September, 2021



AN ONI COMPANY

The UPM Market Informer



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German Startup Isar Aerospace Signs First Launch Contract

Isar Aerospace, one of three German startups vying for ESA funding for small sat launchers they each aim to debut next year, has won its first launch contract. Airbus Defense and Space plans to launch a future Earth observation satellite on Isar Aerospace's Spectrum rocket, a two-stage rocket designed to deliver up to 700 kilograms of payload to sun-synchronous orbit. The contract announced April 22 includes options for additional Spectrum launches but does not specify a timeline for the one firm mission.

Isar Aerospace aims to conduct Spectrum's maiden launch in 2022. Founded in 2018, the Munich-based company recently arranged for exclusive use of one of two launch pads at Norway's Andøya Space Center, which is currently under construction. The 20-year lease will enable Isar Aerospace to deploy payloads into sun synchronous and polar orbits.

Airbus Defense and Space is currently working on at least two Earth observation constellations destined for sun-synchronous orbits. One of those, Pléiades Neo, will consist of four 750-kilogram satellites, the first of which is slated to launch April 29 on an Arianespace-operated Vega rocket along with five smaller payloads. Airbus plans to use Vega and Avio's upcoming Vega C to launch the other three Pléiades Neo satellites, which are all too heavy for Spectrum's advertised 700-kilogram to SSO capacity.

The Composante Optique 3D (CO3D) constellation, a joint undertaking by Airbus and the French space agency CNES, looks like a better fit for Isar Aerospace's rocket. Although the initial four-satellite CO3D constellation is slated to be launched aboard a Vega C in 2023, Airbus anticipates that the constellation could grow to between 12 and 24 satellites. At 300 kilograms each, these satellites would be well within Spectrum's projected capabilities to launch two at a time.

Isar Aerospace is one of three German launch startups currently developing small rockets with an eye toward winning European Space Agency support. Along with Rocket Factory Augsburg and HyImpulse Technologies, the three startups are competing as part of the German Space Agency DLR's micro launcher competition. The competition, which is being run in conjunction with ESA, will award one of the three startups with 11 million euros (\$13 million) in funding later this year. The funding is to be used to support a qualification flight that will carry a payload for a university or research institution for free. A second prize of 11 million euros in funding will then be awarded in 2022 as the final stage of the competition. <u>More on this story</u> *Source: Andrew Parsonson, Space News, Photo from Isar Aerospace*

Surcharge Totals June - November 2021



	June	July	Aug	Sept	Oct	Nov
15-5	0.7702	0.7951	0.8233	0.8464	*	*
15-7	1.0386	1.1805	1.2887	1.3212	*	*
17-4	0.7650	0.7886	0.8133	0.8344	*	*
17-7	0.9147	0.9459	0.9949	1.0341	*	*
201	0.7451	0.7749	0.8189	0.8613	*	*
301 7.0%	0.9048	0.9356	0.9838	1.0221	*	*
302/304/304L	0.9862	1.0180	1.0699	1.1129	*	*
304-8.5%	1.0206	1.0530	1.1068	1.1521	*	*
305	1.2673	1.3042	1.3709	1.4330	*	*
309	1.3115	1.3475	1.4139	1.4760	*	*
310	1.8179	1.8625	1.9547	2.0500	*	*
316/316L	1.3043	1.4502	1.5713	1.6204	*	*
316LS/316LVM	1.7600	1.9600	2.0900	*	*	
317L	1.5014	1.7036	1.8590	1.9111	*	*
321	1.0451	1.0785	1.1324	1.1812	*	*
347	1.3509	1.3841	1.4396	1.4874	*	*
409/409 Mod	0.3471	0.3705	0.3918	0.3977	*	*
410/410S	0.3542	0.3774	0.4001	0.4051	*	*
430	0.4111	0.4330	0.4553	0.4603	*	*
434	0.4883	0.5519	0.5974	0.6011	*	*
439	0.4276	0.4493	0.4692	0.4756	*	*
440A	0.4111	0.4330	0.4553	0.4603	*	*
2205	1.1634	1.3576	1.4921	1.5199	*	*
263	7.9946	8.2475	7.7472	7.8493	8.3874	9.2311
276	7.1199	6.5237	6.4275	7.1446	8.2827	8.6095
A286	2.2187	2.0210	2.0153	2.1878	2.3119	2.4466
330	5.4791	2.5437	2.5474	2.7587	2.8333	3.0213
400	5.4791	4.8402	4.8974	5.4125	5.4418	5.7343
Custom 455	0.9900	1.0300	1.1000	*	*	*
Custom 465	1.2900	1.3900	1.4700	*	*	*
600	5.6497	4.8973	4.9049	5.3459	5.5073	5.8693
601	4.8061	4.2425	4.2486	4.6100		5.0591
617	7.5248	7.3395	7.0459	7.4162	8.1455	8.7649
625	7.4154	6.8490	6.8007	7.3522	8.1255	8.4406
Custom 630	0.8700	0.9100	0.9600	*	*	*
718	6.9441	6.4667	6.4511	6.8313	7.2706	7.5349
X-750	6.1830	5.4539	5.4597	5.8895	6.1457	6.4914
825	3.6277	3.2981	3.2836	3.5974	3.8829	4.0880
НХ	4.8964	4.4855	4.4236	4.8922	5.5163	5.7905
188	9.4100	9.7900	11.7800	*	*	*
CCM	12.5100	13.4400	17.5200	*	*	*
L-605	10.6400	11.0500	13.4200	*	*	*

*Surcharge currently not available



Rolls-Royce Delivers 100th Pearl 15 Engine to Bombardier

The engine, developed and built in Dahlewitz near Berlin, Germany, is the first member of the Pearl engine family and the exclusive option for Bombardier's latest business jets, the Global 5500 and Global 6500.

Nuno Taborda, senior vice president production programs, Rolls-Royce Deutschland, said: "This engine delivery milestone is important for us – demonstrating the program's maturity and confirming our confidence in the potential of the Pearl family.

"I would like to thank everyone at Bombardier for their continued close teamwork with us to make this aircraft and engine such a great success." Paul Sislian, executive vice president, operations and operational excellence, Bombardier, added: "Thank you to the dedicated teams at Rolls-Royce for their innovation and commitment to excellence. This milestone delivery signals the success of the Global 5500 and Global 6500 business jets since their entry into service, and the Pearl 15 engine contributes to providing our customers with an outstanding flight experience and a smooth ride."

The Dahlewitz site, which has delivered more than 1,800 engines overall to Bombardier to date, started production in June 1995 and now employs approximately 2,500 people. As Rolls-Royce's center of excellence for business aviation engines, the site has an important role in its global manufacturing and development footprint. In addition to the Pearl family, the BR710 and BR725 business jet engines are also assembled at the facility.

Dahlewitz is also home to the development and testing of Rolls-Royce's new power gearbox for the UltraFan demonstrator. This demonstrator is the basis for a potential new family of UltraFan engines, which will be able to power both narrowbody and widebody aircraft and deliver a 25% fuel efficiency improvement compared to the first generation of Trent engine. *Source Michael Tyrrell, Aerospace Manufacturing*

FDA Clears Zimmer Biomet's Rosa Hip Personized Robotic System

Zimmer Biomet (NYSE:ZBH) today announced that it received FDA 510(k) clearance for its Rosa Hip system for robotically-assisted surgery. Warsaw, Ind.-based Zimmer Biomet designed the Rosa Hip personalized robotic system for direct anterior total hip replacement. It is the company's fourth robotic system and adds to its Rosa robotic portfolio of orthopedic devices, which includes Rosa Knee, Rosa Partial Knee and Rosa One.



"We're excited to announce the FDA clearance of Rosa Hip, and to now offer one of the most comprehensive orthopedic robotic solutions through a single, multiple application platforms," chief operating officer Ivan Tornos said in a news release. "As an integrated component of our ZBEdge Connected Intelligence Suite, Rosa Hip advances our vision to translate pre-, intra-and post-operative data into actionable clinical insights to inform personalized care decisions."

Rosa Hip is designed to assist direct anterior surgeons with preparation, positioning and component impaction while also intraoperatively quantifying cup orientation, leg length and offset. Zimmer Biomet's Rosa Hip system is compatible with a number of implant systems, including the Avenir Complete hip system. It uses fluoroscopy and provides robotic assistance to guide accurate acetabular component orientation and intra-operative assessment of leg length and offset.

"Rosa Hip will allow surgeons to retain complete control over case planning and execution while providing real-time data and visualization tools," Atul Kamath, director for the Center for Hip Preservation at the Cleveland Clinic, said. "Even surgeons who are new to robotic-assisted surgery can easily tailor Rosa Hip to adapt to their own workflow. The robotic platform provides support during component positioning, cup impaction and other critical steps of an anterior approach total hip replacement. By reducing the intra-operative variability and inconsistency, this new technology has the potential to give surgeons and their patients greater confidence in seeking value in contemporary total hip replacement." More on the story Source: Danielle Kirsh, Mass Device



Solar Could Provide 40% of U.S. Power Generation by 2035, Biden Administration Says

The Department of Energy is projecting that solar power could comprise up to 40 percent of U.S. power generation nationwide by 2035, an increase of more than tenfold from today, with better incentives for renewable energy.

In a memo released Tuesday, department officials cite a pre-publication study from the National Renewable Energy Laboratory indicating that solar energy would need to grow at a 300 to 400 percent rate to reach this point. With this

level of acceleration, the memo states, solar generation could increase from 3 percent now to more than 40 percent over the next 14 years.

The memo identifies a number of strategies officials say could advance this goal, including clean energy tax credits, investment in the grid and transmission lines and increased deployment to low-income communities.

"Meeting these goals will require billions in investment and market opportunities through 2050 across clean energy generation, energy storage, electricity delivery, and operations and maintenance — including in low-income and community solar," the memo states. "Investments that lower both the hardware and soft administrative costs of solar will save consumers thousands of dollars on their residential systems and help lower their utility bills."

The memo comes the week after the Senate passed a \$1 trillion infrastructure plan that includes steps to modernize the grid. In the meantime, the White House has pledged to take further steps to incentivize renewable and solar energy. A separate \$3.5 trillion reconciliation package would allocate \$198 billion under the Committee on Energy and Natural Resources but does not specify individual uses.

Separately, the Biden administration is pushing for an extension of a 26 percent tax credit, for which solar energy projects are currently eligible. White House climate adviser <u>Gina McCarthy</u> said in July that if a clean energy standard was not passed in either the infrastructure or reconciliation package, "we have lots of regulatory authority that we intend to use, regardless, and we'll move forward with those efforts to try to tackle the climate crisis." *Source: Zack Budryk, The Hill*



Foxconn Will Build Electric Vehicle Manufacturing Plants in U.S., Thailand

Starting in 2022, Apple's biggest iPhone assembler Foxconn will begin building electric vehicle plants to help offset the slowing smartphone industry.

The Taiwanese company seeks to build factories in the United States, Thailand, and possibly in Europe too. Foxconn expects to supply components for EV startups and accelerate production.

"Our plans are to begin mass production in the U.S. and Thailand respectively in 2023," Foxconn Chairman Young Liu told investors in an earnings call. "Other than in the U.S. and Thailand, we are also in talks with possible locations in Europe too as part of our global EV foot-print strategy."

According to Nikkei Asia, Foxconn is in negotiations with three states in the U.S. to build EV plants, and one of those states is Wisconsin. The state was previously targeted for a chip fabrication plant but could shift to electric vehicles as part of the new strategy.

In Thailand, Foxconn has partnered with Thai oil and gas conglomerate PTT to develop a platform for EV and component production. The U.S. plant will serve clients such as Fisker by the end of 2023.

With the "iPhone 13" production starting later in August, Foxconn remains the biggest iPhone assembler. The company's move into electric vehicles means it could be a strategic partner for manufacturing and assembling Apple Car. *Source: Wesley Hilliard, Apple Insider*

GE Aviation Wins \$716M Engine Contract For Indian Fighter Aircraft

Indian aerospace company, Hindustan Aeronautics Limited (HAL), has signed a \$716 million contract for 99 General Electric F404 engines. The deal with GE Aviation will see the F404-GE-IN20 engine power the Tejas, a light combat aircraft (LCA) with a single engine.

"This is largest ever deal and the purchase order placed by HAL for LCA," said R. Madhavan, chairman and managing director of HAL. HAL is working closely with GE for its support in pursuing LCA exports and also to supply spares to the global supply chain of GE 404 engines.



Chris Cyr, vice president, business development and sales at GE Aviation, who attended virtually, said his company is proud of the 16-year-long partnership with HAL and is happy to extend the relationship with this new order.

"The F404 family of engines has proven itself in operations all over the world and we have committed to deliver all 99 engines and support services by 2029," he added.

The indigenously-built Tejas aircraft has been in service since 2004. Ordering of the engines marks a major milestone in the execution of 83 LCA contract with Indian Air Force.

The co-operation will be enhanced with the manufacturing of GE F414 engines in India for the upcoming LCA MkII program. The highest thrust variant of the F404 family, the F404-GE-IN20 incorporates GE's latest hot section materials and technologies as well as FADEC for reliable power and outstanding operational characteristics.

The F404 family engines have logged more than 14 million engine flight hours and has powered 15 different production and prototype aircraft. *Source, Michael Tyrrell, Aerospace Manufacturing*

California to Build Temporary Gas Plants to Avoid Blackouts

California, a state that has been aggressively weaning its power grid off of fossil fuels, is now working on adding several natural gas-fired plants in an effort to keep the lights on this summer.

The California Department of Water Resources is in the process of procuring five temporary gas-fueled generators that have individual capacities of 30 megawatts, said spokesman Ryan Endean. The units will be installed at existing power plants and are expected to be operating by the middle of September.

The move comes after California Governor Gavin Newsom declared a state of emergency for the power grid on concern about supply shortages during hot summer evenings when solar production wanes. The order, issued last month, aimed to free up energy supplies and speed up power plant development to help avert blackouts. It also temporarily lifted air-quality rules.

Earlier this year, California regulators balked at ordering utilities to add new gas-fired generation after environmental groups said it would run counter to the state's decarbonization goals. Officials have been scrambling to shore up power resources ever since brief blackouts hit in August 2020 during an extreme heat wave.

The situation has become more dire this summer as a historic drought has reduced California's hydroelectric supplies. The state has been retiring gas plants under a goal to have its grid carbon-neutral by 2045.

The California Energy Commission approved on Tuesday licenses for the emergency gas generators for up to five years. <u>More on this story</u> Source: Energy Now Media