The Evolving VTOL Workforce

By Angelo Collins, Executive Director

The Vertical Flight Society leads advocacy efforts to advance vertical flight, bringing together members from industry, academia and government to tackle the toughest challenges. In this role, it is our responsibility to sound the alarm: the vertical takeoff and landing (VTOL) aircraft workforce is at a critical juncture.

What was once thought to be positive momentum, with the US Department of Defense (DoD) kicking off several multi-billion-dollar rotorcraft acquisition efforts, has soured: the Army’s cancellation of its Future Attack Reconnaissance Aircraft (FARA) program places future research, development, test and evaluation (RDT&E) funding for vertical flight at risk. With funding still in play, now is the time to advocate internally for advancements in vertical flight technology. Now, more than ever, it’s critical that we weather the storm and ensure the engineering workforce will be capable of leading cutting-edge rotorcraft developments in the future.

The “Electric VTOL Revolution” is faring better and still requires thousands of new engineers to continue gathering momentum. In 2020, VFS forecasted that 10,000 additional engineers were needed this decade to support planned military and civil rotorcraft developments, as well as the burgeoning electric VTOL/advanced air mobility (AAM) market. The cancellation of FARA provides the potential for some engineers to stay within vertical flight by moving to AAM, but this is clearly not enough.

So, what can be done to fix the shortage of engineers? First step, it’s critical that we analyze the current landscape, which consists of significant volatility in the present workforce. In recent years, private investment in aviation has offered new and intriguing opportunities for both new graduates and tenured engineers alike. “Vertical flight” had generally seen most investment derived from the defense sector, but it is no longer the only game in town. These new opportunities are attracting some of the top talent from legacy rotorcraft manufacturers and defense contractors, what we at VFS call the Brain Drain 2.0.

In the 1970s, Congress limited appropriations for defense research at the Defense Advanced Research Projects Agency (DARPA) only to projects with direct military application, precipitating a significant departure of talent. These were dark days for the defense research sector, but the silver lining of this Brain Drain 1.0 was an apparent boost in the development of the fledgling personal computer industry. If the DoD and defense sector wish to compete and ensure a healthy pipeline of engineers is available and interested in defense-sector employment, more needs to be done.

One critical action is to motivate students of all science, technology, engineering and mathematics (STEM) majors to get excited about vertical flight. The VFS Atlanta Chapter recently organized a Regional Mobility Panel for the local Georgia Tech students, and it was a great success. Many of the students in attendance were not studying aerospace engineering, and most were not aware of AAM. Events like these can improve the ability of rotorcraft and AAM companies to reach students from various STEM disciplines — including electrical, computer and mechanical engineering students — and can help to grow the workforce. Chapter president Carlota Bonnet is currently working on a template to replicable the event so that other chapters can run similar meetings for outreach with their local student chapters.

Another key enabler to ensure we grow the workforce is through the Vertical Lift Research Centers of Excellence (VLRCOE). Georgia Tech, University of Maryland and Penn State —
along with their dozen or so affiliate schools — lead the way in cutting-edge vertical lift research and education in the US. Funding these centers is one of the Vertical Flight Society’s key areas of advocacy within Congress (see “VFS Raises VLRCOE Profile to Congress,” Vertiflite, July/Aug 2023), with literature including a white paper for Congressional consideration, in cooperation with the Vertical Lift Consortium. We will set up meetings again this year with various congressional staffers and elected leaders to increase VLRCOE funding so that more students can be educated through these centers.

Educating the younger generation alone is not enough to grow the workforce; we also need to train the mid-career and even senior employees. Many trying to enter the growing AAM sector do not have relevant experience and are looking for opportunities to learn the skills required to do the job. VFS offers opportunities in the form of events, short courses, technical reference material and other resources to help these mid-career and senior staff begin the process of entering the AAM workforce. Those interested can become acquainted with the major players, the various roles and responsibilities, and where they may best fit in the community.

Lastly, to know the workforce, it’s important that engineers also climb the management ladders at their respective companies. Many executives today do not have engineering backgrounds, which can be detrimental to the growth and future of a company whose backbone is its engineering excellence. Shortsighted priorities, such as quarterly profits, tightening margins and a stockholders-first mentality, coupled with a revolving door of executives who only serve a short term, will negatively impact the health and culture of a company. Prioritizing employee satisfaction, continued education, fulfillment and mentorship is critical if we want to see these companies survive or prosper in the coming years.

As the leading advocacy group for vertical flight technology — and the sector’s global engineering professional society — it is important to highlight the workforce challenges we face. If you have ideas or recommendations, please do not hesitate to take action through your partners at the Vertical Flight Society. Our door is always open, and we welcome your passion and ambitions for the future of vertical flight.

What do you think? Let me know at director@vtol.org.

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