October 01 2011

Fast Forward

It’s time to speed up the retirement of the legendary U-2, argues Robert Haffa, a consultant to Global Hawk prime contractor Northrop Grumman.

The Pentagon has asked the military services, including the Air Force, to dig deep into their pockets to contribute savings to the nation's forthcoming deficit reduction plans. One way the Air Force could contribute would be to accelerate the transition from its fleet of piloted U-2 Dragon Lady high-altitude surveillance planes to the unmanned Global Hawks. Each hour that the Air Force flies an unmanned Global Hawk in place of the U-2 saves the country about $16,000 — and last year the U-2 flew roughly 15,000 hours. Simply put, to reap considerable savings without jeopardizing the important high-altitude, long-endurance (HALE) reconnaissance mission, the Air Force should retire the U-2 as quickly as possible.

As it stands, the Air Force High Altitude Transition plan calls for ceasing U-2 flights at the end of fiscal year 2015. But that plan was developed before we learned the magnitude of the savings that would be sought from the defense budget over the next five years. With the deficit now a national security issue, the Air Force no longer has the luxury of making a leisurely transition between the old and the new.

A good alternative to the existing plan would be to retire the majority of the U-2s by the end of fiscal 2013. A select few U-2s could be maintained during the transition to ensure full-spectrum coverage and to hedge against unanticipated challenges in deploying additional Global Hawks with electro-optical/infrared (EO/IR) still cameras. It is true that the Global Hawk, like other sophisticated aircraft, proved more expensive to develop than first envisioned. But a restructured Global Hawk program has weathered cost-containment breaches under the U.S. Nunn-McCurdy acquisition law, and a faster U-2 drawdown will accelerate the savings promised by a mature Global Hawk production line.

Cost Questions

The good news for the Air Force is that few question the value of the high-altitude, long-endurance intelligence, surveillance and reconnaissance mission, whether in support of a conventional or irregular military contingency. What is being questioned is how to perform this mission in the most cost-effective manner.

It is not hard to understand why the Air Force is having difficulty saying goodbye to the U-2. For more than 50 years, the U-2 has proved to be a versatile and capable HALE platform. Operating at altitudes as high as 70,000 feet, the U-2's sensors can detect targets at ranges well beyond those covered by most other ISR aircraft, and monitor large swaths of mountainous topography, as objects of interest are less likely to be masked by terrain.

Today, the 33 U-2s stationed at Beale Air Force Base, Calif., are able to support an operational fleet of 27 aircraft that deploy regularly to support combatant commanders in the Pacific, European, Central and African areas of responsibility. Since 2007, the U-2 has flown about 15,000 hours each year, with more than half of that time on station overseas.

During these deployments, the U-2 is tasked to gather various forms of airborne intelligence, or INTs. In a typical 12-hour sortie over Afghanistan, for example, U-2s provide continuous signals intelligence (SIGINT) collection, while taking more than 100 electro-optical, infrared or radar images. Each U-2, however, has a unique configuration owing to a limited number of sensor packages and constraints on the size and weight of those packages. As a result, the fleet's sensor inventory is limited to:

- Six Senior Year Electro-optical Reconnaissance Systems (SYERS).
- Eight Advanced Synthetic Aperture Radar Systems (ASARS).

- Seven SIGINT payloads (RAS-1).
- Three Advanced Signals Intelligence Program SIGINT payloads.
- Six Optical Bar Cameras carrying “wet film.”

Sensors are packaged on each plane based on mission requirements, but the U-2 cannot simultaneously carry the SYERS sensor and the ASARS radar. If the weather over the target area turns cloudy, a U-2 airborne with a SYERS payload is limited to SIGINT collection. Global Hawks do not have this limitation.

The Global Hawk is not quite the new kid on the block it is often made out to be. Although initial operational capability was declared for the fleet in August, the Global Hawk has been a steady contributor to the HALE mission for a number of years. Advanced technology demonstrator variants of the aircraft were deployed to conduct ISR missions over Afghanistan in 2002 and above Iraq in 2003; by 2010, Global Hawks had accumulated more than 30,000 combat hours and 1,500 combat sorties. The initial aircraft, known as the Block 10, was outfitted with an integrated sensor suite that provided EO/IR still images, plus a radar for all-weather imagery and ground moving target indications. That basic aircraft has been upgraded to a Block 30 configuration with an enhanced sensor suite.

The addition of a 20 kilowatt generator onto the Block 30 planes and an advanced airborne signals intelligence payload have given the aircraft even more multi-INT capability. One Global Hawk can now provide six distinct types of intelligence: EO, IR, radar, coherent change detection, ground moving target indicators and SIGINT. In contrast, a U-2 with SYERS provides four INTS— EO, IR, coherent change detection and SIGINT, and a U-2 with ASARS provides three INTS — radar, MTI and SIGINT.

Money Saved

Sensors are critical aboard a HALE airplane, but so are the platform’s range and endurance. As a remotely piloted aircraft, the Global Hawk offers distance and persistence that the U-2 simply can’t provide owing to the physiological limits of its human operator. Important characteristics to compare include the maximum sortie length that each platform can endure, which equates to the range, and therefore to the target set that can be covered. Endurance also equates to time on station, proportional to the range at which the orbit is established. Time on station became a critical variable in the early years of Operation Iraqi Freedom because the Global Hawk was tasked to patrol the eastern and western borders of the country. Endurance is also valuable during humanitarian relief operations. After the Japanese earthquake and tsunami, a single Global Hawk orbited high above affected areas for more than 20 hours to help direct rescue and recovery actions.

In terms of range, a Block 30 operating out of a Mediterranean base can reach the southern tip of Africa and remain on station for six hours before returning. Alternatively, a Global Hawk could launch from California, be over Korea within 18 hours, and remain on station for eight hours before landing in Guam. This operational reach gives commanders a ready response when a crisis erupts. When an earthquake struck Haiti in January 2010, a Global Hawk was overhead 37 hours after the first shock. The U-2 required two weeks to deploy.

Persistence translates into money saved. To support operations in Afghanistan, a single Global Hawk could provide 22 to 24 hours of support, while it would require four U-2s flying a total of 48 hours to provide comparable presence. This operational efficiency will reduce costs. The U-2 costs $31,000 per flight hour, according to Air Force’s 2010 Total Operating Cost estimates.

These estimates are conservative because they do not include the costs of the T-38 companion flight training for U-2 pilots, or the physiological support of those pilots, or the life-cycle costs attendant to the aircrew required to be recruited, trained, retained and retired. In contrast, the estimates for Global Hawk Block 30 when it reaches full flying hour rates are $15,000 per hour.

The foundation for the existing transition plan is a 2001 requirement to field six total HALE ISR orbits to support two theaterwide, major combat operations. The planning assumption is that four Global Hawks would be required to form one orbit. The plan calls for building from three U-2 orbits to six combined U-2/Block 30 orbits. The U-2s would be drawn down as each additional Global Hawk orbit is deployed.

Building to six orbits while sustaining the U-2 through 2015 would be expensive: Phasing out the U-2 over five years totals $1.65 billion in operations and maintenance alone. Yet, by the end of fiscal 2013, the three Global Hawk orbits will provide 11 more hours per day on station at roughly half the cost. A more rapid drawdown of U-2 operations makes fiscal and operational sense because money can be saved with only a slight decline in HALE surveillance.

In today's budget environment, the Air Force must weigh the relative importance of each mission area against the affordability of the systems underwriting that mission. When an equal capability is available at reduced cost, the Air Force should quickly divest itself of more expensive platforms. Future plans call for the Global Hawk to replace the U-2. Accelerating that future makes sound economic and strategic sense.

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