Gulf Coast Reporters' League

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AEROSPACE NEWSLETTER

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***Editor's note**: This is the first of a four-part series focusing on aerospace and defense activities in the states that are members of the Aerospace Alliance.*

NASA photo

Aerial of Michoud Assembly Facility looking south, with Old Gentilly Road at the bottom and the Intracoastal Waterway at the top.

Economic development

Louisiana's aerospace footprint

The western-most state of the Aerospace Alliance is a key player in aerospace thanks to a NASA facility, but it's also home to a bomb wing, MROs, aircraft assembly and more...

The massive Michoud Assembly Facility in East New Orleans has been an integral part of NASA's space program since the early days of the agency.

It has 2.2 million square feet of manufacturing space under one roof, an area large enough for 31 football fields, making it one of the largest manufacturing facilities in the world. It was where Saturn Vs were built and later the fuel tanks for the Space Shuttle. And today it continues its role.

At Michoud Assembly Facility (MAF), Lockheed Martin is building the Orion Multi-Purpose Crew vehicle and Boeing the first stage of the Space Launch System, a NASA program will take astronauts deeper into space than ever before.

"Louisiana, and specifically, Michoud, is the critical nexus for the refinement of prototypes and the manufacturing of final assemblies for those space flights," said Don Pierson, Secretary of Louisiana Economic Development (LED). "We're proud to host that aerospace production in Louisiana, and proud of what it represents for our nation."

For Louisiana, a member of the four-state Aerospace Alliance, the NASA facility is enough to make the state a major player in aerospace. But there's a lot more.

Workers in the state do subassembly work on Bell Helicopters along the Interstate 10 corridor in Lafayette. Further west there are maintenance, repair and overhaul facilities at Chennault International Airport and in Alexandria there's England Airpark. In northwest Louisiana is Barksdale Air Force Base, home of the 2nd Bomb Wing's B-52H Stratofortress bombers.

According to LED, Louisiana has 6,200 aviation and aerospace jobs. The Department of Transportation and Development counts nearly 60,000 and $1.8 billion in annual payroll directly supported by the 68 public-use airports in the state. It also has 82 LED certified sites in 32 parishes, indicating they are ready to develop.

Pierson said aerospace is one of nine industries where Louisiana has a strong presence or strong growth opportunities. "In the case of aerospace, it's both. We're strong now, and we see great potential for the future of aerospace in Louisiana," he said.

Five distinct centers for aerospace are located in the state. Two are former bases that closed and are now commercial centers. Three of the five are along the Gulf Coast I-10 corridor.

In the Paris Air Show in June, Louisiana pursued major and minor component suppliers for aircraft, rotorcraft and space flight.

"We have an intriguing pipeline of prospects that we've been accruing over time, at many air shows and prospect-specific visits to headquarters and operational sites," Pierson said. "We came back from Paris enthused, and ready to hit the airstrips and hangars and the corporate boardrooms that power them."

New Orleans

New Orleans, home of busy Louis Armstrong International Airport, is also home to NASA's MAF and the military's Naval Air Station Joint Reserve Base (NAS JRB) New Orleans in Belle Chasse.

The Michoud center puts the city in a select league of locations with NASA operations, traditionally a lure for companies. Within the multi-tenant facility is the National Center for Advanced Manufacturing (NCAM), a research and production center focused on applying advanced manufacturing technologies to lightweight composite and metallic materials in support of the NASA space program and adjacent industries.

From 1979 to 2010, MAF produced 136 fuel tanks for the Space Shuttle program, which followed the site's production of Saturn booster rockets for the Apollo missions beginning in 1961. Today it's home to more than 3,000 federal and private-sector workers.

"By the end of 2017, we believe Boeing may well be pushing toward employment of 700 as activities accelerate in the space program," said Pierson. "We're seeing growth and diversification with other subcontractors and non-NASA development."

MAF's proximity to Mississippi's Stennis Space Center, where rocket engines are tested, makes the area along the state line a hot spot for space activities. In 2008, there were meetings to establish a Stennis-Michoud group to jointly promote the two, but it appears to be idle. In 2010-2011, the International Economic Development Council did a marketing strategy for a Stennis-Michoud Technology Corridor to "help build cooperation and collaboration … in growing and sustaining this technology corridor..."

"The IEDC team believes that the region is in need for a major marketing effort to brand the technology corridor and raise awareness of its valuable technology assets," the study said.

Having two sites actively involved in space exploration programs "presents a unique opportunity to grow and attract other similar technology-based businesses to this multi-state region," the study said.

Combined the two NASA sites have plenty of acres to develop. MAF has 600 acres on site and hundreds of additional acres outside the site. Stennis Space Center also has several thousands of acres within its buffer zone.

South of Michoud, NAS JRB New Orleans is home to a Navy Reserve strike fighter squadron, a fleet logistics support squadron, a Coast Guard Air Station, detachment of a Marine Reserve light helicopter attack squadron and other Navy and Army activities.

Its two-runway military airport south of downtown New Orleans, is used by F/A 18 Hornets, F-15 Eagles, UH-1Y Huey, AH-1 Cobras, C-130 Hercules and MH-65 Dolphins. It's part of a large Gulf Coast military aviation complex that includes all branches of the military and spans the region between New Orleans and Panama City, Fla.

Lafayette

525 Relentless cabin. *Bell Helicopter photo*

A roughly two-hour drive west from New Orleans is the city of Lafayette, fourth largest city in Louisiana and best known for its petroleum and gas industries. But it's also the site of the 82,300 square-foot Bell Helicopter assembly facility at Lafayette Regional Airport.

Funded by the state in an intergovernmental agreement, the facility is owned by Lafayette Regional Airport with Bell Helicopter as the long-term lessee. It began operations in 2015 with assembly of the Bell 505 Jet Ranger X.

"As you know, there have been some recent headwinds in the rotorcraft industry, and Bell has had to adjust some of its production schedules among facilities in Canada, Texas and here in Louisiana," Pierson said.

In May 2016, Bell said it was moving final assembly of the 505 from Lafayette to Mirabel, Canada, but in exchange Lafayette would do cabin subassembly work on the Bell 525 Relentless, which had been done in Amarillo, Texas. In addition, modification work on the Bell 407, platform for the Northrop Grumman MQ-8C Fire Scout unmanned aerial vehicle, would move from Ozark, Ala., to Lafayette.

Pierson said the facility will create 95 to 100 new direct jobs averaging $55,000 a year, plus benefits. Bell also is retaining 60 additional employees in components parts (composite helicopter panels) and service operations that already existed in the Lafayette-Broussard area.

Bell brings new assembly operations to a market where Louisiana already has a strong presence in helicopter transportation services for offshore oil and gas exploration and production in the Gulf of Mexico, Pierson said.

There's additional aerospace activities south of Lafayette.

"We have AvEx (Aviation Exteriors Louisiana), which is a world leader in precision painting for aircraft exteriors, located in this region in New Iberia," Pierson said about the company in the town 30 miles southeast of Lafayette.

And between New Iberia and Lafayette in Broussard, there are two OEM service facilities for composite panels and rotor blades.

Lake Charles

Slightly more than an hour's drive west from Lafayette along I-10 is Lake Charles, fifth largest city in Louisiana. Known for petrochemical production, Lake Charles is also home to a former military base established in 1941 that made a successful transformation to commercial operations.

Hangars at Chennault. *Courtesy photo*

Lake Charles was the site of an Army school for aviators during World War II. It was closed after the war but reactivated in the '50s and became part of the Strategic Air Command. By then renamed Chennault Air Force Base, its military mission ended in 1963.

In the mid-80s the push was on to use it for economic development, with its marketable 10,700-foot long, 200-foot wide runway and the extensive property available for tenants.

Today's Chennault International Airport has, according to Pierson, "what could be one of the premier, available wide-body hangars in the United States, along with ramp space capable of supporting any type of aircraft."

Chennault's mix of maintenance and paint hangars provides aircraft owners and operators with the ability to have one-stop operations for maintenance and painting, said Pierson.

"You're talking about 13 million square feet of concrete, over 1.5 million square feet of hangar, office and warehouse space, including wide-body hangars," he said.

One major tenant is the Northrop Grumman Lake Charles Maintenance and Modification Center, which works on, among other airframes, the Joint STARS military surveillance aircraft for the Air Force at its 105,000 square-foot fabrication shop.

In addition, Landlocked Aviation Services has three hangars at Chennault and does painting work on wide and narrow-body aircraft.

In April the airport lost the AAR maintenance, repair and overhaul operation, but there's another MRO operation interested in taking over the facility, according to Randy Robb, executive director of Chennault International Airport. While he would not name the company, he said it will be even bigger than the AAR operation.

"Our job is to create jobs," said Robb, who anticipates the current 1,500 employment level at Chennault will rise to a little over 3,000 by the middle of next year.

Chennault has about 600 acres of prime property available for development. With rail on the eastern side of the airport and I-10 a short hop away, Chennault is developing as an intermodal complex. Among other projects, it's looking to attract refrigerated warehousing near the rails, as well as manufacturing and air cargo operations.

Chennault, in Foreign Trade Zone 87, has a direct, 9-mile link to the deepwater Port of Lake Charles.

The National Aircraft MRO Center of Excellence is nearby SOWELA Technical and Community College to support the ongoing demand for new hires and continuing education. The center trains about 130 aviation-related students every year.

Asked if there's been any effort or consideration to branding the Louisiana I-10 region's combined aerospace activities, Robb said they work with Lafayette and Michoud, but there's no specific effort at branding the Louisiana I-10 corridor.

"I don't know, but that's probably a brilliant idea."

Alexandria

Chennault was not the only former military air base in Louisiana to close and convert to commercial use.

"One huge aerospace asset that Louisiana offers, and that's perhaps a little

Alexandria International Airport. *LED photo*

under the radar, is England Airpark," said Pierson.

England Airpark is a 90-minute drive from I-10 via Interstate 49 in Alexandria, in the geographic center of Louisiana.

Once the site of England Air Force Base, the Airpark is a 3,000-acre industrial community that began developing in 1992 after the base closed. It's home to Alexandria International Airport and a mixed community that includes commercial developments and homes.

Because it connects via I-49 to I-10 in South Louisiana and I-20 in North Louisiana, Pierson sees it as a huge intermodal opportunity for industry, especially aerospace.

The site opened in 1942 as Alexandria Army Air Base, but was put on inactive status in 1946. It was reopened in 1950 during the Korean War and was closed at the end of the Cold War in 1992, a casualty of an early round of BRAC military base closures.

England Industrial Park and Community is a multimodal commerce center and community. It has the airport, office and warehouse facilities, golf course, hotel and restaurant, day-care center, and more than 300 units of housing and 1.5 million square feet of commercial space. The housing includes a retirement community and general housing. It has 60 businesses employing 2,000 people. It's run by England Authority (England Economic and Industrial Development District.), an independent political subdivision of the state.

Just this past September the England Authority received four grants totaling $17,867,492 from the Federal Aviation Administration. It's from the airport's involvement in the Airport Improvement Program's Military Airport Program, designed to help facilitate missions associated with the Joint Readiness Training Center at Fort Polk.

Grants will provide additional runway space, construction of new service roads, repaving existing runways, installing wildlife perimeter fencing and noise mitigation measures.

Twenty-five percent of the airport's travel is military-related, thanks to the 14,000-plus military and civilian jobs associated with Fort Polk and the Joint Readiness Training Center, to the west of Alexandria. It has moved thousands of military personnel and millions of pounds of cargo in support of wards in Iraq and Afghanistan. It has also been used in hurricane recovery efforts.

England has runways of 9,350 feet and 7,000 feet and 350,000 passengers per year. It has more than $144 million in annual aviation-related activity.

LED has worked with England Airpark to certify a 1,600-acre megasite that will be shovel-ready for a major industry to locate there.

"There will be advanced manufacturing -- we hope an aerospace prospect -- and whatever we're ultimately successful in landing there will be a significant player and a significant project for economic development along the Gulf Coast corridor," said Pierson.

Jon Grafton, executive director of England Airpark/Alexandria International Airport, said that of the 1,600 acres, 400 is "really a great piece of property for primary aircraft operations or an MRO" with access to the air field. The larger, 1,200 portion is seen as a good location for the automotive industry, but Grafton notes any of the acreage could be used by the aerospace industry. It's in Foreign Trade Zone 261.

Shreveport-Bossier City

Northwest Louisiana is home of Barksdale Air Force Base, headquarters

B-52H from Barksdale. *Air Force photo*

of the Global Strike Command, which oversees 67,000 personnel. It's responsible for the nation's three intercontinental ballistic missile wings, including B-52, B-1 and B-2 wings.

It's also home of the 8th Air Force and the 2nd Bomb Wing's three squadrons of B-52H bombers. The 11th Bomb Squadron is the training squadron, and the 20th Bomb Squadron and 96th Bomb Squadron are operational. Barksdale is also home to the Air Force Reserve Command's 307th Bomb Wing. The only other B-52 wing, the 5th Bomb Wing, is at Minot Air Force Base, N.D.

Shreveport's available 150,000-square-foot hangar complex is joined by a certificate- and degree-based Airframe & Powerplant (A&P) program at Southern University at Shreveport, which has an Aerospace Technology Program supported by LED's FastStart workforce program.

Louisiana has two public flight schools: Louisiana Tech University (Ruston, fixed wing aircraft) and South Louisiana Community College (New Iberia, rotorcraft), and in addition to the A&P school in Shreveport, there are also A&P schools in Lafayette, Baton Rouge and Lake Charles.

All things considered, Louisiana is a strong member of the four-state aerospace region with a variety of operations that make it a major player.

"Louisiana remains a competitive location with low overall tax burden, innovative workforce development training programs and attractive incentives," said Pierson, adding there's plenty of room to grow at locations across the state.

- David Tortorano

Corporate

UTC, Safran and the nacelles industry

When an area has two of the world's top suppliers of nacelle systems, it sends a message to others about the viability of its aviation activities...

Dignitaries attend the official dedication of the nacelles facility at UTC in Foley. *UTC photo*

In May 2016 United Technologies Aerospace Systems said it would expand its operation in Foley, and 15 months later it officially dedicated a new building to assemble nacelles, the housing around jetliner engines.

That's a big win for any area trying to grow its aerospace footprint. But there was more. Between the UTC announcement and the dedication, there was additional news that underscores the growing importance of the region's aerospace activities.

Safran Nacelles in November 2016 announced that it was expanding its international network of jet engine nacelle integration facilities with a new site in Mobile, Ala., to serve the Airbus U.S. manufacturing facility at the Mobile Aeroplex at Brookley.

UTC Aerospace

Already the largest manufacturing employer in Baldwin County, UTC Aerospace Systems in August officially dedicated its new 80,000-square foot nacelle assembly facility.

The new operation adds to the site's existing 230,000-square foot original equipment plant and 210,000-square foot MRO facility.

The expansion will give the Foley plant 1,000-plus workers. It's expected to be fully operational by year's end.

It features an automated material movement to index large nacelle component platforms down the assembly line, an overhead rail system with vacuum lifts and automated paint system.

A nacelle system is the aerodynamic structure that surrounds a jet engine, and includes the engine cowling, inlet cowl, fan cowl, thrust reverser, core cowl and exhaust system. Integration of the engine and nacelle is "podding."

Parts are shipped to Foley from locations worldwide, where they assemble the inlets and other parts. They are then mated with engines for the Mobile final assembly facility. The Foley site also assembles components for Boeing, Embraer and Bombardier.

Foley currently does the podding for the CFM and Pratt & Whitney engines used in the current engine option A320s built in Mobile, and will continue until Airbus starts building the more fuel-efficient A320neo.

After that, Foley will do pod work for Pratt & Whitney neo engines, the PW1000G, previously known as the Geared Turbofan. It's used in the Bombardier C Series, Mitsubishi Regional Jet (MRJ) and Embraer's second-generation E-Jets (E2). The engine is also an option on the Airbus A320neo and Irkut MC-21.

The integrated propulsion systems for the A320neo will be delivered to the Airbus final assembly line in Mobile, about an hour away from the Foley site.

Alabama Gov. Kay Ivey recently toured the new facility at the plant, which in February was named one of *IndustryWeek* magazine's 2016 Best Plants in North America.

"The Foley expansion is part of an incremental investment of more than $500 million that Aerostructures has made to build or expand six company sites around the world in support of the A320neo nacelle ramp-up," said Marc Duvall, president of Aerostructures, UTC Aerospace Systems.

The UTC Aerostructures business received the Airbus Supplier Support Rating for exceptional aftermarket support of airplanes at the Paris Air show earlier this year.

Safran Nacelles

Safran's site in Mobile will perform the podding for the LEAP-1A engines, one of the two engine options for the Airbus A320neo jetliners. The LEAP-

1A was developed by Safran Aircraft Engines and GE through their joint company, CFM International, to power the next generation of single-aisle commercial jets.

The podding work involves integrating the turbofan power plants with Safran Nacelles-supplied nacelle systems, followed by delivery of the completed units to Airbus, about a mile away, for installation on A320neo aircraft when the customer picks the CFM option.

Safran signed a 20-year lease for the existing building. The plant will be open before the end of the year, and delivery of integrated power plants to Airbus will begin in early 2018.

Safran Nacelles' Mobile location will utilize innovations developed for LEAP-1A at nacelle/engine integration sites in Toulouse/Colomiers, France, Hamburg/Finkenwerder, Germany and Komsomolsk, Russia. The innovations include specially designed Smart-Trolley engine cradle and transporter, which reduces the time to handle integration work.

The Safran Nacelles operation is in a refurbished building in Mobile. *Safran illustration*

In a news release in August 2017, two months after the Paris Air Show where final details were worked out, the Mobile Area Chamber of Commerce said that Safran would hire 20 workers over the next three years for the new operation.

The Mobile Airport Authority is building out one of the existing bays at Mobile Aeroplex to 24,500 square feet. In addition, the company is investing about $1 million in equipment with an opening planned for November 2017.

- David Tortorano

Related news

- UTC in September said it would acquire Rockwell Collins for a total transaction value of $30 billion, including Rockwell Collins' net debt.

Boeing in a statement warned that it would turn to regulators for help if the combination threatened competition in parts manufacturing, according to the *New York Times*.

And Airbus, which has experienced delays because of problems with the latest batch of Pratt & Whitney jet engines, said it hoped the deal "would not distract UTC from their top operational priority."

The deal comes on the heels of Rockwell Collins $8.3 billion takeover of B/E Aerospace, a manufacturer of seats and other interior plane parts.

- Airbus told European governments Oct. 4 that it decided to bring the design of some nacelles inside the company, rather than leaving it with suppliers, according to *Reuters*.

An Airbus spokesman said the decision had already been taken to recoup nacelle work carried out by United Technologies for engines supplied by the company's Pratt & Whitney to power the A320neo.

"Bringing nacelle capability in-house allows Airbus to further improve nacelle aerodynamics to offer extra efficiency and better performance," the Airbus spokesman said.

Under the project, industry sources say Airbus will redesign some key parts including the P&W engine's thrust reverser. It will also be responsible for integrating the engine housing and the pylon which attaches it to the wing, according to *Reuters*.

- Tulsa-based NORDAM announced an agreement with Airbus to supply engine build-up system for A320neos equipped with Pratt & Whitney PW1100G engine. The company's Nacelle and Thrust Reverser Systems Division has delivered integrated power-plant design for business jet customers, but this will be the first for a commercial aircraft.

The buildup system integrates the engine to the aircraft by a series of electrical, hydraulic, pneumatic, fire-detection and bleed-air systems. NORDAM will design, integrate and deliver the specified combination of wires, ducts, brackets, anti-ice valve, tubing and more for delivery to Airbus final assembly lines in Toulouse, France; Hamburg, Germany; Tianjin, China; and Mobile.

- Turkish Aerospace Industries (TAI) said in early October that it has been awarded the contract to design, build and supply the P&W nacelle fan cowl for the A320neo.

The fan cowls will be designed and built at the TAI Ankara Kahramankazan premises in Turkey, where it is already contracted to design and build parts for other Airbus aircraft.

- Magellan Aerospace Corp., based in Toronto, Canada, has been selected by Airbus to provide exhaust systems for the A320neo family of aircraft.

Magellan will design, develop, and manufacture exhaust systems for the P&W nacelle, with the first unit scheduled to enter service in 2022.

The systems will be produced in Winnipeg and Manitoba, Canada, and Middletown, Ohio and delivered directly to Airbus assembly lines across the globe.

- compiled by GCAC

Analysis

What you might have missed

About 550 people turned out in early October for the 21st Gulf Power Economic Symposium at the Sandestin Golf and Beach Resort in Miramar Beach, Fla.

I go every year even though it does not focus on aerospace. But the symposium brings up issues that ultimately have an impact on the growth of the aerospace corridor.

Stan Connally, chairman, president and CEO of Gulf Power, said in his opening remarks that "we can create a future for 2030 now."

That involves, among other things, addressing pressing issues like poverty and education, and working together on solutions.

"The economic prosperity of this region, it can't just happen in one community, it can't just happen in one county," he said.

Indeed, regionalism is a drum I've been beating for quite some time. And so is workforce development.

Go to just about any gathering about the economy and the common theme is education. It's not only a ticket out of poverty, but it's something valued by every company - those here and those we want to attract.

The importance was brought home in a talk by Peter Zeihan, a geopolitical strategist and author of *The Accidental Superpower* and *The Absent Superpower*.

Using a wealth of data, he points out that no country has benefited more from its geographic and demographic features than the United States. It will continue to be the place where the world invests. The takeaway for me? Northwest Florida, and the entire aerospace region, should make itself as appealing as possible for the rest of the world for these future investments.

In another gathering in late August, this one in Fort Walton Beach, Fla., the message was that there are ample opportunities for businesses big and small to work with other companies and the military. And the market is good right now.

David Tortorano

The first TeCMEN Industry Day attracted 287 participants and 44 exhibitors, and it was successful enough that it's likely to be held again next year, said Linda Sumblin, manager of TeCMEN.

Held at the Emerald Coast Convention Center, it was presented by the Technology Coast Manufacturing and Engineering Network (TeCMEN), the Economic Development Council of Okaloosa County, and Okaloosa County.

"Our objective was to create a meaningful forum for the region's aerospace, defense, manufacturing, and technology businesses to learn, share and network – both with one another and with key educational partners," said Sumblin.

"I was impressed with the professionalism and the level of interest in networking and bringing together a variety of companies," said John DiGiacomo of the Small Business Development Center of Florida.

"Everyone I talked to was eager to develop new relations with the prime contractors, their peers and even their competition," he said.

"I think overall, the information flow was truly amazing in that we were able to provide insight regarding a variety of different topics," said Maynard Factor, TeCMEN chairman and director of business development with Micro Systems of Fort Walton Beach.

"My takeaway was that, as a whole, the defense market appears to be positive. We discussed topics that included the increased defense budget, current global threats, and aging equipment which are all hot topics for many defense related organizations in this area," said Factor.

Products developed for the military often have commercial applications. Factor's company is part of Kratos, which recently leveraged technology it developed for the military and turned it into a commercial product.

"We adapted our vehicle automation kit called the Multi-Platform Applique Kit (M-PAK) to automate a road construction vehicle called the Autonomous Impact Protection Vehicle (AIPV)," Factor said

The driverless truck, designed as a mobile crash barrier to absorb the impact of errant vehicles to protect road crews, was used on a public road in Colorado in August. It's also being tested in the United Kingdom.

Solar power

Officials marked the completion of the three largest combined solar facilities on Defense Department property in August with the ceremonial flipping of the switch.

Executives of Gulf Power, Coronal Energy, the Air Force and Navy were on hand at Naval Air Station Pensacola's Naval Outlying Landing Field Saufley for the event.

Ground was broken in November 2016 for the project that spans 940 acres across three Navy and Air Force sites in Northwest Florida. Saufley's solar array site is a 50 megawatt solar-generating facility.

The other two sites are at Naval Air Station Whiting Field's Outlying Landing Field Holley, which is a 40 megawatt solar generating facility, and Eglin Air Force Base, which has a solar generating facility of 30 megawatts.

Combined the three sites have about 1.5 million solar panels capable of gen-

erating up to 120 megawatts of electricity, enough energy to power nearly 18,000 homes annually. The project became operational earlier this summer. Gulf Power will buy all electricity generated from the sites from Coronal Energy and push it to the energy grid.

AC-130J

One of the most unique assets in this region is the gunship of Air Force Special Operations at Hurlburt Field, Fla. And the latest version of the modified C-130, designated the AC-130J "Ghostrider," will be declared combat operational this year.

But it won't deploy to a war zone for a couple of more years, according to Lt. Gen. Marshall "Brad" Webb, head of Air Force Special Operations Command at Hurlburt. The delay is because of the high pace of operational missions abroad, which makes it harder to train special operators on the new gunship's weapons system.

The AC-130J used for close-air support is armed with a 30mm cannon and a suite of precision-guided munitions that include the GBU-39 Small Diameter Bomb and AGM-176 Griffin missile. It also has a 105mm M102 howitzer system, which can fire 10 50-pound shells a minute.

As of April 2017, AFSOC was exploring the possibility of a directed-energy laser system designed to knock out enemy electronics and disable critical infrastructure.

Northrop/Orbital ATK

Northrop Grumman said in September that it's acquiring space-focused Orbital ATK for about $7.8 billion, a deal that will give Northrop a major role in space and missiles. Orbital, based in Dulles, Va., makes rocket motors and designs and produces launch vehicles.

The deal comes as the Pentagon increasingly looks at space as a potential battle front. Orbital and ATK merged in 2014.

Northrop Grumman is a major defense player in the region. Orbital's Antares had been powered by Aerojet AJ-26 engines it tested at Stennis Space Center, but it dropped the engine after an explosion in 2014.

Airbus

In September the Airbus U.S. Manufacturing Facility in Mobile, Ala. reached a milestone when it received the 50th shipment of major component assemblies just two years after taking delivery of the first shipset.

The components will eventually become the 50th Airbus aircraft produced in the U.S., this one for Delta Airlines. A shipset includes front and aft fuselage sections, a vertical and horizontal tailplane, and wings. The components are made in various facilities around Europe using parts and systems from around the world.

They are brought together and shipped from Hamburg, Germany, to the Port of Mobile and transported by road to the Airbus U.S. Manufacturing Facility. Since production began in 2015, Airbus has delivered aircraft from Mobile to four customers: American Airlines, Delta Air Lines, JetBlue and Spirit.

Also in September, Airbus said the number of in-service Airbus commercial aircraft in North America reached a new high of 1,500 following the delivery of an A321 to American Airlines.

A celebration was held at the Airbus U.S. Manufacturing Facility in Mobile with delivery teams from American Airlines and Airbus marking the milestone.

Space

After a series of tests on the RS-25 engine flight controller, NASA and Stennis Space Center, Miss., are planning a public test of the engine during an open house Oct. 19.

At the end of August NASA closed a summer of successful hot fire tests of the flight controller, the "brain" of RS-25 engine. on the A-1 Test Stand. The test involved installing the controller on an RS-25 development engine and firing it in the same manner, and for the same length of time, as needed during an actual SLS launch.

The tests are being done as NASA gets ready for Exploration Mission-1, which will be an uncrewed mission into lunar orbit, designed to provide a final check-out test of rocket and Orion capabilities before astronauts are returned to deep space.

The SLS rocket will be powered by four RS-25 engines, providing a combined 2 million pounds of thrust, and with a pair of solid rocket boosters, supplying more than 8 million pounds of total thrust.

That mission will be followed by EM -2, which will transport a crew of astronauts aboard the Orion Multi-Purpose Crew Vehicle.

Meanwhile, a full-scale model of a Space Launch System core stage was recently completed at a plant in North Alabama and is now at NASA's Michoud Assembly Facility in east New Orleans.

The steel article was assembled at G&G Steel's facility in Cordova, Ala. Radiance Technologies and Dynetics were contracted by NASA to build the Pathfinder, and G&G Steel performed the final welding and assembly.

It was delivered by barge.

NASA will use the Pathfinder at MAF, the Stennis Space Center, Miss., and Kennedy Space Center, Fla., to practice handling a fully assembled SLS Core Stage, including transportation, before they have to start doing it with the real thing as early as next year.

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***Page 1 mast**: The first A320 built at the Mobile Aeroplex takes its maiden flight. It was later delivered to Spirit Airlines.. Airbus photo*