Over the past several months, the Future Vertical Lift (FVL) program has continued developments in each of its major areas.

FARA is Not Far Away

Brig. Gen. Wally Rugen, US Army, the FVL Cross Function Team (CFT) lead, gave the virtual audience at the VFS 76th Annual Forum & Technology Display an update on FVL progress.

The Future Attack Reconnaissance Aircraft (FARA) program is a competition between the Bell 360 Invictus and the Sikorsky S-103 Raider X. “Ultimately, that’s the Army’s Number 1 priority and Number 1 gap to close — our scout aircraft capability gap,” said Rugen. The two companies have already begun building their FARA competitive prototype (CP) aircraft, and their final designs are in progress. The two companies are due to submit their final designs to the Army in November. “As an Army, we’ll take a month to review those final designs, ensure that we’re ready,” as part of a Final Design and Readiness Review (FD&RR) for each competitor, and then continue towards the FARA CP first flight in first quarter fiscal 2023 (October through December 2022). The first unit equipped (FUE) is still planned for 2028.

Because of COVID-19, Rugen said that Army leadership has done “a number of deep dives at the 3-and-4-star [general] level on FARA to ensure that we’ve fought through the difficulty that industry has had. And quite honestly, our team has had to make sure that we’re on schedule and that continues to be the case. The team has done some tremendous things to keep us on schedule.”

Reviews, such as the critical design review (CDR) for the Improved Turbine Engine Program (ITEP) have been held virtually.

Rugen reiterated that the FARA will be a penetrating asset, hiding in the radar clutter and able to bring both stand-off and stand-in effects to bear. The Army recently completed tests in Project Convergence (see below), which, Rugen said, “was instrumental in showing the efficacy of FARA and the FARA ecosystem. We used some surrogate aircraft [to show] that capability. [It] fought against our pacing threat and our high-payoff threats. And it did extremely well.”

Long-Range Assault

Meanwhile, the Bell V-280 Valor and the Sikorsky-Boeing SB>1 Defiant (Sikorsky model S-100) continue flying as part of the Joint Multi-Role (JMR) technology demonstrations, as part of a two-year extension contract called the Future Long Range Assault Aircraft (FLRAA) Competitive Demonstration and Risk Reduction (CD&RR) phase.

Rugen complimented the industry teams for their progress and said that Congress, the Office of the Secretary of Defense (OSD) and the Army have valued JMR tremendously. “We continue to see flight envelopes pushed, tech readiness levels [TRLs] achieved at higher levels and really applaud the industry and the government team for all they are doing for Joint Multi-Role Tech Demonstration. That most likely will finish up… this fiscal year,” i.e. before October 2021.

The Sikorsky-Boeing team announced that the Defiant had reached 211 kt (390 km/h) in straight-and-level flight and 232 kt (430 km/h) in a descent on Oct. 12, using only about two-thirds
prop torque and engine power — indicating that it will be able to reach much higher speeds. “We are excited about the results we are seeing and what the future holds for our ability to bring this capability to the warfighter,” the news release said. “With every flight, as we continue to increase Defiant’s speed, angle of bank and rate of climb, we are gathering important data, expanding our speed and maneuverability envelope and validating our modeling and simulation tools.”

Meanwhile, during the week of Aug. 24, US Army experimental test pilots from the Redstone Test Center (RTC) trained in the software integration lab (SIL) at the Bell Flight Research Center in Arlington, Texas, before flying the Bell V-280 Valor itself. Similar flights are scheduled later this year for the Sikorsky-Boeing SB>1 Defiant.

Bell has also been conducting wargaming analysis showing the benefit of the tremendous range and speed of a FLRAA like its Valor for the Army and other military services. The company has also given presentations to defense attaches from Belgium and the Netherlands, and other interested parties.

“The V-280 offers strategic projection with tactical execution for unconventional performance,” the Bell website proclaims. With a combat range of 500–800 nm (925–1,500 km) — and virtually unlimited self-deployment range with aerial refueling and auxiliary fuel tanks — the Valor could deploy 12 troops or 12,000 lb (5,450 kg) or more of payload directly to the point of need with much greater rapidity than legacy Army platforms.

Bell also tweeted a photo in late October of what appeared to be Valor radar signature testing. The post included the statement, “The Bell/Army V-280 Valor team recently conducted aircraft survivability tests. Our collaboration with our government teammate continues [to] reduce risk as #FLRAA moves forward. #FVL.”

At Forum 76, Rugen noted that Army leadership held a successful Army Requirements Oversight Council (AROC) review of the FLRAA program — the Army’s solution to the FVL Capability Set 3 requirements. The Abbreviated Capability Development Document (A-CDD) approval on Oct. 2 allows the program to continue towards the next phase. The Army Program Executive Office (PEO) Aviation can now release a draft FLRAA request for proposals (RFP) in the coming months; a final RFP will be released in 2021, for the final downselect in 2022. Despite the pandemic, the service is still maintaining its aggressive schedule for FUE in 2030.

**Big Effects from Small Systems**

The Army’s Air Launch Effects (ALE) program was started two years ago. According to PEO Aviation, ALE is a family of systems “consisting of an air vehicle, payload(s), mission system applications, and associated support equipment designed to autonomously or semi-autonomously deliver effects as a single agent or as a member of a team.” The Army considers ALE to be a crucial piece of the FARA “ecosystem” advanced team concept, “synergistically enhancing survivability, threat identification, targeting, and lethality of Army aviation brigades and ground force commanders’ assets.” As
Bell has amassed more than 180 flight hours and 336 operational hours on its V-280 Valor. (Bell)

The Sikorsky S-103 Raider X is nearly 25% heavier than its S-97 Raider. (Sikorsky)

An A-CDD for ALE was signed in May and ALE systems were extensively tested as part of Project Convergence at Yuma. (US Army)

Meanwhile, five Brigade Combat Teams have been field-testing unmanned aerial vehicles (UAVs) for the Army’s Future Tactical Unmanned Aircraft System (FTUAS) program, which will replace the service’s RQ-7 Shadow. The FTUAS candidates being tested are the Arcturus UAV JUMP 20, Textron Aerosonde HQ, L3Harris FVR-90 and Martin UAV’s V-Bat.

Rugen said that — in contrast to legacy UAVs — being able to “bring these aircraft that are not tied to a runway forward into the hands of our [cavalry units], both air and ground, was a tremendous game changer. No longer back at the brigade support area, they’re forward with our scouts. That runway independence alone is really transforming our tactical UAS capability. The fact also that we’re moving them around with a Chinook or less — with Army organic assets — again, is a game changer.”

Rugen said that the FTUAS testing was part of a “Buy/Try/Inform” effort. FTUAS will have its capability development document review by the AROC next quarter, which is intended to result in the start of an official FTUAS acquisition program of record.

The Army still plans to initiate an Advanced UAS (AUAS) program under FVL at some point in the future. This will be a much larger, long-range and long-endurance unmanned aircraft designed for conflicts envisioned in the 21st century. With FAR and FLRAA now both reaching FUE by 2030, AUSA has taken a back seat in priorities.

Finally, Rugen said, the Army was continuing its testing of the Rafael Spike Long Range Precision Munition, with FUE in fiscal year 2023. Tests of the system were conducted last year, and the AROC approved the Israeli non-line-of-sight (NLOS) missiles as an interim solution on the Apache for greater stand-off in long-range engagements.

Delivering on its Promise

When FVL was first initiated by then-Secretary of Defense Robert Gates in 2008, it was envisioned as a replacement of today’s helicopters with far more capable rotorcraft. The Army and industry have continued along a challenging plan to deliver the world’s most advanced systems for the warfighter — with greatly improved speed, range, supportability and affordability than possible by continued upgrades to legacy systems.