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Inside This Issue

GE's TWO NEW GENAV ENGINE PROGRAMS SET TO SOAR

GE Aviation is preparing for the first engine run of its Advanced Turboprop (ATP) engine, which was launched as a clean-sheet design in 2015. The first such design to hit the turboprop market in more than three decades, it was chosen to power Cessna's new single-engine Denali.

According to Brad Mottier, vice president and general manager of GE's business and general aviation and integrated systems organization, approximately 85% of the parts, including those manufactured through additive technology, have been delivered to the company's facility in Prague, where the powerplant is being assembled in anticipation of run testing by year-end.

"If you think about this, it's two years from when we launched the program, and we are running the first conforming complete engine," Mottier said at NBAA '17.

"That is an unbelievably fast program, it's the fastest that we've ever done at GE, and I would say it's probably the fastest at other engine manufacturers." Currently, the company's engineers are conducting axial-centrifugal compressor vehicle tests at its European Technology Center in Munich. The ACCV consists of the ATP's stator, rotor and cold section assemblies, and the tests will validate its efficiency, performance and operability. "Our engineering group is optimistic that the performance numbers we quoted for ATP will be met or exceeded," Mottier noted. The company expects it will be able to migrate the new technologies that it is using on the ATP, such as extensive use of additive manufacturing, to other platforms such as the smaller H-series turboprop engines.

The engine-makers other new program, the Passport turbofan, is sharing the spotlight at the show, with the debut of the Bombardier Global 7000. The 18,920-pound-thrust engine, which received FAA certification last year, has accumulated more than 3,300 hours, with 3,385 endurance cycles as of the latest count. Mottier revealed than an incident occurred earlier this summer in the Global 7000 flight-test program, which required an engine to be shut down in flight, was due to an isolated assembly error on the powerplant. He said the company is now in the process of preparing for full-scale production, with the ultra-long-range twinjet's entry into service expected in the second half of 2018.

With the advanced sensor capabilities installed in both of the new engines, GE plans to bring the same OnPoint diagnostic technologies to bear as on its newest commercial engines. Mottier told the audience that each of the engines will have a 'digital twin' computer model from the time it is assembled and tested, and that virtual engine will fly every mission as its real-life self serial number counterpart, under the same conditions.

"We know based on where you are flying what the weather was that day, what you d-rate was, did you fly through any volcanic ash, were you in the Middle East flying through a dust storm?" Mottier explained, adding the procedure is allowing the company to move away from broad Service Bulletins and tighten its focus on potential problems with specific engines based on use. "We monitor each engine individually, and we can go and do prescriptive maintenance," said Mottier. "I think that is going to be a game changer for maintenance. *Source: AIN Online, Curt Epstein*

CANADA'S BOMBARDIER COULD DODGE 300 PERCENT TARIFF BY BUILDING IN ALABAMA

Canadian jet-maker Bombardier announced Monday that it is selling a controlling stake in its 100-150-seat C-series jetliner to European manufacturer Airbus, just weeks after the U.S. Commerce Department moved to impose 300% tariffs on the plane. The companies also said they will expand the plane's production to a new facility in Mobile, AL, a move that could help it avoid the import duty. Executives from Airbus and Bombardier touted the deal's job-creation potential. "This is a win-win for everybody," Airbus chief executive Tom Enders said in a statement. "Not only will this partnership secure the C Series and its industrial operations in Canada, the U.K. and China, but we also bring new jobs to the U.S."

The deal included no up-front cash payment, a possible reflection of the plane's enormous production costs. When the deal closes, Airbus will own just over half of the C-series plane, Bombardier will own 31% and a Canadian state investment agency will own the remaining 19%. The combination significantly complicates what had been a three-way trade dispute between the United States, Canada and Britain. With Airbus' ownership of the C-series aircraft, the dispute now touches France, Germany and Spain, where Airbus has a significant presence.

The dispute started in May when Chicago-based aerospace manufacturer Boeing asked the U.S. Commerce to investigate allegations that Bombardier is selling the C-series plane in the United States at an unfairly-low price and doing so with the help of illegal government subsidies. Bombardier had earlier struck a deal to sell 75 C series CS100 jets to Atlanta-based Delta Airlines.

In two separate rulings over the past few weeks, the U.S. Commerce Department ruled in Boeing's favor on both counts, imposing a preliminary 300% tariff on Bombardier planes. The International Trade Commission, a quasi-judicial U.S. agency that has the final say in such disputes, is expected to issue a final decision on the matter in February.

Bombardier and Airbus started discussing a potential sale in August, three months after Boeing first filed its tariff petition with the Commerce Department, and Airbus executive said Monday. "We've been extremely fast compared to other programs at Airbus," Airbus chief executive Tom Enders said. In its published reactions to Airbus and Bombardier's combination, Boeing sought to cast the deal as a blatant attempt to circumvent U.S. trade law.

"This looks like a questionable deal between two heavily state-subsidized competitors to skirt the recent findings on the U.S. government," a Boeing spokesman said in a statement. "Our position remains that everyone should play by the same rules for free and fair trade to work." In an evening call with reporters, executives from Airbus and Bombardier insisted the deal was motivated by a strategic business consideration and not a desire to avoid the tariff. Still, they recognized the added benefit of potentially avoiding the duty.

"It's not intended to circumvent anything, but the fact is that when you produce an aircraft in the U.S. it's not subject import tariff rules," Bombardier President Alain Bellemare said. Trade experts question whether using an Alabama production facility would necessarily allow Airbus to waive the tariffs on the C-series plane. Much of the work of producing the plane comes down to assembly, with the actual components stretched across a global supply chain. "There is a legal question of how much of the parts and components and value-added needs to actually happen in the U.S. for tariffs to no longer apply," said Chad Brown, a senior fellow with Peterson Institute for International Economics. "You can't just fly an airplane to Alabama and say it's made in America."

But the combination could also give Bombardier new political clout in the United States, possibly making the import tax politically difficult for the White House. Airbus already operates a 53-acre facility in Mobile where it has produced the A320 narrow-body commercial jetliner since 2015-the company's first U.S. production facility. As part of the announcement, Airbus said it will set up a second production center in Mobile, a move that could shift some of the plane's future job creation potential from Quebec to the United States. That could give the C-series another ally in Congress, where the tariff already faces resistance. In an October letter to the International Trade commission a bipartisan group of four U.S. senators and three House members said they oppose the border tax.

"This destroys the trade complaint and guarantees the success of the C-series aircraft in the U.S.," said Richard Aboulafia, and aerospace analyst with Teal Group. Others said it is unlikely that Bombardier chose to embark on a combination purely because of the Commerce Department's tariff decision. "When a partner in a venture pays nothing to get on board, it means you were in trouble to begin with," said Loren Thompson, an aerospace consultant whose think-tank gets some funding from Boeing. *Source: The Washington Post, Aaron Gregg*

BASE METALS WINNER AND LOSERS IN 2017

Half of the base metals trading on the London Metal Exchange hit multiyear highs in 2017, a year that has seen year-to-date increases for some over 27%. Copper to date is up 27.4%, Aluminum is up 26%, Nickel is up 11.5%, Zinc is up 24.4%, and Lead is up 25.9% for the year. Tin has dropped 2.3% since the start of the year. *Source: AMM.com*

HONEYWELL GETS FAA NOD FOR LONGITUTE'S HTF7700L ENGINE

The Honeywell HTF7700L turbofan that powers the Cessna Citation Longitude has received FAA approval, the Phoenix-based avionics and aircraft engine manufacturer announced today. This certification marks the sixth application of the HTF7000 family, variants of which are already in service on the Bombardier Challenger 300 and 350, Gulfstream G280 and Embraer Legacy 450 and 500. Cessna's Longitude is expected to enter service early next year.

To date, the Honeywell Aerospace HTF7000 family has logged more than 3.5 million flight hours, and is fast approaching the 2,000th production engine delivery in 2018, some 14 years after its first entry into service. According to Honeywell, the HTF7000 family is designed for on-condition maintenance, has line replaceable components that can be removed and replaced using common hand tools and is designed to be environmentally friendly.

"Honeywell's HTF7000 family continues to lead the way in performance, reliability and cost of ownership as it continues to expand its presence across business aviation," said Honeywell Aerospace Engines and Power Systems president Brian Sill. "The HTF7700L engine certification for the Citation Longitude aircraft marks another successful milestone for the HTF7000 family, adding to its growing heritage." *Source: AIN Online, Chad Trautvetter*

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Surcharge Totals Aug 2017-Jan 2018

Grades	Aug	Sep	Oct	Nov	Dec	Jan
15-5	0.3811	0.4123	0.4906	0.4642	*	*
15-7	0.4740	0.5387	0.6427	0.6040	*	*
17-4	0.3822	0.4118	0.4911	0.4665	*	*
17-7	0.4142	0.4599	0.5685	0.5304	*	*
201	0.3716	0.4015	0.4882	0.4618	*	*
301 7.0%	0.4116	0.4561	0.5644	0.5270	*	*
302/304/304L	0.4446	0.4948	0.6136	0.5731	*	*
304-8.5%	0.4571	0.5103	0.6326	0.5904	*	*
305	0.5488	0.6224	0.7711	0.7176	*	*
309	0.5767	0.6502	0.8111	0.7581	*	*
310	0.7681	0.8823	1.0993	1.0237	*	*
316/316L	0.5777	0.6627	0.7982	0.7485	*	*
316LS/316LVM	0.8200	0.9800	1.0400	*	*	*
317L	0.6683	0.7703	0.9246	0.8707	*	*
321	0.4613	0.5175	0.6399	0.5960	*	*
347	0.7288	0.7850	0.9074	0.8636	*	*
409/409 Mod	0.1861	0.1900	0.2274	0.2119	*	*
410/410S	0.1923	0.1962	0.2362	0.2207	*	*
430	0.2282	0.2319	0.2876	0.2729	*	*
434	0.2653	0.2776	0.3369	0.3213	*	*
439	0.2358	0.2394	0.2986	0.2842	*	*
440A	0.2282	0.2319	0.2876	0.2729	*	*
2205	0.5622	0.6308	0.7588	0.7249	*	*
263	6.5417	6.3011	6.4416	6.9385	7.2440	7.3977
276	3.5368	3.2610	2.9147	3.0924	3.7369	4.0000
A286	0.9355	0.8605	0.7448	0.8173	1.0129	1.1153
330	1.1241	1.0275	0.8905	0.9940	1.2534	1.3875
400	1.8568	1.6642	1.6041	1.8355	2.3819	2.5286
455	0.5000	0.6000	0.6200	*	*	*
465	0.5700	0.6900	0.7300	*	*	*
600	2.0593	1.8577	1.6881	1.9040	2.4417	2.6449
601	1.8962	1.7311	1.5343	1.7112	2.1522	2.3569
617	5.0335	4.7794	4.6961	5.0551	5.5215	5.7249
625	4.1002	3.8758	3.5821	3.7601	4.3039	4.5371
718	4.0784	3.9151	3.7080	3.8595	4.2751	4.4623
X-750	2.6288	2.4328	2.2612	2.4711	2.9940	3.1960
825	1.6064	1.4758	1.2810	1.3987	1.7295	1.8948
HX	2.3634	2.1712	1.9096	2.0604	2.5118	2.7158
188	12.5300	13.1500	13.6100	*	*	*
CCM	21.9800	21.7900	22.2000	*	*	*
L-605	15.5700	16.1600	16.6200	*	*	*

*Surcharge currently not available

STEEL IS BACK IN STYLE WITH CAR MAKERS

Automakers are rediscovering steel. Varieties of lighter, stronger steel are being used in Fiat Chrysler Automobiles N.V.'s Pacifica van, Honda Motor Co.'s Ridgeline pickup truck, and General Motors Co.'s Chevrolet Malibu sedan. Audi, which switched to an all-aluminum body for its A8 sedan more than 20 years ago, is using steel again on the latest model. "It's the strongest and most rigid A8 we've built," said Audi spokesman Mark Clothier.

Steel has always been cheaper and stronger than aluminum. But conventional steel is heavy. Many car makers seeking to comply with tougher fuel economy requirements have shifted in recent years to aluminum and other light materials like carbon fiber. Now, steel makers have figured out how to make steel lighter without compromising its strength or versatility. "Everything is moving to thinner and lighter," said Mark Bula, chief commercial officer at Big River Steel, a mill that opened in Arkansas last year. "The steel industry is moving that way as well."

On next year's Audi A8, steel will make up 40% of the metal in the passenger-compartment frame, up from 8% eight years ago. By 2025, the amount of lightweight, high-strength steel in a car or light truck in North America is projected to rise to an average 483 pounds, 76% above the 2015 average, according to industry consultancy Ducker Worldwide.

ArcelorMittal N.V. expects auto makers' global demand for press-hardened steel sheet, which is strong and malleable for complex stamped parts, to grow 36% by 2020 to 3.7 million metric tons. The company, the world's largest steel maker, began producing super-strong steel at its mill in Calver, Alabama this year. And it plans to open a plant in Detroit late this year—the third of its kind in the U.S.— to weld and heat-treat multiple pieces of lightweight steel of varying strength grades and thicknesses into a single sheet.

Sheets from these plants are stamped into large components, such as door frames, that feature some sections with extra-strong steel and others with steel that has less strength but is easier to bend. The 2017 Chrysler Pacifica's two front-door frames are each made of five pieces of steel with three different thicknesses. The door frames shaved 22 pounds off the vehicle, Fiat Chrysler said.

Aluminum remains in wide use with auto manufacturers looking to reduce a vehicle weight. Even as lighter steel gains popularity, aluminum is expected to continue replacing heavier-steel varieties. Aluminum content in cars and light trucks in North America is expected to reach an average of 520 pounds in 2025, a 31% increase from 2015, according to Ducker Worldwide. More than two-thirds of closure components, such as hoods and trunk lids on light vehicles are expected to be aluminum by 2020, double from 2016.

"High-strength steel has some inherent properties that are tough to escape from, It's three times heavier than aluminum," said Sven Richard Brandtzaeg, chief executive of Norwegian aluminum producer Norsk Hydro AS A. Aluminum's penetration into the auto industry is experiencing some growing pains. Auto makers in Japan are scrambling to check the safety of their aluminum components after one of Japan's biggest aluminum suppliers, Kobe Steel Ltd., disclosed that quality-control paperwork for auto customers had been doctored.

Still, steel remains cheaper than aluminum. To maintain that edge, analysts say steel companies have refrained from maximizing profits on the new high-strength steel grades as they work to draw customers back from aluminum. North Carolina-based Nucor Corp., whose electric furnaces were once derided as insufficient for making automotive-grade steel, now sells nearly a fifth of its annual production volume to auto makers. Executive John Ferriola, "In the battle against aluminum, steel is going to come out very well." *Source: The Wall street Journal, Bob Tita, Chester Dawson*

Look for UPM at FABTECH. Visit Booth #C41738 in Chicago beginning November 6th.

POWER-GEN International rounds out the year December 5th with UPM in Booth #9307.