JMR Proves Its Military Merit

By Mike Hirschberg, VFS Executive Director

The Future Vertical Lift (FVL) program was initiated at the behest of the US Congress in 2008, and the first study contracts were awarded in June 2011 under the Joint Multi-Role (JMR) science and technology (S&T) initiative. JMR was launched as a way for the US government to help fund company technology demonstrators so industry could show the art of the possible with a truly clean-sheet design.

It’s important to note that JMR was launched by the US Army’s S&T community as a “best guess” of what future Army requirements might be. The design specifications for a 30,000-lb (13.6-t) medium class utility rotorcraft were partially based on the fact that the biggest “bang for the buck” was in targeting a replacement for the 4,000 Black Hawks in service with the Army — with the long range and high performance informed by the lessons learned from the conflicts in Afghanistan and Iraq — and the understanding that a medium-class aircraft could be scaled up or down to meet whatever actual future requirements might be.

Like X-Planes, the two selected demonstrators — the Bell V-280 Valor and the Sikorsky-Boeing SB>1 Defiant — were not intended to be prototypes, but rather to prove the companies’ approaches for next-generation utility rotorcraft. However, the competing teams went well beyond minimum expectations, proving the military utility of their concepts.

As the two aircraft continue flight testing under contract extensions, US Army military personnel are getting more exposure to the JMR demonstrators and becoming more familiar with their capabilities, and — more importantly — with the promise of the FVL’s Future Long Range Assault Aircraft (FLRAA) that will be developed from the winning team’s JMR-derived concept and operational by 2030.

Valor & Defiant

US Army Chief of Staff General James C. McConville and other senior leaders visited the Sikorsky Development Flight Center in West Palm Beach, Florida on Oct. 22 for an SB>1 Defiant flight demonstration.

According to a US Army article on Nov. 9 credited to the FVL Cross-Functional Team (CFT), “Both Industry teams have made significant contributions to the tech demonstrator program and have provided invaluable flight data to the Army requirements developers for FVL platforms.”

Coming off the heels of the Army Requirements Oversight Council approval of the Abbreviated Capability Development Document (A-CDD) for FLRAA (see “FVL Delivers,” Vertiflite, Nov/Dec 2020), the Army Chief of Staff took the opportunity to visit each of the tech demonstrators for a firsthand assessment of their transformational vertical lift technologies.

“We’re flying before buying” with the robust demonstrations of the JMT technology demonstrators, McConville stated. “I’m excited to see what everyone is doing to transform army aviation.”

The flight demonstrations showcased advances in vertical lift technologies, not just in terms of increased speeds, but level one handling qualities and range as well. “FLRAA will see significant improvements in reach,” said Brig. Gen. Walter Rugen the director of the FVL CFT. "Reach is defined as speed, range, and endurance at range and we expect to see two and three times the reach with FLRAA over our current fleet.”

Flying at twice the speed and three times the range of the current UH-60 fleet, FLRAA will provide transformational advances in terms of lethality and survivability in Multi Domain Operations with significantly enhanced air assault and aero medevac
capabilities, the Army article said. These advancements will prove critical for Army operations in a theater like the Indo-Pacific where the dominant geographical feature is water, as land forces remain the predominant military force in the majority of nations in the region. FLRAA’s extended reach will increase the US Army’s ability to move forces while overcoming the tyranny of time and distance. “It’s the technology that allows you to do these type of things and now you can do them a lot faster, a lot further,” McConville said.

Brig. Gen. Robert Barrie, the Army Program Executive Officer (PEO) for Aviation, remarked, “The government and industry investment in the JMR-TD aircraft has had a significant impact in reducing risk prior to moving into the FLRAA program of record.”

Affordability is a critical element of the FLRAA program with operating and support costs estimated to be approximately 68% of the overall lifecycle costs. “We’re taking what we’ve learned through JMR-TD and baking those lessons into our requirements to drive down operating and support costs of the aircraft,” Rugen said.

Meanwhile, the Army posted a “Pre-Solicitation Notice for the Future Long Range Assault Aircraft” on Dec. 9, explaining that it intends to provide the FLRAA request for proposal (RFP) “utilizing other than full and open competition” (i.e. to the two teams only) so any other company that thought it could deliver needed to notify the Army within 14 days. This included a preliminary design review (PDR) in fiscal year 2022 and other key programmatic milestones, including initiating prototype assembly by June 2023 and delivering eight low-rate initial production (LRIP) aircraft and “all associated support equipment required to conduct operations” no later than fiscal 2030.

**Additional Next-Gen Rotorcraft**

Although the medium-class JMR technology demonstrators extended well to the companies’ proposed FLRAA operational concepts, the aircraft themselves did not enjoy such a direct path to the other major FVL program underway. The Future Attack Reconnaissance Aircraft (FARA) competitive prototype competition pits Bell’s 360 Invictus single-main rotor winged-compound against the Sikorsky RaiderX rigid-rotor thrust-compound coax design. While the RaiderX has the same architecture as the Sikorsky-Boeing Defiant, the configuration is a larger version of Sikorsky’s S-97 Raider, which preceded the JMR program by several years. Nonetheless, the government-supported technology development of the JMR technology demonstration program clearly revitalized the design and development capabilities of both companies competing for FARA. First flights for the two prototypes are expected by the end of 2022.

As detailed at Forum 76 and previous VFS conferences, NATO has been conducting Next-Generation Rotorcraft Capabilities (NGRC) studies (see “Forum 76: Survivable, Sustainable, Resilient,” Vertiflite, Nov/Dec 2020 and “US Army Working with NATO on DVE and Next Gen Rotorcraft,” Vertiflite, May/June 2017).

On Nov. 19, NATO announced that the defense ministers of France, Germany, Greece, Italy and the UK had signed a letter of intent (LoI) to develop a medium-class multi-role rotorcraft as part of their efforts to modernize their helicopter fleets. A significant number of medium multi-role helicopter capabilities currently operated by Allies will reach the end of their life cycle in 2035–2040 and beyond, with the subsequent need for replacements.

The NGRC — designated as a NATO High Visibility Project (HVP) — aims to develop a solution for these upcoming requirements, leveraging a broad range of recent advances in technology, production methods, as well as operational concepts.

Over the coming years, experts from these and additional nations (including the US) will cover an exhaustive program of work, starting with defining a robust Statement of Requirements and a multi-phase cooperation plan. “By investing our resources and channeling our development initiatives through a multinational framework, we are making sure Allies are equipped with the best available capabilities, which helps to maintain NATO’s technological edge,” said NATO Deputy Secretary General Mircea Geoană.

The US Army and industry have been active in the NGRC studies over the past several years, and the JMR demonstrators have informed the US Allies of the potential of next-generation rotorcraft. Whether the NGRC studies result in launching all-new aircraft, or co-production of FLRAA aircraft or derivatives remains to be seen. Airbus declared its interest in collaborating or taking the lead in developing the resulting military platform, with both it and Leonardo well along in developing their next-generation civil rotorcraft for the European Union’s Clean Sky 2 joint undertaking.

Regardless of the specific aircraft that are eventually fielded, the JMR technology demonstrators begun in 2011 have paved the way for a new generation of high-performance rotorcraft to support the military services of the United States and its allies for decades to come.