OAM had already drafted a plan for acquiring 14 more aircraft. On April 6, 2012, 2 days after OAM's assertion to us, the contracting officer reviewed and concurred with the plan, which the DHS Chief Procurement Officer approved in October 2012. In November 2012, in a Justification for Other than Full and Open Competition, OAM proposed adding about \$443 million to the existing support and maintenance contract to acquire, support, and maintain the additional 14 aircraft. This amount does not include funding CBP may need for more personnel to operate the aircraft, which could also increase the cost.

According to OAM UAS program officials, they may have to expand the UAS program because, in a July 2008 memorandum, DHS approved the acquisition of unmanned aircraft. In its 2008 memorandum, however, DHS approved OAM's plan to acquire up to 24 unmanned aircraft; it did not require OAM to acquire all 24 aircraft.

OAM also continues to invest in new technology for the UAS program, which will further increase program costs. For example, in FY 2013, OAM acquired two VADERS for \$16.8 million. Contracted support for these new sensors will cost OAM an additional \$1.7 million for 1 year. In the long term, OAM plans to purchase more VADERS to increase its total number of sensors to six.

Conclusion

CBP's UAS program contributes to border security, but the program's effectiveness is unproven and program expectations have not been met. Specifically, CBP has not established performance measures and the unmanned aircraft are not meeting flight hour goals. Although CBP expected that the UAS program would result in increased apprehensions of illegal border crossers, reduce the cost of border surveillance, and improve the USBP's efficiency, we found little or no evidence that CBP met those expectations. In addition, VADER operations have been limited, and the unmanned aircraft do not operate along the entire southwest border as has been reported.

CBP does not calculate the total operating cost of the program. By not including all operating costs, CBP also cannot accurately assess the program's cost effectiveness or make informed decisions about program

⁵ *CBP's Use of Unmanned Aircraft Systems in the Nation's Border Security*, OIG-12-85, May 2012



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expansion. As a result, CBP has invested significant funds in a program that has not achieved the expected results, and it cannot demonstrate how much the program has improved border security. In addition, unless CBP fully discloses all operating costs, Congress and the public are unaware of all the resources committed to the UAS program.

Given that, after 8 years of operations, the UAS program cannot demonstrate its effectiveness, as well the cost of current operations, OAM should reconsider its planned expansion of the program. CBP could put the \$443 million it plans to spend to expand the program to better use by investing in alternatives, such as manned aircraft and ground surveillance assets.

Recommendations

We recommend that the Commissioner, U.S. Customs and Border Protection:

Recommendation #1:

Coordinate with the DHS Office of the Chief Readiness Support Officer (OCRSO) to conduct an independent study, before acquiring more unmanned aircraft, to determine whether:

- additional unmanned aircraft are needed and justified; and
- future funding should be used to invest in the current program or invested in other alternatives, such as manned aircraft and ground assets, to enhance surveillance needs.

Recommendation #2:

Require the JFC to lift the limitations on VADER and allow the analysis expected in the original plan for the sensor's operation.

Recommendation #3:

Require OAM to revise its UAS CONOPS to include attainable goals for the program, along with verifiable performance measures.

Recommendation #4

In coordination with the DHS OCRSO, require OAM to develop policies and procedures to ensure that it accumulates and reports all costs associated with the UAS program and other OAM flight programs.



Management Comments and OIG Analysis

CBP concurred with one of our recommendations, concurred in principle with the remaining three recommendations, and provided comments to the draft report. A summary of CBP's responses and our analysis follows. We have included a copy of the management comments in their entirety in appendix B. CBP also provided technical comments to our report. We made changes to incorporate these comments, as appropriate.

Response to Recommendation #1: CBP concurred in principle.

However, CBP said that the recommendation is based on a misunderstanding of OAM's procurement plans. According to CBP, at this time, it has no plans to acquire additional unmanned aircraft other than a replacement for the aircraft that crashed in January 2014, nor does OAM have a contract or funding in place to expand the program. OAM's existing UAS program funding is being used to expand the program's infrastructure and achieve a greater level of utilization of its existing fleet. Until OAM is able to elevate the staffing, operations, and maintenance of its existing fleet, it does not support expanding the number of unmanned aircraft. CBP requested that we close this recommendation.

OIG Analysis: CBP's comments do not address the recommendation. We believe that OAM's long-term plan is to expand its fleet of unmanned aircraft. OAM's intent to expand the program is clearly stated in its Acquisition Plan and Justification for Other Than Full and Open Competition. According to the justification, this "requirement" supports the CBP Commissioner's 2008 Acquisition Decision Memorandum and CBP's 2010 Strategic Air and Marine Plan "both of which document OAM's plans for a fleet of 24 unmanned aircraft and supporting systems."

CBP said OAM does not have funding in place to expand its fleet of unmanned aircraft; however, according to OAM's Acquisition Plan, "the plan is based on the assumption that the UAS program will receive new initiative or supplemental funding to reach end state goals. Prior funding has been provided in a similar manner."

In addition, CBP's response indicates that if OAM elevates staffing, operations, and maintenance, it would support expanding the program.

After issuing our draft report, we reached out to OCRSO to help CBP implement this recommendation. OCRSO has a key role in the DHS Joint Requirements Council and the Joint Requirements Council Aviation



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Commonality Portfolio Team, which assesses current operational needs and determines ways to fulfill those needs.

The recommendation will remain unresolved and open until CBP conducts an independent study to determine whether expanding the program is the best use of funds for border security.

Response to Recommendation #2: CBP concurred in principle. However, according to CBP, the recommendation is based on a misunderstanding that the JFC has limited VADER operations and analysis of the sensor's products. Previous limitations, based on external factors over which the JFC had no control, have already been resolved. CBP has operated VADER outside the JFC area of operations and will continue to deploy the asset to the highest priority location for DHS and CBP. CBP requested that we close this recommendation.

OIG Analysis: CBP's comments do not address the recommendation. In its response, CBP said that our assertion that the JFC decided on its own to set geographic limitations on the use of VADER is inaccurate. Yet, as shown in the portion of the JFC's VADER CONOPS in appendix C, JFC set these limitations and identified a specific section of the border as the "primary focus" of the FY 2013 VADER campaign. CBP also said there were earlier geographic limitations placed on locations for VADER operations, due to factors external to the JFC, such as airspace and other restrictions. We recognize that there were airspace limitations in a portion of Arizona and other restrictions in Texas. However, we are unaware of any restrictions in New Mexico and the stated restrictions do not explain reducing VADER operations to a single station's area of responsibility in Arizona.

CBP also said it developed its June 2012 VADER CONOPS prior to VADER operations. According to the VADER CONOPS, however, CBP fully integrated VADER on its unmanned aircraft in December 2011. OAM flew 58 VADER missions between January 1, 2012, and June 26, 2012 (the date CBP's VADER CONOPS was approved). According to CBP, the JFC and OAM essentially outperformed the requirements in the initial (June 2012) VADER CONOPS.

Table 3 shows the results of VADER operations in FY 2013 before and after the JFC limitation (set in March 2013).



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Table 3. FY 2013 VADER Missions Before and After the JFC's March 2013 Limitation

JFC Limitation, March 13, 2013	Average Length of VADER Operations (Kilometers)	Total Number of Detections	Number of flights
Before	164	12,968	83
After	71	5,456	93

Source: OIG analysis of FY 2013 daily VADER flight logs

CBP also said the JFC has shared all VADER- and UAS-related data with OIIL. The OIIL Processing Exploitation Dissemination cell at the Air and Marine Operations Center receives all video feeds, intelligence collections, and VADER feeds directly. We recognize that OIIL received the data and produced daily VADER reports, but these reports are mission summaries that show where VADER detected people. The reports from the cell do not identify common entry points, times of entry, commonly used trails, and areas where people may have broken through the border fence. These daily reports are not the strategic analysis that OIIL and CBP envisioned in the initial plans.

CBP provided information showing trend analysis of VADER data obtained between April 2012 and July 2013 in November 2014.

We believe it would be more effective in the long term to use VADER as originally planned and capture more data to analyze and detect more people. The recommendation will remain unresolved and open until CBP requires the JFC to lift its limitation on VADER operations.

Response to Recommendation #3: CBP concurred. CBP said that OAM has already begun the process of revising its UAS CONOPS, which will include performance measures. The estimated completion date is March 31, 2015.

OIG Analysis: CBP's comments appear to be responsive to this recommendation, which will remain open and resolved until OAM provides the revised UAS CONOPS that includes verifiable performance measures showing the impact unmanned aircraft have on border security. The performance measures should go beyond the capabilities of the aircraft and sensors to demonstrate return on investment and impact on border security.

Response to Recommendation #4: CBP concurred in principle. CBP agreed that establishing and following policies and procedures ensures transparency of all costs associated with all flight programs and is a required and necessary part of flight programs. According to its response,



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CBP currently reports all required costs directly associated with the operations of unmanned aircraft; however, there is no one formulaic tool that encompasses all parts of the program to derive totals for program cost. CBP said there are numerous methodologies and approaches that satisfy the requirement to report all costs associated with a program. CBP will continue to exercise its current methodology in computing program costs, including its previously developed cost per flight hour model. CBP's use of the cost per flight hour provides management with one tool to assess program performance. Alone, cost per flight hour does not capture the total program cost because it does not include all elements of the program, but it does identify internal trends. CBP said it has met the intent of the recommendation because OAM's approach meets current OMB standards. CBP requested that we close this recommendation.

OIG Analysis: CBP's comments do not address this recommendation. In its response, CBP acknowledged that establishing and following policies and procedures ensures transparency of all costs associated with all flight programs and is required and necessary for the programs. Although CBP recognized that its cost per flight hour does not capture the total program cost, it will continue to use its current methodology to compute program costs. CBP's current methodology includes about 20 percent of the full cost to own and operate unmanned aircraft.

OAM said it did not agree with the figures we used for its calculation of cost per flight hour and they should not form the basis for cost per flight hour calculations. Appendix D contains the figures OAM informed us it used in its calculation.

OAM disagreed with our estimate, specifically the cost for maintenance and support, satellite, and fuel. OAM said these figures are inaccurate because they are not the actual amounts billed to the contracts. OAM also acknowledged that Government contracts typically take months or years to fully close out depending on contract value, complexity, and number of subcontractors. We used the amounts in the contracts because contractors may continue to submit invoices for costs incurred in FY 2013.

OAM said that amounts paid on the contract were significantly less than the amounts we used. In an attempt to reconcile differences in our costs and what OAM believed to be more accurate, we requested additional information from OAM. Based on OAM's comments, we removed \$427,278 from the amount for the engineering services contract. This amount includes services for both manned and unmanned aircraft, but



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we could not separate them. According to information OAM provided, as of November 10, 2014, most of the maintenance and support, satellite, and operational support contracts have been paid. Table 4 shows the contract amounts and the updated information that OAM provided.

Table 4. Contract Amounts Compared to Updated Information from OAM

Contracts	Contract Amount	Amount Paid	Percent
Maintenance/Support	\$24,543,564	\$23,079,992	94
Satellite	2,986,077	2,338,768	78
Operational Support	5,541,227	5,076,266	92
Total	\$33,070,868	\$30,495,026	92

Source: Updated information from OAM on contract amounts

OAM disagreed with our inclusion of depreciation in our estimate. According to GSA's *U.S. Government Aircraft Cost Accounting Guide*, depreciation represents the cost or value of ownership and is the method used to spread the acquisition cost, less residual value, over an asset's useful life. Although these costs are not direct outlays as is the case with most other costs, it is important to recognize them for analysis.

OAM also disagreed with us including UAS Headquarters Program Office support, base overhead, personnel, and VADER in the total cost of the program. OAM does not recognize the cost associated with VADER even though it uses VADER detections as a measure for UAS performance. All of these costs are all directly related to the UAS program.

According to CBP, the language in OMB Circular A-126 and its governing authorities does not specifically apply to the operation of unmanned aircraft and "there is still a great deal of ambiguity in how the circular applies." Nevertheless, CBP said that OAM has been "prudent" in applying "the general intent" of the circular and is operating in a manner consistent with its "spirit." In its response CBP noted OIG's reference to the circular's requirement that "Federal agencies with aircraft programs to accumulate all costs associated with the programs, including the cost of crew, maintenance, fuel and other fluids, leasing, landing fees, operations and administrative overhead, accident repairs, and acquisition costs." According to CBP, this is an important consideration for cost planning, which OAM applies to all of its aviation assets. However, as shown in our report and CBP's response, OAM does not recognize all costs of the UAS program and intends to continue using its current methodology to compute program costs.



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In addition, Title 41 of the Code of Federal Regulations § 102-33 – *Management of Government Aircraft*, requires Federal agencies to account for the operations and ownership cost of their aircraft as described in the *Government Accounting Guide*, which follows OMB Circular A-126. With some exceptions, such as the armed forces and intelligence agencies, the requirements “apply to all federally funded aviation activities of executive agencies of the U.S. Government.” GSA is revising this section of the Code of Federal Regulations to include unmanned aircraft and estimates the revision will be published in the Federal Register by December 31, 2014.

Subsequent to our draft report, we included DHS’ OCRSO to assist CBP in implementing this recommendation. OCRSO has a lead role on the Aviation Governance Board, which is DHS’ governing authority over aviation-related mission support activities, including policy.

The recommendation will remain open and unresolved until OAM recognizes and reports all costs associated with the UAS program and other OAM flight programs.

Expected Results

In its response, CBP said we cited a limited sample of expected results from historical documents, some going back to 2007. Because OAM does not have performance measures for the unmanned aircraft, we used all the expected results from OAM’s documents. The expected results we identified appear reasonable. For example, we expected to see an increase in apprehensions or an increase in USBP efficiency by having the unmanned aircraft respond to ground sensor alerts. In addition, we expected to see aircraft capable of being airborne for up to 20 hours to be in the air more than they are. Instead, we found little or no evidence that OAM achieved its expected results.

Apprehensions

CBP said that apprehensions are not an appropriate measure of unmanned aircraft performance. According to CBP, the role of the unmanned aircraft, specifically VADER, is to report detections. The unmanned aircraft detect targets of interest and provide this information to personnel on the ground who apprehend the suspects. Aircraft are only credited with contributing to the apprehension if they remain on the scene until the apprehension is verified. CBP said a better measure of performance is detections.



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According to JFC's VADER CONOPS, VADER's primary role is to provide detection, classification, and tactical cueing in a geographically focused area, resulting in an increased certainty of interdiction. According to OAM, in FY 2013 VADER operations detected, identified, and classified 18,239 suspected undocumented aliens and smugglers. However, OAM could only attribute 2,172 apprehensions to unmanned aircraft. In addition, OAM's FY 2013 detection statistic is for VADER in Arizona, which only comprised about 28 percent of the total flight hours for the program in that fiscal year.

CBP also said we did not recognize other UAS program achievements. Specifically, our draft report did not include seizure statistics along the southwest border and during transit zone operations. We did not include these statistics in the draft report because OAM's documents did not identify expected results for seizures. However, Table 5 shows the amount of marijuana seized along the southwest border that OAM attributed to the UAS program compared to the overall numbers reported by USBP for the same areas. CBP also said that unmanned aircraft operations in Central America and Hispaniola interdicted 7,439 pounds of cocaine and 2,000 pounds of marijuana.

Table 5. OAM-reported Marijuana Seizures Attributed to the UAS Program and USBP-reported Total Seizure Amounts, FY 2013

Sector	Total Pounds of Seized Marijuana Reported By USBP	Pounds of Seized Marijuana OAM Attributed to the UAS program	Percent
Arizona – Tucson	1,193,083	16,345	1.37%
Texas – Rio Grande Valley	797,249	33,103	4.15%

Source: USBP- and OAM-reported marijuana seizure figures

Border Surveillance Costs

In its response to our draft report, CBP said it did not adopt reduction of border surveillance costs as a performance measure.

Sensor Alerts

CBP said that, initially, responding to sensor alerts with unmanned aircraft was appropriate for its technological capabilities. CBP used unmanned aircraft for this function before implementing VADER and continues to perform this function on a limited basis. According to CBP, however, technological advances to the system have made this a less



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efficient use of the unmanned aircraft's current capabilities, negating its significance as a performance measure. At the time of our audit, CBP operated one VADER in Arizona, which only comprised about 28 percent of the total flight hours for the program in FY 2013.

Border Coverage

According to CBP, our statements that unmanned aircraft are not operating along the entire southwest border are inaccurate. CBP said OAM has authorization to fly, and has flown, the unmanned aircraft along every stretch of the southwest border, from California to the Texas gulf coast.

OAM provided additional flight hour information that showed 44.6 hours flown over California and 3.8 hours flown over New Mexico. The California hours involved an unmanned aircraft flying over that state to conduct missions over water off the state's southern coast. We do not know what the 3.8 hours over New Mexico flight hours involved. OAM did not provide information that showed surveillance missions in either of these states.

We believe it is misleading for CBP to report that its unmanned aircraft operate over every stretch of the southwest border when these flights appear to be simply on the way to another mission.



Appendix A

Objectives, Scope, and Methodology

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.

The objective of our audit was to determine the effectiveness and cost of CBP's UAS program. To answer our objective, we:

- Interviewed officials at OAM in Washington, DC, to gain an understanding of the UAS program and obtain program statistics and cost information;
- Obtained and reviewed relevant criteria, policies, and other guidance related to the UAS program, such as the UAS CONOPS, Mission Need Statement, and the UAS Acquisition Plan, which we used to identify the expected results of the program;
- Obtained and reviewed DHS's *Annual Performance Report, Fiscal Years 2012 – 2014*;
- Obtained and analyzed unmanned aircraft flight data to learn when, where, how often, and for how long the unmanned aircraft were flown, as well as the types of missions performed;
- Conducted site visits to airbases in Sierra Vista, Arizona; Corpus Christi, Texas; Grand Forks, North Dakota; and CBP's Air and Marine Operations Center in Riverside, California, to better understand those operations;
- Analyzed apprehension data for the two border patrol stations in Arizona where CBP concentrated its southwest border UAS program surveillance operations;
- Interviewed border patrol agents at border stations in Arizona and Texas, as well as border patrol agents and OAM personnel at the JFC in Arizona, to determine the impact of the UAS program on their operations;
- Interviewed OIIL personnel in Washington, DC; at the Air and Marine Operations Center in Riverside, CA; at the UAS airbases we visited; and at the JFC in Arizona, to better understand their operations;
- Performed data reliability testing on flight hour and detection information and determined that it was sufficiently reliable for the purposes of our audit;
- Obtained data CBP reported for overall apprehension figures. We interviewed officials at CBP to determine how CBP collects apprehension data and obtained an independent verification and validation report of



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reported statistics. We determined that the overall apprehension figures were sufficiently reliable for the purposes of our audit; and

- Could not verify the apprehension figures that OAM attributed to the UAS program. Given this limitation with OAM's UAS-assisted apprehensions, which prevented an adequate assessment, we determined that OAM's reported apprehension figures are of undetermined reliability.

We used OMB's guidance, as a basis, to identify aircraft program costs and estimated how much it cost CBP to own and operate its unmanned aircraft in FY 2013. Specifically, we:

- Used the contract amounts for maintenance and support, operational support, VADER, satellite, and engineering services;
- Estimated personnel costs for OAM and USBP personnel based on CBP's personnel rate of \$155,000 per employee; and
- Obtained cost estimates from the United States Coast Guard and OIIL for UAS costs they incurred in FY 2013 and on the cost of base overhead and pilot overtime from OAM in FY 2013. These estimated costs were not significant compared to the total estimated cost, and we did not test the reliability of the estimates provided.

Our cost estimate includes about \$7.6 million for depreciation of the 10 unmanned aircraft and equipment. We calculated straight-line depreciation, using the average cost of an unmanned aircraft system, less 10 percent residual value, over the useful life. The average cost of the unmanned aircraft and equipment was \$17 million; therefore, the residual value is \$1.7 million. The useful life of the Predator B is 20 years.

$\$17,000,000 - \$1,700,000 = \$15,300,000 \div 20 \text{ years} = \$765,000$ multiplied by 10 aircraft.

We conducted this performance audit between May 2013 and September 2014 pursuant to the *Inspector General Act of 1978*, as amended, and according to generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based upon our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based upon our audit objectives.



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Appendix B

Management Comments to the Draft Report

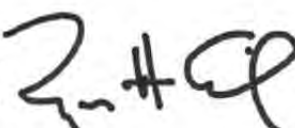
1300 Pennsylvania Avenue NW
Washington, DC 20229

OCT 24 2014



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

MEMORANDUM FOR: The Honorable John Roth
Inspector General

FROM: Eugene H. Schied
Assistant Commissioner
Office of Administration 

SUBJECT: OIG Draft Report: "U.S. Customs and Border Protection's
Unmanned Aircraft System Program Does Not Achieve Intended
Results or Recognize All Costs of Operations" (Project Number
13-135-AUD-DHS)

U.S. Customs and Border Protection (CBP) thanks the Department of Homeland Security (DHS) Office of the Inspector General (OIG) for the opportunity to review and comment on this draft Report.

CBP disagrees with the draft OIG Report's portrayal of the program's effectiveness; the Report's analysis of cost and cost per flight hour (CPFH)—which is based on OIG's misapplication of Office of Management and Budget (OMB) Circular A-126, "Improving the Management and Use of Government Aircraft" (OMB A-126); and the Report's misinterpretation that Office of Air and Marine (OAM) plans to expand the Unmanned Aircraft System (UAS) fleet to 24 aircraft. While the title and content of the Report state the CBP UAS program has not achieved the intended results, CBP has achieved or exceeded all relevant performance expectations.

CBP also disagrees with the methodology used to calculate CPFH to reach the Report's conclusions, and with the Report's interpretation of OMB A-126—as it includes fixed costs for aircraft owned and operated by the government, when the circular specifically states variable costs should be used. In addition, the OIG Report inaccurately states that OAM plans to procure 14 more unmanned aircraft, when in fact, CBP's plan is to enhance the UAS program's infrastructure and achieve a greater utilization of its existing fleet.

To offer a more accurate and comprehensive picture of the CBP UAS program's effectiveness, costs, and acquisition plans, CBP takes this opportunity to provide additional context and details that pertain to the draft OIG Report's findings and conclusions that appear to have been overlooked by OIG in assessing the information provided by CBP during this audit.

Unmanned Aircraft Systems (UAS) Program Effectiveness

CBP believes the OIG Report should include quantitative and qualitative information which better represents the current performance of the CBP UAS program. This information was



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provided to OIG during the review. There have been countless successful CBP missions over the years in which UAS capabilities and resulting products have contributed significantly to the successful investigation, dismantling, and disrupting of criminal enterprises and organizations. The CBP UAS has also collected on numerous intelligence targets, and supported other Federal, State, and local agencies in various capacities, all of which are successful utilizations of the UAS.

Contrary to the implications in the Report, CBP's OAM has achieved the majority of the performance expectations identified in the 2010 Concept of Operations (CONOPS). These milestones, some which have been achieved ahead of the forecasted timeframe, include objectives for supporting a full range of mission sets; operating over land borders, over littoral waters, and in international waters; providing data to intra and interagency information networks; working with the Federal Aviation Administration to expand access to the National Airspace System; performance capabilities, including operation of interchangeable sensor payloads, and performance of long endurance missions; serving as a test platform for other agency technology projects; and modernizing the OAM UAS through block upgrades. In addition, CBP is currently in the process of updating the UAS CONOPS, which will include performance measures that represent the system's effectiveness.

Other CBP UAS program achievements that the draft OIG Report does not recognize include seizure statistics along the Southwest Border and during Transit Zone operations. During Fiscal Year (FY) 2013, CBP's UAS program directly contributed to the seizure of 49,447 pounds (with a value of \$122 million) of marijuana on the Southwest Border, averaging approximately 15.7 pounds of marijuana seized at the Southwest Border per flight hour. Pertaining to Transit Zone operations, the UAS Guardian has deployed to Central America and Hispaniola four times since FY 2012, interdicting a total of 7,439.2 pounds of cocaine (with a value of \$562 million), at an average of over 14 pounds interdicted per flight hour. These deployments also interdicted 2,000 pounds of marijuana. In the most recent deployment, OAM operated from a public international airport, flying published terminal arrival and departure procedures mixed with commercial airline traffic, an accomplishment previously considered not possible.

The OIG draft Report does not cite these achievements. Instead, the Report cites a limited sample of expected results from historical documents, some going back to 2007. The expectations the OIG focused on were based on the program receiving resources that were not obtained, performance measures that were never employed by CBP, or technological capabilities that have been surpassed. This context is critical for presenting an accurate assessment of the CBP UAS program's current performance and achievements.

The flight hour metric cited in the OIG Report was included in the *Concept of Operations for CBP's Predator B Unmanned Aircraft System: Fiscal Year 2010 Report to Congress*, dated June 29, 2010. This operations "tempo" objective was based on receiving commensurate investments in UAS resources, such as personnel, aircraft, spares, and other necessary infrastructure. Because of funding decreases across the Department, CBP has been unable to meet the objectives. CBP is achieving the maximum number of flight hours possible given its current funding levels.



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In addition to concerns about incomplete use of information provided, CBP is concerned about OIG's selection of measures and metrics. Specifically, the apprehension metric reported on by OIG is not an appropriate measure of an aircraft's performance. The role of the UAS, specifically in the case of the Vehicle and Dismount Exploitation Radar (VADER), is to report detections. It is nearly 100 percent effective in the execution of that capability, and this information is then used to aid in CBP's ground response. Aircraft detections are provided to law enforcement on the ground who apprehend suspects. OAM has no way to attach a disposition to a detection that is not immediately resolved with any degree of certainty. Aircraft are only credited with contributing to the apprehension if the aircraft stays on scene until the apprehension is verified, which is not always an effective use of the asset. For these reasons, a better measure of UAS performance is detections. CBP provided OIG with FY 2013 data on detections. While the number of apprehensions attributed to UAS was only around 2,172, during the same timeframe, the VADER pod detected, identified, and classified 18,239 suspected undocumented aliens and smugglers. The detections illustrate that VADER is providing situational awareness, a critical capability for border security.

Further, the draft OIG Report cites speculation that the Border Patrol could have detected the suspects using other means. CBP deploys multiple layers of personnel, technology, and infrastructure, and all CBP assets are instrumental in achieving the Agency's mission. In the view of the local Border Patrol field leadership, the asset is a critical contributor to border security.

In reporting on the objective to reduce the cost of border surveillance, the draft OIG Report refers to a statement in the March 20, 2007, Mission Need Statement (MNS). At the time the MNS was written, CBP was considering a range of performance measures, potentially including the cost of border surveillance. CBP did not adopt this as a performance measure, so the necessary data is not available. Including this as a measure that has not been met would not be accurate.

The draft OIG Report also identifies responding to motion sensor alerts as an unmet expectation. Initially, this use of the unmanned aircraft was appropriate for its technological capabilities. CBP did utilize the UAS for this function prior to the implementation of VADER, and continues to perform this function on a limited basis; however, technological advances to the system have made this a less efficient use of the current capabilities of the UAS, and so its significance as a performance measure has been negated.

It is also important to clarify where CBP operates the UAS along the Southwest Border. The DHS FY 2012-2014 Annual Performance Report includes a text box on Southwest Border Security on page 21, which states "expanded unmanned aircraft system coverage to the entire Southwest Border." This milestone refers to the expansion of UAS access to the National Airspace System across the entire Southwest. While CBP UAS flights are focused on the highest priority sections of the border, OAM has authorization to fly, and has flown, the UAS along every stretch of the Southwest Border, from California to the Texas gulf coast. Therefore, statements in the draft OIG Report that, "unmanned aircraft are not operating along the entire southwest border," are inaccurate.



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VADER

The originally anticipated VADER operations, which were documented in the *Concept of Operations for Vehicle and Dismount Exploitation Radar (VADER) Deployment*, issued in 2012, were developed prior to the operations of the asset. As is appropriate, the tactics and techniques for utilizing the system were refined as CBP gained experience using the system, culminating in a new concept of operations written by CBP's Joint Field Command (JFC). The new concept of operations recognized that VADER provided not only strategic information, but tactical information as well. Based on this improved understanding, as well as the fact that the JFC area of responsibility was the highest priority location for DHS and CBP, the JFC Commander utilized the assets under his purview, including VADER, to accomplish CBP's mission. As such, and contrary to the OIG Report, the JFC and OAM essentially outperformed the requirements in the initial CONOPS for the VADER.

The statement that the JFC decided on its own accord to set geographic limitations on the use of VADER is inaccurate. There were earlier geographic limitations placed on the locations of operations of VADER, due to factors external to the JFC, such as airspace and other restrictions. Additionally, these earlier geographic limitations have since been lifted.

Contrary to the assertions in the draft Report that CBP has been prevented from analyzing VADER's sensor data, the JFC has shared all VADER and UAS related data with CBP's Office of Intelligence and Investigative Liaison (OIIL). The OIIL Processing Exploitation Dissemination (PED) cell at the Air and Marine Operations Center (AMOC) in Riverside, California, receives all video feeds, intelligence collections, and VADER feeds directly, as well as copies of all follow-up JFC field reports associated with VADER detections. OIIL reports that from August 29, 2012 through September 1, 2014, the PED cell produced 292 daily VADER products. In addition to the OIIL PED cell, the JFC established a Joint Intelligence Operations Center (JIOC). The significance of both the PED cell and JIOC is that VADER data is streamed simultaneously to both; to the PED cell for strategic analysis, and to the JIOC for actionable intelligence.

UAS Program Cost

CBP disagrees with the cost and CPFH calculations in the OIG Report. Aircraft CPFH figures are not meant to be an indicator of a program's actual cost, but a management tool to assess program performance. OAM complies with OMB A-126, and derives a reasonable CPFH using both fixed and variable costs. As reported by the Congressional Budget Office (CBO), the Defense services use similar cost methodologies to derive their respective CPFH figures, but tailor their CPFH programs to identify internal trends to support their budgetary and management processes. The OIG draft Report erroneously states that OAM is not properly reporting UAS program costs in the GSA Federal Aviation Interactive Reporting System (FAIRS), as OAM recorded FY 2013 costs in FAIRS in accordance with GSA requirements.



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UAS Program Cost and OIG Estimates

The Report cost figures do not accurately reflect OAM UAS Program cost, include figures not properly attributed to the UAS Program, and inflate the actual program cost. OAM does not agree with the figures in Table 2 identified as "OAM Calculation," and these numbers should not form the basis for CPFH calculations. OAM specifically disagrees with the Maintenance and Support cost figure; Satellite cost figure; Fuel cost figure; Depreciation cost figure, as well as its inclusion as a program cost; inclusion of VADER systems; inclusion of OAM UAS Headquarters Program Office support; Engineering Services cost figure; and inclusion of Base Overhead and Government Personnel costs. These figures are inaccurate, and in some cases, should not be included in the Program Cost, or associated with a CPFH model.

Cost Per Flight Hour Discussion and Formulation

CBP disagrees with the methodology used by OIG to derive UAS CPFH. In accordance with OMB A-126, OAM developed a CPFH model to "improve the management and use of" OAM aviation resources. OMB A-126 Attachment A, Accounting for Aircraft, states:

The actual cost of using a government aircraft is either: (a) the amount that the agency will be charged by the organization that provides the aircraft, (b), if the agency operates its own aircraft, the variable cost of using the aircraft; or (c), if the agency is not charged for the use of an aircraft owned by another agency, the variable cost of using the aircraft as reported to it by the owning agency.

Agencies should develop a variable cost rate for each aircraft or aircraft type (i.e., make and model) in their inventories before the beginning of each fiscal year.

Based on the guidance above, and because OAM operates its own aircraft, OAM uses variable costs to calculate its CPFH. Variable and fixed costs are defined in Attachment B, Standard Aircraft Program Cost Element Definitions, which divides crew costs into variable costs and fixed costs. As defined, variable costs for crew are limited to travel, such as per diem; overtime charges; and wages of crew hired on an hourly or part-time basis. The crew costs that do not vary according to aircraft usage, including OAM's salaried personnel, are fixed costs. Therefore, OAM includes its variable costs as appropriate, but does not include the salaries, benefits, or training costs for its personnel. OIG's inclusion of fixed costs appear to conflict with the OMB A-126 guidance.

OAM recognizes there are differing approaches to calculating CPFH, although the OAM approach does not significantly differ from alternative cost model approaches. Under the Conklin and de Decker commercial method, the four main data sets for each aircraft type are: (1) the cost of depot level repair parts, (2) the cost of maintenance consumables, (3) the cost of fuel, and (4) the cost of maintenance contracts, expressed in terms of a CPFH, then added all together for a total CPFH. The CBO even notes differences in the Defense services CPFH models in its publication "Models Used by the Military Services to Develop Budgets for Activities Associated with Operational Readiness" (February 2012), highlighting "[b]udget models for flying hours calculate the quantities of fuel, spare parts, and other resources required per hour of flight, and



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then apply historical cost factors to each of those resources to estimate the total cost per flying hour."

The specific components of the OAM approach to calculating CPFH include both direct costs (fuel, avionics, engine, airframe, equipment, support, and services) and indirect costs (aircraft specific travel, training, tools, equipment, parts, and communications support). By determining CPFH in this manner, OAM is "identifying opportunities to reduce aircraft operational cost" as highlighted in Attachment A of OMB A-126.

OMB A-126 Does Not Cover Unmanned Aircraft in its Present Form

The language in OMB A-126 and its governing authorities, specifically 31 U.S.C. 1344, titled, Passenger Carrier Use, addresses transporting government personnel on government aircraft versus commercial carriers and does not specifically apply to the operation of unmanned aircraft. However, OAM has been prudent in its approach to applying the general intent of the circular. OIG notes "OMB's Circular No. A-126 Revised, *Improving the Management and Use of Government Aircraft*, requires Federal agencies with aircraft programs to accumulate all costs associated with the programs, including the cost of crew, maintenance, fuel and other fluids, leasing, landing fees, operations and administrative overhead, accident repairs, and acquisition costs. Agencies need to understand the full cost of a program to accurately determine cost effectiveness and to conduct cost comparisons when choosing aircraft." This is an important consideration for cost planning, which OAM applies to all of its aviation assets. As it relates to the operation of unmanned aircraft, there is still a great deal of ambiguity in how the circular applies; however, OAM is operating in a manner consistent with the spirit of the circular. The next revision of the circular, currently in progress, could provide more guidance specific to unmanned aircraft, which CBP anticipates might help resolve the current ambiguity.

Future UAS Program Costs

The draft Report inaccurately conveys OAM's UAS procurement plans. The draft Report states, "CBP's long-term plans include adding 14 more unmanned aircraft to its fleet [of 10 aircraft]... In October 2012, OAM proposed adding about \$443 million to the existing support and maintenance contract for its unmanned aircraft to acquire, support, and maintain the additional 14 aircraft."

OIG referenced a July 17, 2008, Acquisition Decision Memorandum from the DHS Under Secretary for Management and a 2012 Acquisition Plan Annex for the CBP Strategic Air and Marine Plan to support its conclusion that OAM plans to procure an additional 14 UAS. While these documents outline potential UAS procurements, they authorize – not mandate – the purchase. These documents clearly state two key caveats: 1) procurement is based upon OAM's mission needs and determination, and 2) procurement is dependent on available funds. Contrary to statements in the draft Report, OAM has always been in agreement that the 2008 Acquisition Decision Memorandum did not mandate expansion, but authorized OAM to expand the program, contingent upon funding.



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OIG Draft Report: "U.S. Customs and Border Protection's Unmanned Aircraft System Program Does Not Achieve Intended Results or Recognize All Costs of Operations"

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Currently, OAM has a fleet of nine UAS, and intends to purchase one additional aircraft to replace the one that was ditched off the coast of California in January 2014. There is no intent at this time to acquire additional UAS beyond the one replacement aircraft, nor does OAM have a contract or funding in place to expand the UAS program. This is directly supported in CBP's response to OIG's 2012 Report (OIG-12-85), wherein CBP responded it did not plan to "expand the UAS fleet beyond the 10 systems already in operation or on order unless directed to do so by higher authority." OAM's existing UAS program funding allocation is being used to expand the program's infrastructure and achieve a greater level of utilization of its existing fleet. Until OAM is able to elevate the staffing, operations, and maintenance of its existing UAS fleet, it does not support the expansion of the program.

CBP has previously discussed this issue with OIG, providing information and background on these and subsequent developments. These actions illustrate responsible program management to develop contingency plans that would enable the program to execute congressional and administration direction.

The draft report contained four recommendations. CBP's response to the recommendations is below:

Recommendation 1: Conduct an independent study of the UAS program, before acquiring more unmanned aircraft, to determine whether:

- Additional unmanned aircraft are needed and justified; and
- Future funding should be used to invest in the current program or invested in other alternatives, such as manned aircraft and ground assets, to enhance surveillance needs.

Response: Concur in principle. However, CBP would like to clarify that the recommendation is based on a misunderstanding of OAM's procurement plans. At this time, CBP has no plans to acquire additional UAS beyond the one replacement aircraft, nor does OAM have a contract or funding in place to expand the UAS program. OAM's existing UAS program funding is being used to expand the program's infrastructure and achieve a greater level of utilization of its existing fleet. Until OAM is able to elevate the staffing, operations, and maintenance of its existing UAS fleet, it does not support the expansion of its number of aircraft. CBP respectfully requests closure of this recommendation.

Recommendation 2: Require the JFC to lift the limitations on VADER and allow the analysis expected in the original plan for the sensor's operation.

Response: Concur in principle. However, CBP would like to clarify that the recommendation is based on a misunderstanding that the JFC has limited VADER operations and the analysis of the sensor's products. Previous limitations, which were based on external factors over which the JFC had no control, have already been resolved. CBP has operated VADER outside the JFC area of operations, and will continue to deploy the asset to the highest priority location for DHS and CBP. CBP respectfully requests closure of this recommendation.

Recommendation 3: Require OAM to revise its UAS Concept of Operations to include attainable goals for the program, along with verifiable performance measures.



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Department of Homeland Security

OIG Draft Report: "U.S. Customs and Border Protection's Unmanned Aircraft System Program Does Not Achieve Intended Results or Recognize All Costs of Operations"

Page 8

Response: Concur. CBP's OAM has already begun the process to revise its UAS Concept of Operations, which will include performance measures. Estimated Completion Date: March 31, 2015.

Recommendation 4: Require OAM to develop policies and procedures to ensure that it accumulates and reports all costs associated with the UAS program and other OAM flight programs, as required by OMB.

Response: Concur in principle. CBP agrees that the establishment and following of policies and procedures ensuring transparency of all costs associated with all flight programs is required and is a necessary part of such flights programs. CBP currently reports all required costs directly associated with the operations of unmanned aircraft; however, there is no one formulaic tool that can encompass all programs' parts to derive program cost totals. While CBP concurs in principle with the OIG recommendation, there are numerous methodologies and approaches that satisfy the requirement to report all costs associated with a program. CBP will continue to exercise its current methodology in computing program costs, including its previously developed CPFH model. CBP's use of the CPFH provides management with one tool to assess program performance, and while it alone does not capture the total program costs as it does not include all elements of the program, it does enable CBO to identify internal trends. While CBP's approach to accumulating and reporting all costs associated with the UAS program and other OAM flight programs differs from the approaches utilized by OIG, we believe the intent of the recommendation is met in that OAM's approach meets current OMB standards. CBP respectfully requests closure of this recommendation.

Again, thank you for the opportunity to review and comment on this draft Report. Technical comments were provided under separate cover. If you have any questions or would like additional information, please contact me at (202) 344-2300, or a member of your staff may contact Ms. Jennifer Topps, Component Audit Liaison, Management Inspection Division, at (202) 325-7713.



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Appendix C

Excerpt from JFC VADER Concept of Operations

U.S. Department of Homeland Security
Bureau of Customs and Border Protection
Concept of Operations Report for:

VaDER FY 13

Con Op Number: [REDACTED]
Report Date: 03/13/2013

SITUATION

The overarching goal and intent of the Joint Field Commander is to increase the certainty of a positive law enforcement resolution to VaDER detections in a priority focus area. The success of VaDER is dependent on the [REDACTED] that work together to insure a law enforcement resolution of VaDER detections.

As a result of the ongoing testing of the VaDER sensor package, the JFC Commander and component field leadership have determined that adjustments to current TTPs are warranted by refining VaDER tracks and adjusting the operational ground force laydown and intelligence capabilities to a manageable area of operations, primarily focused within a single station AOR.

The Joint Field Command has identified [REDACTED] as the priority focus for the fiscal year 2013 campaign. The TCO's freedom of movement is augmented by the [REDACTED] border zones. In order to maximize efficiency and effectiveness of the forces and technology deployed to these areas, the Joint Field Command will deploy the CBP-UAS/VaDER in a dual role as follows:

1. Tactical Support – Primary Role

The primary role is to provide detection, classification and tactical cueing in a geographically focused area. This will enable designated air and ground forces to directly support the JFC Air Integration Strategy, resulting in an increased certainty of interdiction.

2. Strategic Support – Situational Awareness

The secondary role will be to serve as a strategic wide area surveillance and intelligence gathering platform. This role utilizes the CBP-UAS/VaDER while flying large portions of the Arizona-Sonora border to provide situational awareness by detecting locations and numbers of persons crossing the border. Due to the wide area of this search it will be impractical for the CBP-UAS VaDER to provide direct tactical support to agents on the ground and still provide a complete situational awareness picture.



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Appendix D

Data Used in OAM's Cost Per Flight Hour Calculation

From:

To:

Cc:

Subject:

RE: OIG Unmanned Aircraft Audit Budget request

Date:

Friday, February 28, 2014 7:36:13 AM

Attachments:

I've got some of the information and materials that were requested, and I'm providing what I have to this point.

For number 2, the breakout of the five categories is:

FY13 W/DEPOT COST- 10/01/2012 - 09/30/2013

Category	Values	Per Hour
Hours	4880	
Parts	7220316.68	1479.57
Labor	790686	162.03
Outside Repairs	1447564.98	296.63
Fuel	632941	129.70 @3.85
Satellite	1952000	400.00

CPFH 2467.93



Appendix E

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Appendix F

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