Future Vertical Lift Gets Closer

By VFS Staff

The Future Vertical Lift (FVL) program continues to move forward on multiple fronts for the US Army and US Navy. Initiated by Congressional direction in 2008, FVL is expected to set the capabilities for the rotary-wing fleet of the United States (and its allies) for the rest of the 21st century. More information and links to past articles from each issue of Vertiflite can be found at www.vtol.org/FVL.

US Army’s FLRAA & FARA

In late December, the US Army sent its draft request for proposals (RFP) for its Future Long Range Assault Aircraft (FLRAA) acquisition program to the two competitors — Bell and the Sikorsky-Boeing team. According to Shephard Press’ “Defence Helicopter” website, “the draft RFP has largely been informed by a series of RFIs [requests for information] and two sources sought notifications previously issued by the Army.”

Since March 2020, the two teams have been working under the FLRAA Competitive Design and Risk Reduction (CDRR) phase that will run until 2022. The final solicitation is expected later this year for the program of record that will take the winning concept into production.

Meanwhile, Bell and Sikorsky-Boeing have continued testing their Joint Multi-Role (JMR) Technology Demonstrators. On Dec. 4, the Bell V-280 Valor clocked its 200th flight hour; the aircraft had made more than 150 sorties prior to the third anniversary of its first flight on Dec. 18, 2017. The V-280 demonstrated a maximum forward flight speed of 300 kt (555 km/h) in March 2019.

The Sikorsky-Boeing team has continued flying its SB>1 Defiant JMR demonstrator. According to a FlightGlobal article on Jan. 25, the aircraft had made 31 flights for a total of 26 flight hours since its first flight on March 21, 2019. The team had also logged 135 hours on its Propulsion Systems Testbed in West Palm Beach, Florida. Sikorsky-Boeing plans to return to the US Air Force’s National Full-Scale Aerodynamics Complex (NFAC), located at Moffett Field in Mountain View, California, in March for additional wind tunnel testing of its one-fifth-scale Defiant model.

In January, the Sikorsky-Boeing team unveiled their “Defiant X” concept to meet the FLRAA requirements as stated in the RFP, leveraging their Defiant JMR demonstrator — which was based on the Army’s 2013 model performance specification. Though not specifically stated, the Defiant X is believed to be slightly larger than the JMR demonstrator to meet the FLRAA range and payload requirements, and to have growth capability for future needs. FlightGlobal quoted Sikorsky FVL director of business development, Jay Macklin, saying that the design can accommodate additional weight without the need for changing the rotor system: “any additional equipment, survivability features, payload, including external lift, can be handled without a significant and costly redesign of key dynamic components.”

The Defiant X featured a number of refinements over the previous operational images of the Defiant. Most notably, the landing gear was changed from a “taildragger” configuration (like a Black Hawk or Apache) to tricycle gear (like an Osprey or King Stallion) — for improved stability and allows for a steerable nose wheel — plus an additional small wheel in the tail fin. Other changes indicate greater emphasis on survivability, such as shielded exhausts, chevron-shaped tail fins and a pointier nose.

Meanwhile, the Army’s Future Attack Reconnaissance Aircraft (FARA) program continues to progress in parallel. The fabrication of the Bell 360 Invictus and the Sikorsky S-103 Raider X (based on its smaller demonstrator, the S-97 Raider) competitive prototypes are progressing towards their first flights in fiscal 2023.
Defiant X configuration changes make it look notably more like the Raider X, which also has edge-aligned vertical fins and a pointer nose than its Raider technology demonstrator.

The Army intends to have both FARA and FLRAA operational in the 2030 timeframe.

**Army Future Tactical UAS**

Meanwhile, five Brigade Combat Teams have been field-testing vertical takeoff and landing (VTOL) unmanned aircraft systems (UAS) for the Army's Future Tactical UAS (FTUAS) program, which will replace the service’s RQ-7 Shadow (see “Mixing Modernization,” Vertiflite, July/Aug 2020). The FTUAS candidates were picked in July 2019: the Arcturus UAV JUMP 20, Textron Aerosonde HQ, L3Harris FVR-90 and Martin UAV’s V-Bat.

The demonstrations are helping to formulate the requirements for a potential FTUAS program of record, according to Col. Scott Anderson, the Army Project Manager for UAS; he spoke at the VFS Autonomous VTOL Technical Meeting / Electric VTOL Symposium in January. The draft Capabilities Development Document (CDD) will be provided to industry by June, with the final CDD submitted to the Army Requirements Oversight Council (AROC) later this year.

One potential acquisition strategy, Anderson said, was to buy small quantities of multiple systems and use them operationally, prior to committing to procuring large numbers of a single UAS.

**US Navy's FVL-Maritime Strike**


The Office of the Chief of Naval Operations (OPNAV N98) directed an AoA to be conducted to support efforts to identify cost-effective alternatives to fill capability gaps in the Navy’s Seahawk and Fire Scout fleets as they begin to reach the end of their service life in the 2030s.

While the media seemed surprised about the plans for a “FVL (MS),” the Navy’s plans have been highlighted in numerous Vertiflite articles (beginning with “Can the FVL Strategic Plan Come Together Like 1, 2, 3?” Nov/Dec 2018), and briefings at VFS events.

According to the RFI, “The MH-60 Seahawk helicopters and the MQ-8 Fire Scout Unmanned Air Vehicles are the pillars of the Naval Helicopter Concept of Operations for the 21st century. The Warfighting Capability provided, whether deployed as Carrier Air Wing squadrons embarked on aircraft carriers under the leadership of carrier air wing commanders or as expeditionary squadrons embarked on LHAs/LHDs [US Marine Corps amphibious assault ships], surface combatants and logistics vessels, is broad and unparalleled in naval warfare.”

The RFI stated that the Navy had identified a requirement to assess potential solutions for capability gaps due to increasingly sophisticated adversaries, as well as gaps incurred with aging and expected retirement of the MH-60 and MQ-8. “Identification of solution options for these gaps for a family of manned and unmanned systems is of paramount importance and is expected to support the broad range of decisions” associated with their upgrades or replacements.

The Navy wants this new FVL (MS) capability to be fielded in the mid-2030s. Alternatives will be evaluated for contributions across the full range of mission areas. The Navy stated that “each unique attribute category was defined to assess potential capability gaps in this timeframe for these scenarios” and listed Intelligence, Surveillance, Reconnaissance and Targeting (ISR&T); Surface Warfare (SUW); Anti-Submarine Warfare (ASW); Mine Counter Measures (MCM); Air Warfare (AW); Electronic Warfare (EW); Search and Rescue (SAR); Command and Control; Special Operations Forces (SOF) Support; Embark Aviation and Air Capable Ships; Conduct Logistics; Conduct Patient Movement; and Signature Control.

The initial capability document (ICD) for FVL (MS) was validated by the Joint Requirements Oversight Council (JROC) in November 2019. It established the requirement for a vertical lift capability to support the US Navy, recapitalizing its existing fleet of MH-60R/S and MQ-8B/C helicopters. The RFI is being conducted to obtain industry input on its ability to potentially satisfy the needs identified in the ICD and inform the FVL (MS) AoA.

**Moving Forward**

This year, 2021, is a pivotal time for FVL. Each of these facets of FVL — as well as the Army’s Air Launched Effects effort (see “Wingman on Demand,” pg. 28) — are all gathering steam and nearing important transition milestones.

The US Congress has provided tremendous support over the 13 years since FVL was launched — partly through the advocacy of VFS. However, the nearly unconstrained spending battling COVID-19 — totaling some $3T in 2020, with another $1.9T under consideration — threatens to curtail the defense budget (see “US Military Rotorcraft Programs: Across Multiple Domains,” pg. 14).

Although FVL is the number three modernization priority for the US Army, fiscal pressure could force a slowdown in one or more of the FVL efforts. New Secretary of Defense Lloyd Austin will have to balance the pace of progress with the threat assessments of potential adversaries.