The LEMV will be a recoverable and reusable multi-mission platform. It can be forward located to support extended geostationary operations from austere locations and is capable of beyond-line-of-site command and control. (Graphic courtesy of Northrop Grumman Corp.)

Acquisition of Long Endurance Multi-Intelligence Vehicle Prototypes as an 'Other Transaction'

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The Long Endurance Multi-Intelligence Vehicle (LEMV), a new Army project for a prototype hybrid airship platform to support intelligence, surveillance, and reconnaissance (ISR) missions within forward combat areas, provides an instructive look at an unusual acquisition approach, an Other Transaction.

The LEMV project was driven by an operational need to quickly develop a new air platform for ISR that would be able to stay in the air for extended periods, operate at medium altitude, carry a substantial ISR payload, and be economically supportable within theater.

The LEMV could be a major game changer for ISR, as there are no other systems with its persistence, payload capability, range, and operating altitude, combined with economical operation and support costs.

Because of the limited research and development (R&D) for hybrid airships within DOD and the potential need to use technologies developed outside the traditional DOD community, it was necessary to adopt an atypical acquisition approach conducted outside of the *Federal Acquisition Regulation* (*FAR*). This approach, an Other Transaction (OT), proved highly successful, allowing access to new technology developed outside traditional DOD channels and increased competition during the source selection process.

OTs are a relatively unusual acquisition technique designed to access technology being developed outside DOD by companies that do not traditionally do business with the U.S. government and are not structured or willing to comply with DOD acquisition requirements. The governing statutes exempt OT agreements from the great majority of federal acquisition laws, regulations, and associated policies and procedures, including the *FAR*.

An OT provides tremendous flexibility and requires extensive review before approval. The most comprehensive information on OTs is contained in the "Other Transactions Guide for Prototype Projects" issued by the Under Secretary of Defense for Acquisition, Technology, and Logistics in December 2000 and available on the Defense Procurement and Acquisition Policy website at **http://www.acq.osd.mil/dpap/cpic/cp/specific_policy_areas.html#other_transactions**.

ADVANTAGES TO 'OTHER TRANSACTION' ACQUISITION

Rapid design and prototyping

Increased competition with nontraditional acquisition strategy

Access to non-DOD technology

Requirement Origins

The requirement for the LEMV originated in a Joint Requirements Oversight Council Memorandum from the Vice Chairman of the Joint Chiefs of Staff in June 2008. The Office of the Secretary of Defense ISR Task Force initiated action to obtain funding and start the acquisition process within the Army. The U.S. Army Space and Missile Defense Command/Army Forces Strategic Command (USASMDC/ARSTRAT) was subsequently selected as the technology development and demonstration lead for the LEMV based on its expertise with lighter-than-air (LTA) vehicles.

LTA platforms have been in existence since the 19th century. They are familiar to the public in the form of hot air balloons offering sightseeing tours and commercial blimps such as the Goodyear blimp. DOD used blimps during World Wars I and II, and the U.S. Navy Naval Air Systems Command still operates a small airship that was used to support operations in the 2010 Gulf of Mexico oil leak. The LEMV airship harnesses decades of advances in aviation and materials knowledge compared with these existing commercial systems.

The U.S. government also makes extensive use of tethered, unmanned LTA platforms for ISR missions. It has invested in research for several LTA systems such as the USASMDC/ARSTRAT High-Altitude Airship and HiSentinel efforts, and the Defense Advanced Research Projects Agency Walrus and Integrated Sensor Is Structure projects. However, none of these systems showed a high probability for meeting the LEMV performance requirements for persistence, payload, range, and altitude. The most promising solution meeting the LEMV requirements was hybrid airship technology, in which part of the lift for the airship is aerodynamic.

An Aggressive Schedule

The LEMV project requires the design development, test, and acceptance of the complete integrated system (airship, ground stations, communications, and sensors) within 18 months of award.

Additionally, the LEMV project office was directed to obtain adequate intellectual property rights to pave the way for potential future competitive production of the LEMV.

The aggressive schedule must be accomplished despite the immaturity of the hybrid airship technology. No full-scale prototypes exist for the LEMV, which will be approximately 300 feet long and 1.4 million cubic feet in volume. The system must be mature enough after 18 months to be transported to an area of operations immediately after acceptance, for extensive Joint Military Utilization Assessment (JMUA) within forward combat areas.

This ambitious schedule requires development and fabrication of the airship concurrent with integration of the ground stations, communications, and sensors to enable use within the area of operations during a three-plus-year JMUA. Under the OT, the contractor must also establish logistic support in the area of operations for operation and maintenance of the LEMV during the JMUA.

Nontraditional Contractors Needed

Before the LEMV, hybrid airship technology had only been explored outside DOD by companies at their own R&D expense. No full-scale hybrid airships existed, only small-scale models (60-foot and 125-foot experimental versions). The technology to achieve the required combination of persistence, payload, altitude, and range was unproven. Many of the companies possessing technology critical to achieving the LEMV performance requirements were not traditional DOD contractors and lacked the understanding, systems, and orientation to perform within the standard federal acquisition framework.

Because of this, the USASMDC acquisition team presented an acquisition strategy based on an OT agreement to the Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (OASAALT).

As expected for an acquisition approach that offers such a high level of flexibility, OTs are highly restricted and are subject to an extensive review and approval process.

Following in-depth market research and analysis, OASAALT concurred with the OT approach, which then was approved by the Under Secretary of Defense for Acquisition, Technology, and Logistics in December 2009. After congressional notification, the solicitation was issued in mid-February 2010. An award was made in mid-June 2010, following evaluation of two proposals and negotiation of all offers, to a team led by Northrop Grumman Corp. that included Hybrid Air Vehicles Ltd. of Cardington, England (a nontraditional company), at a cost-plus-fixed-fee amount of $154 million for the initial prototype LEMV system and a total agreement value of $517 million including options.

This team aligned well with the OT legal requirements and intent, bringing Hybrid Air Vehicles' extensive knowledge and hybrid airship technology into the agreement.

Measures of Success

The OT-based acquisition of the LEMV was a success on a number of levels:

- A level of competition was obtained during the source selection that could not have been achieved under a *FAR*-based approach.
- The increased flexibility supported the approach to obtain intellectual property rights for future DOD acquisitions, which will set the stage for competition if the LEMV transitions into a major DOD program. The LEMV contract included obtaining a special license agreement that gives the U.S. government rights to technology developed commercially and at company expense prior to the LEMV project, unlike most technology developed outside DOD and subject to major data rights restrictions. The special license agreement grants the government rights irrespective of whether the technology was originally funded by the contractor, subcontractor, or the government.
- The ability to integrate existing R&D from nontraditional DOD sources resulted in lower development costs and significantly less development time. Use of existing technology outside traditional DOD sources will enable the LEMV to meet its aggressive 18-month delivery schedule. Independent development of this technology through traditional DOD acquisition methods would have been impossible within the required timeline.
- While Hybrid Air Vehicles furnished its extensive knowledge of hybrid airship design and fabrication, it lacked the full system expertise and the managerial structure and experience to manage a large, complex, and highly aggressive project. Northrop Grumman had the managerial experience and expertise to run a difficult project as well as the comprehensive ability to integrate the airship as a complete system, but the company lacked expertise in hybrid airship technology.
- The LEMV entered Critical Design Review in November 2010 and is on track to complete system fabrication and test in mid-2011 before final acceptance and transportation to the area of operation in 2012.

If successful, the LEMV will be considered for transition to a major program and subsequent production under a *FAR*-based acquisition.

The potential market for hybrid airships is significant for both government and commercial markets. The LEMV approach has leveraged existing technology that was privately funded, to decrease government cost and schedule and to advance the technology to the level where it can become commercially viable.

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