FLYING HIGH

GE Aviation at Center of Engine Excellence

By Tom Schuman

Jet engine assembly is big business, with Lafayette at the global core. The GE Aviation facility in the manufacturing corridor on the south side of the city is one of just three in the world producing the highly-popular LEAP (Leading Edge Aviation Propulsion) engine.

Three is also the key when it comes to the company's strategy for success. A combination of talent, technology and teaming is required to produce the engines that are serving the Boeing 737 MAX and Airbus A320neo family of aircraft.

A LEAP 1A (for the Airbus A320neo family of aircraft) compressor joint is being torqued by an automatic wrench that was designed by GE technicians. The joint cannot be reached by traditional tools.

Eric Matteson, a 23-year GE veteran, is the plant leader. He describes the realities of today's jet engine assembly.

"In a jet engine, there are a lot of parts. Putting it together becomes more of a piece of art in what you are looking for. It's more manual (than automotive assembly), using high-tech tools and equipment to do it."

Thus, the combination of people (talent and teaming) and equipment (technology) is essential. The Lafayette workforce is expected to grow to 300 by the middle of 2019 in order to move from producing seven or eight engine units (complete engine or the core that produces all the energy) a week today to five per day by 2020.

Up and running

When GE Aviation announced the Lafayette facility in March 2014, it was the company's seventh new operation in as many years. Matteson – at work at the sister facility in Durham, North Carolina at the time – had experience in setting up new assembly lines. This time, he was asked to do the same and put a building around it. He started with a 100-acre field and a blank slate.

"Part of the success of building it so fast (completed 53 weeks after the first shovel was put in the ground) is we did it as a design build. The city, the county and the state all worked together," he explains. "They were willing to look at our drawings before (official) submission and by the time we submitted, it was just a matter of days to issue permits. We had an open-door policy for inspectors and engineers to come on-site.

"The win is that we could partner with the governments to mobilize extremely fast. When I look at what it takes to be successful and why we chose this site, it was around economic development; it was around bureaucracy busting; it was around the universities; and it was around cultures – work ethic, commitment. Those four things are why GE Aviation chose Indiana.

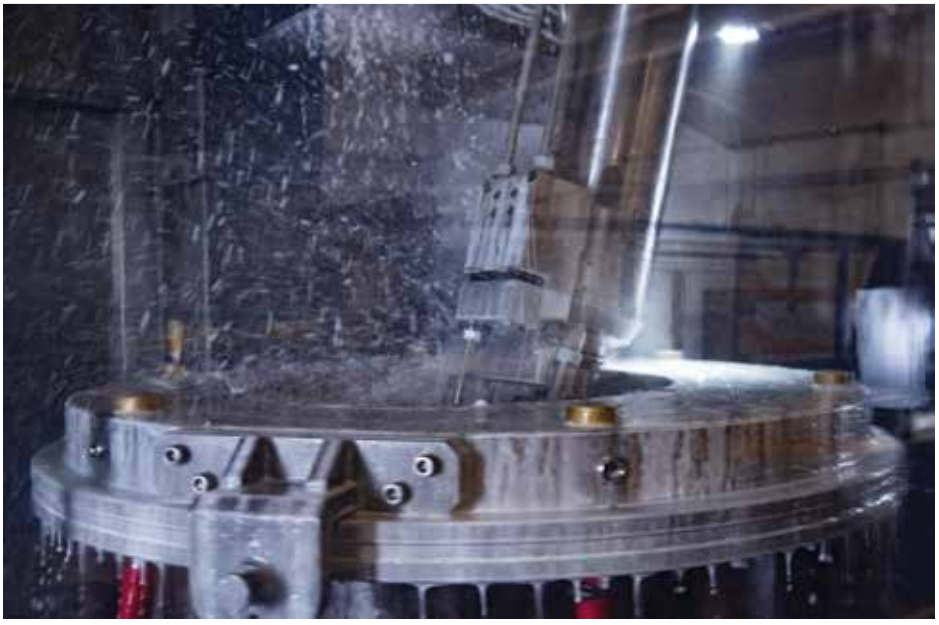
"To me, one of the great stories is how well Indiana works across boundaries to find solutions for customers."

Talent and teamwork

Matteson also credits Purdue University and Ivy Tech Community College for assisting with the first of the three strategic ingredients – talent. Both have lead roles, with assistance from other schools inside and outside the state, in creating a development pipeline. Ivy Tech initiated a new course in Lafayette as part of its effort.

"We do require a FAA (Federal Aviation Administration) powerplant license to be a technician here. It's not four-year degrees we're looking for," he shares. "It's certificates and licenses you can get

The LEAP 1B (for the Boeing 737 MAX) core is mated to the fan in final assembly (top). Stage 2 nozzle sub-assembly is a 12-hour process that grinds all of the assembled parts in the module to specific tolerances.



out of high school, you can get out of the military, you can get out of a two-year degree program. There are a lot of paths to do it. There is a huge demand and they (the jobs) pay really well. We need more and the industry needs more."

GE Aviation is using social media channels to reach potential employees currently in other fields or even in other states. Long term, "it's getting involved in local schools – and I'm talking middle schools," Matteson contends. "To effect change, the decision process starts there.

"Manufacturing has changed. The industry has changed. It's a great opportunity to get more women involved and we're working to do that. We participate in the community and workforce, workforce, workforce is what we talk about."

Teaming is how the talent, once in place and trained, gets the job done. Matteson says it's a way to transform a business to be modern, adaptable and possess an entrepreneurial spirit. He elaborates.

"It's a self-directed team environment. There are no managers, no supervisors. It's 100% flat. Everybody reports to the plant manager. Technicians are hired through a careful selection process, brought on board to train by their peers and their job is to work together through whatever hurdles to ship the engines on time with high quality and on budget. It creates a more rewarding, diverse environment for employees."

Data analytics are an important skill for GE Aviation workers. Matteson ties the talent and teaming approach to the technology.

"Schools are very good at focusing on the technology, but we need the data analytics because the equipment is smarter. We're on that bleeding edge with this shop. It's the Internet of Things. It's great to have a lot of things tied to the internet, i.e. our engines, but unless you can do something with the data (he reports that less than 1% of the available data gets analyzed), you can't covert it into actionable things so you can make smarter decisions faster."

Technical advances

Technology is the third piece of the "t" equation. Matteson cites the latest grinding and torqueing equipment, vision inspection and laser placement systems, and closed loop

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The Engine and the Facility

LEAP

- Fastest-selling engine in aviation history
- More than 14,000 engines on order
- Delivers 15% better fuel consumption than the CFM 56 (which it replaced)
- About 50% lower emissions and 50% quieter
- Contains 3D woven carbon fiber composite fan blades and fan case
- 3D printed parts include fuel nozzles
- Powers the Airbus A320neo, Boeing 737 MAX and Comac C919 aircraft
- Production ramping up to more than 2,000 engines annually by 2020

GE Aviation (Lafayette)

- 300,000-square-foot facility
- Company investment: $110 million plus
- Timeline: Plant announcement, March 2014; groundbreaking, August 2014; construction begins, September 2014; building complete, September 2015
- Employees: 79 technicians and 21 support team/leaders (November 2017); plans to grow to 165 and 33, respectively, by end of 2018 and 300 total (230 to 250 GE employees and 60 contractors – dock operations, maintenance, security, etc.) in 2019
- Supplier base: About 400 for the LEAP engine, more than 5,000 companywide