

NAVAL AVIATION NEWS

Team Investment Saves CH-53K Program Schedule, Strengthens Small Business

By Victoria Falcón / Published Dec. 21, 2022
PATUXENT RIVER, Maryland,

Ingenuity, oversight and a capital investment by the production department for Naval Air Systems Command's Heavy Lift Helicopter Program Office helped transform a struggling U.S. manufacturer into a modern, dependable production source for aircraft fuel cells and avoided the potential failure of a critical Department of Defense (DOD) supplier.

The team's actions also eliminated persistent schedule delays for the Marine Corp's brand-new heavy lift helicopter, the CH-53K King Stallion.

Amfuel is a small business in rural Arkansas that manufactures self-sealing fuel cells for the CH-53K and 26 other DOD aviation platforms. A fuel cell is a rubber ballistic fuel bladder that adheres to the inside of the aircraft's fuel compartment and can self-seal in case of puncture by gunfire during a firefight. Amfuel is one of three DOD critical suppliers who produce these type of fuel cells. It is the only critical DOD supplier with the intellectual property to produce the CH-53K fuel cells and one of only two suppliers with that capability. The production shutdown of any of these critical suppliers would threaten the well-being and stability of the DOD industrial base to meet national security threats.

In 2020, Amfuel had recently emerged from bankruptcy and was on the brink of leaving the industrial base. It was a company under new ownership and dealing with the trials of a pandemic. The company faced challenges with failing or dead equipment, quality control issues, and meeting production rate needs of the CH-53K due to World War II-era aviation manufacturing equipment, processes and infrastructure.



Marines return to USS Mesa Verde

An CH-53K Super Stallion with Marine Medium Tiltrotor Squadron 365, 24th Marine Expeditionary Unit, departs from USS Mesa Verde to return Marines and Sailors from a simulated non-combatant evacuation / military assisted departure mission, Jan. 17, 2017 during Composite Training Unit Exercise. COMPTUEX is the 24th MEU's final at-sea evaluation designed for Marines and Sailors to increase operational efficiency before deployment.



An Amfuel employee stands inside the new large autoclave purchased as Government Furnished

“It was not hard for the team and senior leadership to realize the criticality of sustaining this DOD supplier that manufactures a very specialized product for U.S. military aviation,” said William Winters, co-lead of the production integrated product team for the program office. “The team applied critical-thought and outside-the-box thinking to evaluate tooling-equipment requirements needed.”

According to Winters, the production team then developed a rapid acquisition strategy to procure the items as government furnished property. This effort was to safeguard the production of CH-53K fuel cells and sustain production of this DOD aviation-critical component.

Amfuel’s new owners made significant investments in basic elements to keep the business operational, such as raw materials and labor. But additional help was needed quickly to refurbish Amfuel’s antiquated facilities and acquire needed equipment to sustain production rates required to meet existing DOD demand.

To safeguard against a shutdown by Amfuel and to ensure a strong U.S. industrial base for this critical component, the program office’s production department implemented a rapid acquisition strategy to procure 18 pieces of equipment to facilitate modernization of the Amfuel manufacturing process. That equipment included both large and small autoclaves, a robotic spray system, automated control of machining tools, ovens, coordinate-measuring machines and research-development lab equipment.

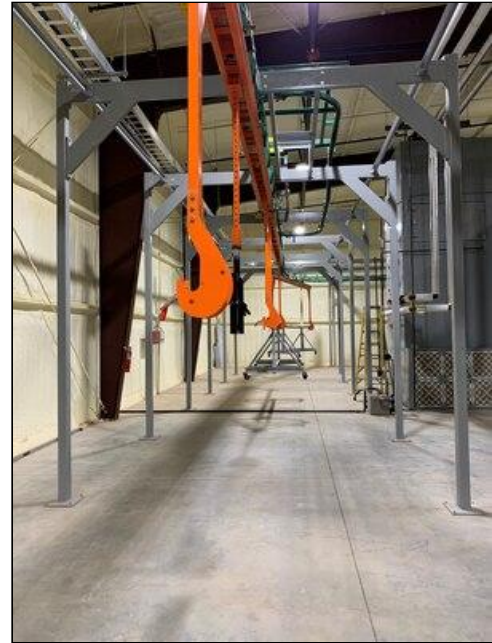
Amfuel was also able to divert some additional funding to partial roof replacement, which became a significant investment as the company faced a hurricane, a tropical storm and a 2-foot snowfall within six months of repair. In areas where funding was unavailable for repair, Amfuel experienced roof collapse from the snowstorm.

“It is not an overstatement to say that without the expedited effort of our team, the CH-53K would have had a production gap and/or complete loss of a DOD critical supplier due to infrastructure collapse during the 2020 snowstorm,” Winters said.

A multi-disciplinary government team, along with Amfuel, oversaw the design, procurement, production and installation of the new equipment. That oversight included supplier site visits to assess manufacturing capability, planning and ability to meet government requirements as Amfuel gained more solid footing on the path to recovery.

Equipment and used in the production of CH-53K fuel cells.

An Amfuel employee stands inside the new large autoclave purchased as Government Furnished Equipment and used in the production of CH-53K fuel cells.



Photos courtesy of Amfuel

The overhead conveyor system used for the new Robotic Spray Facility purchased as Government Furnished Equipment and used in the production of CH-53K fuel cells.

During the first year following these capital investments, Amfuel more than tripled production.

“Amfuel is currently a sole-source supplier for CH-53K fuel cells,” Winters said. “Prior to these investments, they were producing one fuel cell shipset (four bags) per month for our aircraft, and experiencing quality issues. Now they are making six fuel cell shipsets per month. More important, the multi-disciplinary government team has positioned this critical supplier to have the manufacturing capability and processes in place to support full-rate production of the CH-53K aircraft.”

Another positive impact from the new tooling equipment is the reduction of defects found in the bags.

“By focusing our energy on assisting Amfuel, defects in CH-53K fuel bags have been reduced from an average of 475 in 2021 to under 200 in 2022, a 58 percent reduction that continues to trend downward,” Winters said. A defective fuel bag is unusable by the government and must be either reworked or scrapped. “To date, Amfuel has shipped 42 bags through the new production system and not one of them has had a defect.”

According to Amfuel representatives, the improvements have prevented more than \$1 million in potentially scrapped fuel cells.

Additionally, the company was eventually able to obtain Defense Production Act Title III funds for new infrastructure and structural repair. Title III funds are used for strategic and critical materials necessary for timely availability of essential domestic industrial resources to support national defense and homeland security requirements.

“Our investment of people, time and money into this critical DOD supplier has provided stability into this sector of the industrial base,” Winters said. “We were able to expedite the installation and operational availability of the new tooling and equipment to quickly improve production efficiencies and reduce quality control issues.”

The timely actions of the production team have helped to sustain a critical DOD aviation fuel cell supplier for both the CH-53K and 26 other DOD aviation platforms as the U.S. continues to face ever-growing global threats.

Victoria Falcón supports strategic communications for the H-53 Heavy Lift Helicopters Program Office. 🇺🇸