



U.S. Rotorcraft Procurements Advance Under Cloud of Budgetary Doubts

By James T. McKenna

Without a budget agreement, the Pentagon would see \$560 billion in cuts over the next decade, in addition to a \$487 billion reduction approved last year. (Photo by David B. Gleason.)

U.S. military services are moving forward with procuring replacements for aging rotorcraft fleets, including Air Force rescue helicopters, Army scouts and Marine Corps presidential transports.

Military and industry leaders also are fleshing out a framework for developing next-generation platforms under the Future Vertical Lift (FVL) strategic plan and its pathfinder component, the Joint Multi-Role (JMR) Medium rotorcraft technology demonstration. In addition, some are assessing how to better nurture the critical skills needed to achieve that goal.

These initiatives are advancing under great uncertainty concerning how much money will be available for them. The gaps they seek to address are critical.

As noted in "Commentary: The Crisis in U.S. Army Aviation" (*Vertiflite*, Jan/Feb 2012), the U.S. Defense Department has successfully developed and fielded only one new rotorcraft in the last quarter century: the V-22 Osprey. Other rotorcraft, while extensively upgraded, are based on 1960s or '70s designs. Even the Army's UH-72A Lakota is based on

the 1979 vintage Eurocopter/Kawasaki BK117 design (the EC145 was originally type-certificated as the BK117 C2).

Given their ages and current operational tempos, current DoD rotorcraft cannot "be incrementally improved to meet future operational requirements," the U.S. Army stated in a December 7 draft Broad Agency Announcement (BAA) for the JMR Technology Demonstration Phase 1. They require "significant improvement in vertical lift, range, speed, payload, survivability, reliability, [operational costs] and reduced logistical footprint" that can only be achieved through new technologies and designs.

Shrinking funds pose the biggest risk to building that future fleet. The most immediate threat as Vertiflite went to press was that of automatic U.S. federal budget spending cuts of \$112 billion a year for the next decade. Defense makes up about 20% of federal spending, but would absorb half of these "sequestration" cuts.

On December 17, Senate and House of Representatives leaders agreed to authorize a base Pentagon budget of \$552.8 billion for Fiscal 2013 (with \$88.5

billion more for combat and other operations). The base budget for 2012 was \$554 billion. If signed by the president, the bill would permit multi-year procurements of Boeing/U.S. Army CH-47Fs and Bell Boeing V-22s for the U.S. Marine Corps, Air Force and Special Operations Command.

An average annual sequestration cut of \$56 billion would equal roughly 9.4% of defense spending. But military personnel and veterans' affairs accounts, combat operations and emergency spending are excluded from sequestration, which Army Gen. Martin Dempsey, Chairman of the Joint Chiefs of Staff, said means that other defense accounts face cuts of 10%.

The sequestration cuts are mandated by the 2011 Budget Control Act if Congress and the White House fail to agree to shrink the deficit by \$1.5 trillion over 10 years through spending cuts and revenue increases. Without that deal, across-the-board cuts of \$1.2 trillion through Fiscal 2021 start January 2, 2013.

The \$560 billion in sequestered cuts to defense required by the Budget Control Act through Fiscal 2021 (and left

to Congress to allocate) would come on top of a \$487 billion, 10-year defense cut planned by the Obama Administration.

Sequestration would be indiscriminate. "We essentially have to go into every budget account ... and take the same percentage out of essentially every line," Frank Kendall, Undersecretary of Defense for Acquisition, Technology and Logistics, said in November.

Regardless of whether sequestration hits, it may have changed the defense funding debate.

On December 4, former senior officials from eight Democratic and Republican presidential administrations called for swift, bipartisan action to reduce U.S. debt. Led by retired Adm. Mike Mullen, former Joint Chiefs of Staff Chairman, these officials said they "strongly believe that our long-term debt is the single greatest threat to our national security."

"In previous eras, increased defense spending may have been required to maintain security," this Coalition for Fiscal and National Security said. "That is no longer the case." Technological advances and changing threats "make it possible, if properly done, to spend less on a more intelligent, efficient and contemporary defense strategy."

So U.S. rotorcraft leaders may have to figure out how to build the future fleet with less money. Here is an update on some of their efforts.



The Air Force's Combat Rescue Helicopter (CRH) solicitation to replace its HH-60G Pave Hawks has resulted in only Sikorsky planning to bid. (U.S. Air Force photo.)

Combat Rescue Helicopter

The U.S. Air Force on October 19 issued a request for proposals for a new combat rescue aircraft. Bids were due January 3.

The service envisions awarding Combat Rescue Helicopter (CRH) contracts valued at about \$6.85 billion for up to 112 rotorcraft, training systems and product support to replace roughly 100 Sikorsky HH-60Gs. The program would acquire nine aircraft in its first phase – Engineering and Manufacturing Development (EMD) – for development testing and operational testing. Low-

rate initial production of 18 aircraft would start in Fiscal 2019; 85 full-rate production aircraft would be procured through 2026.

A key requirement is for contenders to keep their bids' price under \$6.849 billion. After reviewing the RFP, only the team of Sikorsky and Lockheed Martin said it would bid (possibly with a version of Sikorsky's UH-60M or S-92). Boeing declined to bid its HH-47 (which won the last, cancelled competition) or bid the V-22 with Bell. It said those aircraft exceed RFP parameters.

Also, Eurocopter opted not to bid its EC725 Cougar or the NH90 it produces with NHIndustries partners AgustaWestland and Fokker.

AgustaWestland and Northrop Grumman partnered to offer the HH-71 version of the AW101, but cited "an extensive evaluation of customer requirements" in deciding not to bid, apparently leaving the Sikorsky/Lockheed Martin team the sole remaining bidder.

Armed Aerial Scout

The Army has a critical need to replace its Bell OH-58D reconnaissance helicopters given their age and recent, intense operational tempos and the failure of the Boeing-Sikorsky RAH-66 Comanche and Bell ARH-70A Armed Reconnaissance Helicopter (ARH) programs.

In addition to currently planned



Ill-fated programs to replace the aged Kiowa Warrior have been underway since the 1980s. Hopefully, the Armed Aerial Scout (AAS) will finally succeed. (U.S. Army photo.)

Kiowa Warrior upgrades, the Army has been evaluating six other aircraft proposed by contractors. Top Army and Pentagon officials are expected to decide in January whether to opt for one of them or to acquire a new Armed Aerial Scout (AAS) to fill a need for 400-500 aircraft. Kiowa upgrades could cost \$10 million to \$15 million per aircraft; Army officials wonder whether they can buy new for such prices.

Six companies are pursuing an AAS award. Five have conducted voluntary flight demonstrations with modifications to existing aircraft: AgustaWestland with its AW169, Bell with an OH-58D "Block II," Boeing and the AH-6S version of its special forces Little Bird, Eurocopter and the AAS-72X+ variant of its UH-72, and MD Helicopters with an armed version of the MD540F. Sikorsky is proposing the all-new S-97 high-speed compound developed from its X2 technology demonstrator; the Raider is not expected to fly until 2014, but the company emphasized that it had already completed representative flight demonstrations with its X2.

In January, the Army aviation program executive officer, Maj. Gen. Tim Crosby, was scheduled to brief Kendall on a recommended acquisition course. A decision was expected shortly thereafter.

Marine One

The U.S. Navy's Presidential Helicopter Replacement Program (VXX) would replace the Marine Corps' aging Sikorsky VH-3Ds and VH-60Ns by acquiring up to 23 aircraft starting in 2020. It follows a contract won by Lockheed Martin and AgustaWestland with the VH-71A version of the AW101 that was canceled in 2009 due to cost and schedule overruns.

The VXX acquisition strategy is "to hold development to an absolute minimum" and focus "on integration of mature subsystems on a mature platform," according to the November 23 draft RFP. Comments were due December 5 on the draft, which says bidders must propose a baseline, in-production aircraft certified by the FAA or comparable airworthiness authority, or an aircraft with "a clear, imminent



The Navy is starting the Presidential Helicopter Replacement Program (VXX) to replace the venerable VH-3D Marine One aircraft. (Photo by Justin Brown.)

path" to certification.

Since cancellation of the last contract, Lockheed has chosen to handle systems development for prime contractor Sikorsky. AgustaWestland has partnered with Northrop Grumman, which will serve as prime in offering an AW101 variant. Other competitors could include Boeing, offering a version of its H-47 tandem rotor helicopter.

The draft RFP outlines a first phase covering the acquisition of three EMD aircraft and four flight test articles. The service's goal is to issue a fixed-price, incentive-type EMD contract around March 2014. Low-rate initial production and full-rate production would be under fixed-price contracts.

Joint Multi-Role

The U.S. Army is looking for more speed in the Joint Multi-Role rotorcraft, whose development it is overseeing as a precursor to FVL initiatives.

Initial JMR discussions included a speed target of 170 kt plus. But the Army's Applied Aviation Technology Directorate (AATD) officials said configuration studies for the JMR effort by four contractors and a government team, as well as operational analyses, suggest a target of 230 kt or more. They also suggest that only a compound helicopter or tiltrotor can achieve that target.

The configuration studies by AVX Aircraft, Bell Boeing, Boeing, Sikorsky and the government team are scheduled to be completed by March.

A rationale for the higher speed target is that the Army has invested much in wringing out conventional helicopter technology capabilities. While the DoD requirements community's consensus may be that 170 kt plus is sufficient, AATD officials argue that a stretch goal is needed to push technology to the next level.

The December 7 draft BAA on the JMR technology demonstration reflects that. The draft says Phase 1 will address technical risk associated with achieving next-generation "vertical take-off and landing (VTOL) flight performance that greatly surpasses the DoD's currently fielded VTOL fleet," adding that "aircraft designers will need to investigate configurations, technologies and utility aircraft size not common with the current fleet."

Originally, JMR studies included a speed range of 170-300 kt. But the draft BAA stated the need for "a speed of 230+ kt."

A key goal is to foster a wider range of high-speed rotorcraft options that could be incorporated into the FVL-Medium initiative when it begins in about seven years. The Army is leading the FVL-Medium acquisition integrated product team, with participation



Advanced compounds and tiltrotors are the current focus of the Joint Multi-Role (JMR) technology demonstration program to prove out high-speed and other technologies for the planned Future Vertical Lift (FVL) Medium effort. (U.S. Army graphic.)

intended from other U.S. military services.

A November 1 AATD briefing to industry, hosted by AHS, said an operational analysis by the Army's Aviation Maneuver Battle Laboratory at Fort Rucker ran helicopter, compound, and tiltrotor configurations through various mission profiles, including reconnaissance, interdiction attack, air assault, close combat attack, MEDEVAC, and air movement. The analysis found compound helicopter and tiltrotor configurations more effective than the conventional helicopter across all missions studied.

The draft BAA proposes selection of two demonstrator concepts, with an initial design and risk review in the third quarter of Fiscal 2014 and first flight before the end of Fiscal 2017. Total funding is projected at \$213 million, to be split among all awards.

Future Vertical Lift

The goals of the Future Vertical Lift initiative are to improve vertical lift performance and survivability, and significantly reduce operating cost and enable development of new classes of vertical lift to enter service starting in 2030. The Army Aviation Center of Excellence is leading the broad Pentagon effort, which includes input from representatives of the Office of the Secretary of Defense, the other military services and Special Operations Command, the Coast Guard, NASA and others.

The initiative and its goals are outlined in the Defense Department's

Strategic Plan for Future Vertical Lift, which was signed on August 30, 2012 by Deputy Secretary of Defense Ashton Carter.

An FVL Working Group is developing an Initial Capabilities Document (ICD) to describe requirements for a fleet of next-generation rotorcraft known collectively as the Future Vertical Lift Family of Systems. The capabilities defined will include combinations of ambient condition hover, speed, range, fuel efficiencies and troop/payload capacities beyond any current rotorcraft.

Advanced Rotorcraft Initiative

The Pentagon is looking at other ways to drive innovation in vertical lift, preserve critical design and development skills and spur younger Americans to vertical lift engineering careers. Undersecretary Kendall outlined some options in a November 28 speech in New York.

According to news reports, Kendall said the Pentagon is considering funding a new helicopter to preserve critical rotorcraft design capabilities. He pointed out that CRH and VXX are focused on acquiring existing aircraft, not "clean sheet" designs.

"We really need to do something in some cases to preserve our design teams, which once they're gone away, are very hard to bring back," Kendall was quoted as saying.

He had asked defense contractors in October to join an 18-month effort by the Defense Advanced Research Projects Agency (DARPA) to brainstorm U.S. air superiority capabilities beyond the latest-generation F-22 and F-35. The Pentagon could pursue a similar effort on vertical lift, he said.

Congress took notice.

The Fiscal 2013 National Defense Authorization Act directs Kendall to consult with the military services and DARPA on a strategy for using integrated platform design teams and agile prototyping approaches to develop advanced rotorcraft capabilities. He is also required to lay out that strategy for Congressional defense committees within six months of the bill becoming law.

About the Author

James T. McKenna has been writing about aerospace, including fixed-wing aviation, spaceflight and rotorcraft, for more than 25 years. He has served as editor-in-chief of *Rotor & Wing* magazine.



The deeply divided U.S. Congress must work out a deal with the White House on federal spending, including for the Department of Defense. Until this is resolved, the uncertainty is a stifling influence on industry. (Photo by Noclip.)