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# THE UPM MARKET INFORMER

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## Space Force Looks at Options for Relieving Cape Canaveral Launch Congestion

With increasing activity pushing Florida's launch sites to their limits, the Space Force is studying ways to move some of that activity elsewhere, including to California. In a presentation to the Federal Aviation Administration's Commercial Space Transportation Advisory Committee (COMSTAC) May 15, Maj. Gen. Stephen Purdy, whose roles include director of the Eastern Range and director of launch and range operations for the Space Force's Space Systems Command, noted the launch facilities at Cape Canaveral are nearing capacity.

"The Eastern Range is almost done doing everything it can do," he said. That has included allocating three unused launch pads in March to four companies developing small launch vehicles, with a second round planned for larger vehicles. "When that's done, we're going to be very, very close to out of pads on the Eastern Range."
When that is complete, there will be limited options, he suggested. Additional launch sites at the neighboring Kennedy Space Center could be built, but that would require working with NASA. He added he was working with Virginia's Mid-Atlantic Regional Spaceport on Wallops Island to support additional launches there, "but even they'll be tapped out eventually." That could open the door to more creative solutions. Purdy noted the Space Force studied the ability to conduct launches to polar orbits, traditionally flown from the Western Range at Vandenberg Space Force Base, from Florida. "It turns out you can," he said, with SpaceX launching several Falcon 9 missions to polar orbits in recent years from Florida.

"So we did the reverse: can you launch East Coast missions off the West Coast, from Vandenberg? Fascinatingly, you can," he said. Such launches had traditionally been ruled out because of trajectories that would take vehicles over land. He didn't elaborate on the analysis in his presentation, but said it "opened the door" for long-term discussions about eventually conducting launches to lower-inclination orbits from Vandenberg. "As we continue to hone safety analyses for the ranges, and as some particular launch providers have got a large number of successful launches, we've been able to narrow the boxes more and more," he said, referring to exclusion zones for launches.
That combination of reduced exclusion zones and improved vehicle track records, along with what Purdy described as a willingness to launch "with a couple boats in the water and perhaps a [general aviation] aircraft or two in the broad area," could enable launches from Vandenberg on eastern trajectories. "That possibility starts to be intriguing, so I would encourage a national-level conversation to start the groundwork of what that would look like."

Range and pad infrastructure is just one constraint on launch activity. He said the service needed to add more payload processing capacity at both Cape Canaveral and Vandenberg and was looking at options like establishing commercial payload processing facilities on Cape property. "We can prove definitively that if we don't set these plans in motion on the Eastern and Western Ranges, we will run out of payload processing capability for DoD missions alone." A third issue is personnel. "People remains our biggest issue. At some point, we are going to run out of people and time to support commercial launch on the Eastern and Western Ranges," he said. That includes security, emergency and engineering personnel needed to support each launch. "That's sustainable up to a number. We don't know what that number is, but we have some guesstimates," he said. "But at some point we break because we run out of people."

Staffing levels are set by the requirements to support DoD activities, which are about 10 launches per year. "We're not prepared or manned to support launch rates of 90," he said, the estimated number of launches on the Eastern Range in 2023. "I project we're going to be in the multiple hundreds here on a couple years." Read the full article here.

# Nickel/Cobalt & Stainless-Steel Flat Rolled Surcharges

| | Mar | Apr | May | June | July | Aug |
|---|---|---|---|---|---|---|
| 15-5 | 1.2015 | 1.12194 | 1.1235 | 1.1052 | * | * |
| 17-4 | 1.2168 | 1.1359 | 1.1396 | 1.1212 | * | * |
| 17-7 | 1.3272 | 1.2054 | 1.2296 | 1.2207 | * | * |
| 201 | 0.9618 | .8985 | 0.9302 | 0.8428 | * | * |
| 301 7.0% | 1.2923 | 1.1756 | 1.2011 | 1.1929 | * | * |
| 302/304/304L | 1.4342 | 1.2970 | 1.3216 | 1.3123 | * | * |
| 304-8.5% | 1.4991 | 1.3517 | 1.3746 | 1.3647 | * | * |
| 305 | 1.9593 | 1.7408 | 1.7525 | 1.7384 | * | * |
| 309 | 2.0026 | 1.7830 | 1.8042 | 1.7901 | * | * |
| 310 | 2.9352 | 2.5730 | 2.5748 | 2.5525 | * | * |
| 316/316L | 2.4610 | 2.2319 | 1.9784 | 1.9254 | * | * |
| 321 | 1.5565 | 1.3997 | 1.4196 | 1.4076 | * | * |
| 347 | 1.8607 | 1.7033 | 1.7217 | 1.7111 | * | * |
| 409/409 Mod | 0.3111 | 0.3387 | 0.3734 | 0.3722 | * | * |
| 410/410S | 0.3162 | 0.3432 | 0.3789 | 0.3789 | * | * |
| 430 | 0.3719 | 0.3975 | 0.4453 | 0.4453 | * | * |
| 439 | 0.3908 | 0.4166 | 0.4691 | 0.4673 | * | * |
| 263 | 11.7846 | 13.2813 | 12.3785 | 11.6182 | 10.2646 | 9.6772 |
| 276 | 11.153 | 13.5698 | 14.5412 | 14.9952 | 12.6782 | 10.9707 |
| A286 | 3.4243 | 4.0143 | 4.0365 | 3.8984 | 3.4292 | 3.3624 |
| 600 | 8.7808 | 10.2636 | 10.0981 | 9.4687 | 8.1466 | 8.3296 |
| 601 | 7.2046 | 8.3839 | 8.2504 | 7.7529 | 6.7394 | 6.8854 |
| 617 | 11.3131 | 13.1396 | 12.9453 | 12.5807 | 10.8897 | 10.0656 |
| 625 | 11.1493 | 13.0263 | 13.4647 | 13.444 | 11.7114 | 10.8917 |
| 718 | 9.713 | 11.0007 | 11.0906 | 10.8266 | 9.6864 | 9.4656 |
| X-750 | 9.0694 | 10.4613 | 10.3044 | 9.706 | 8.4810 | 8.6586 |
| 800 | 3.8869 | 4.5042 | 4.4588 | 4.2056 | 3.7000 | 3.7774 |
| 825 | 5.6952 | 6.7372 | 6.8800 | 6.7479 | 5.8487 | 5.5654 |
| HX | 7.9429 | 9.6011 | 10.0649 | 10.1612 | 8.6280 | 7.7294 |
| 188 | 14.5401 | 14.9566 | 12.1294 | 10.4308 | 10.1272 | 10.0419 |
| L-605 | 15.396 | 15.5962 | 12.1584 | 10.2033 | 10.0991 | 9.9560 |

*Surcharge currently not available

# Nickel/Cobalt & Stainless-Steel Bar Surcharges

| | Feb | Mar | Apr | May | June | July |
|---|---|---|---|---|---|---|
| 316LS/316LVM | 3.74 | 3.77 | 3.35 | 3.01 | 2.94 | * |
| Custom 455 | 2.02 | 1.94 | 1.80 | 1.87 | 1.80 | * |
| Custom 465 | 2.91 | 2.88 | 2.63 | 2.59 | 2.52 | * |
| Custom 630 | 1.43 | 1.38 | 1.33 | 1.36 | 1.30 | * |
| CCM | 14.34 | 12.34 | 12.61 | 11.18 | 9.06 | * |
| 625 | 14.37 | 14.45 | 12.67 | 11.62 | 11.21 | * |
| 718 | 10.87 | 10.71 | 9.48 | 9.24 | 8.80 | * |
| 718CR | 10.87 | 10.71 | 9.48 | 9.24 | 8.80 | * |
| A286 | 5.45 | 5.30 | 4.73 | 4.71 | 4.50 | * |
| A2861 | 5.45 | 5.30 | 4.73 | 4.71 | 4.50 | * |
| A2862 | 5.45 | 5.30 | 4.73 | 4.71 | 4.50 | * |
| A2867 | 5.45 | 5.30 | 4.73 | 4.71 | 4.50 | * |
| A286R1 | 5.45 | 5.30 | 4.73 | 4.71 | 4.50 | * |
| A286SH | 5.45 | 5.30 | 4.73 | 4.71 | 4.50 | * |
| Wasp6 | 13.56 | 12.82 | 11.53 | 11.04 | 10.15 | * |
| L605 | 13.81 | 12.10 | 12.41 | 11.87 | 10.22 | * |
| 321 | 2.35 | 2.25 | 2.06 | 2.11 | 2.00 | * |
| 347 | 2.35 | 2.24 | 2.05 | 2.10 | 1.99 | * |
| Greek Ascoloy | 1.47 | 1.49 | 1.49 | 1.50 | 1.51 | * |

*Surcharge currently not available

# Titanium Surcharges

| Form | Grade | Q1 Surcharge | Q2 Surcharge |
|---|---|---|---|
| TISH | 6AL4V | 5.56 | 8.80 |
| TIPL | 6AL4V | 3.71 | 5.87 |
| TIPL | 6AL4VE | 4.08 | 6.45 |
| TIBR | 6AL4V | 7.50 | 6.88 |
| TIBR | 6AL4VE | 4.45 | 4.45 |
| TICO | GR 2 | 8.33 | 8.69 |
| TICO | GR 3 | 8.33 | 8.69 |
| TICO | GR 4 | 8.33 | 8.69 |
| TISH | GR 2 | 8.33 | 8.69 |
| TISH | GR 3 | 8.33 | 8.69 |
| TISH | GR 4 | 8.33 | 8.69 |

## Archer Rolls Out First Midnight Aircraft; Prepares for Flight Test

In an Archer Aviation Inc. (NYSE:ACHR), a leader in electric vertical takeoff and landing (eVTOL) aircraft, today announced it has now completed the final assembly of its first Midnight aircraft. With final assembly and initial testing complete, last week the aircraft was shipped from Archer's Palo Alto facility to its flight test facility in Salinas, California and reassembled. Archer will now take this aircraft through a series of ground tests leading up to its planned first flight this summer. The Midnight aircraft has recently garnered significant attention from the U.S. Department of Defense given its payload capabilities.

This Midnight aircraft will enable Archer to perform critical "company testing" to accelerate and reduce risk on its certification program with the Federal Aviation Administration ("FAA") in advance of "for credit" certification testing that the company plans to begin early next year with piloted Midnight aircraft. Our strategy with this aircraft is to allow Archer to fly many of the same test points that will be needed during piloted "for credit" flight testing in order to further validate the aircraft before the FAA witnesses and participates in the testing - a customary practice in many aircraft certification programs.

Component manufacturing is already underway for Archer's conforming Midnight aircraft. Archer is targeting the completion of final assembly of its initial conforming Midnight aircraft in Q4 2023 and to begin piloted flight test operations in early 2024.

"Today we announced our exciting progress that the final assembly of our first Midnight aircraft is now complete and it is preparing for its flight test program," said Adam Goldstein, Archer's Founder and CEO. "This aircraft will accelerate and reduce risk on our certification program paving the way for our team to focus on building and conducting piloted operations with conforming aircraft to support the goal of enteringinto service in 2025." Archer's industry-leading team, alongside its key strategic partners, Stellantis and United Airlines, continues to advance its aircraftdevelopment and commercial operations with impressive speed and efficiency. The company has also established a significant lead over industrypeers on the manufacturing and commercial operations fronts with the build out of its high-volume manufacturing facility in Covington, Georgia underway and announced key strategic electric air taxi routes in New York and Chicago. Read the full articlehere.

## Rolls-Royce Completes Successful First Tests of UltraFan Engine

Rolls-Royce has announced it has successfully completed the first tests of its UltraFan technology demonstrator at its facility in Derby.

The first tests were conducted using 100% Sustainable Aviation Fuel (SAF).

This is a historic moment for Rolls-Royce – it's the first time in 54 years the aero-engine manufacturer has tested a brand-new engine architecture and is proof of what can be achieved when industry and Governments work together.

Confirming the capability of the suite of technologies incorporated in the demonstrator is a big step towards improving the efficiency of current and future aero-engines.
UltraFan delivers a 10% efficiency improvement over the Trent XWB, which is already the world's most efficient large aero engine in service.

In the nearer term, there are options to transfer technologies from the UltraFan development programme to current Trent engines, providing customers with even greater availability, reliability and efficiency.

In the longer term, UltraFan's scalable technology from ~25,000-110,000lb thrust offers the potential to power new narrowbody and widebody aircraft anticipated in the 2030s.

Tufan Erginbilgic, CEO, Rolls-Royce, said: "The UltraFan demonstrator is a game changer – the technologies we are testing as part of this programme have the capability to improve the engines of today as well as the engines of tomorrow. That is why this announcement is so important – we are witnessing history in the making; a step-change in engine efficiency improvement. When combined with Sustainable Aviation Fuels, more efficient gas turbine engines will be key to hitting the industry's target of Net Zero flight by 2050. Today we are closer to achieving this ambition.

"Collaboration is key in driving the decarbonization of air travel and the UltraFan programme is a great example of what can be achieved when government and industry come together with a common purpose."

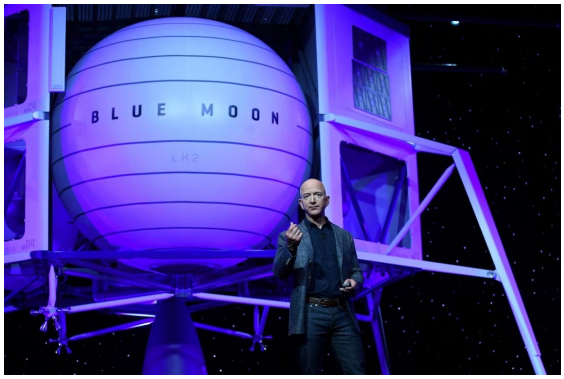
The tests took place in the world's largest and smartest indoor aero-engine testing facility – Testbed 80. The 100% SAF, derived primarily from waste-based sustainable feedstocks such as used cooking oils, was provided by Air bp.

Testing the demonstrator is the culmination of many years work, which has been supported by the UK Government through the Aerospace Technology Institute (ATI), Innovate UK; the EU's Clean Sky programmes plus LuFo and the State of Brandenburg in Germany.

UltraFan has been a decade in the making, with the concept unveiled publicly in 2014. It is a fundamentally different designarchitecture to that within the approximately 4,200 Rolls-Royce Civil large engines currently in service, as it incorporates a geared design that no other industry player has produced at this size before. Demonstrating at this scale gives us the flexibility to scale down as required by our customers

It will also put us in the unique position of being able to offer a portfolio of two-shaft, three-shaft, direct drive and geared propulsion solutions to power future aircraft. Read the article full here.

## Bezos' Blue Origin Wins NASA Contract to Build Astronaut Lunar Lander




A team led by Jeff Bezos' Blue Origin won a coveted $3.4 billion NASA contract to build a spacecraft to fly astronauts to and from the moon's surface, the U.S. space agency said on Friday, a breakthrough for the company two years after it lost out to Elon Musk's SpaceX in another competition. Blue Origin plans to build its 52-foot (16-meter) tall Blue Moon lander in partnership with Lockheed Martin Corp (LMT.N), Boeing Co (BA.N), software firm Draper and robotics firm Astrobotic. NASA picked Blue Origin over a rival bid led by Leidos Inc-owned (LDOS.N) defense contractor Dynetics that also included Northrop Grumman Corp (NOC.N).

NASA's decision to go with Bezos and Blue Origin will give it a second option for sending astronauts to the moon under its Artemis program. NASA awarded fellow billionaire Musk's SpaceX $3 billion in 2021 to build its Starship spacecraft to land astronauts on the lunar surface for the first time since the final Apollo mission in 1972. The first two Starship missions are slated for later this decade. "I've said it before: we want more competition, we want two landers, and that's better," NASA Administrator Bill Nelson said at an event announcing the contract at NASA's headquarters. "It means that you have reliability, you have backups."

The contract follows NASA's trend in recent years in which it helps fund development of private astronaut spacecraft, then pays to use the craft in missions rather than spending more to own the vehicle entirely. Blue Origin, founded in 2000, is investing "well north" of the $3.4 billion figure to develop the spacecraft, the company's lunar lander chief John Couluris told reporters at the event. Couluris said that Blue Origin, not NASA, would pay for any cost overruns. "Honored to be on this journey with @NASA to land astronauts on the Moon - this time to stay," Amazon.com (AMZN.O) billionaire founder Bezos said on Twitter after the announcement. NASA said in a contract document that it picked Blue Origin's proposal for its lower price, extra lander capabilities and a plan to execute two test landing missions on the moon in 2024 and 2025 at the company's expense. But NASA expressed concern about "numerous conflicts and omissions" in Blue Origin's proposed schedule and development deadlines.

The Dynetics-led bid raised NASA concerns over whether it met technical requirements, and the price was "substantially higher," the contract document said. The Artemis program envisions building a long-term presence on the moon. SpaceX's Starship lander is poised to conduct the first two astronaut moon landings, followed by a similar mission in 2029 with Blue Origin's lander. Each are expected to put two astronauts on the moon's surface. Friday's announcement was a long-awaited outcome for Bezos, who has invested billions of dollars for Blue Origin to vie for high-profile space awards. Read the article here.

## UPM Shop Talks: Eric Goebel, CNC Machinist and Additive Solutions Provider

At United Performance Metals, we take great pride in being a solution-center for our customers and our ability to serve whatever they need. To learn more about the bones of UPM' business, we are happy to introduce a new series "UPM Shop Talks", where we interview and highlight individual members of our warehouse team who handle the material day to day .To start this series off, we would like to highlight Eric Goebel of UPM Additive Solutions.

Prior to becoming a resident CNC machinist at UPM Additive Solutions, Eric Goebel worked at Meyer Tool, serving primarily the aerospace industry. He left his previous company to become a nurse, but COVID-19 unfortunately derailed this plan. In the midst of the pandemic, Eric was referred to UPM by a friend and hired over the phone. He recalled that he "was really intrigued by the idea of UPM Additive's start-up mentality and was a little skeptical that our additive branch would take off as well as it has."

Speaking on his specific job functions and the industries that UPM Additive Solutions serves, Goebel said "I work a lot with all of our machines. I use the wire EDM, grinders, drillers, and Blancher on a daily basis. On a typical day, we get all of our material ready depending on the job, customer, and their specs. We refurbish plates with our blancher to make sure the plate is up to the customer specifications and that it is ready to be printed on. Everything we do is rooted in providing the additive industry with a foundation. We get to make the material that is used on rockets, and I just think that's really cool." Goebel also spoke of the laser capabilities that the additive team has saying, "We basically engrave the information the print requires onto the side of the plate and we're moving into putting QR codes on our build plates".

While UPM Additive Solutions is still a young operation, Goebel is excited at the growth and promise it has shown in its first two years. "The space race is on again, and we need to be the on-demand solution provider for companies that are innovating and trying to make space the next home for humanity. There will be competition. Our goal is to make sure that we squash it. We want everyone to come to us. Everyone in the shop takes pride in their work and we recognize people for their individual accomplishments. We're going to expand so much that we can be the one-stop shop for companies to get solutions to their additive problems."

To learn more about UPM Additive Solutions click here! Follow our new UPM Additive Solutions page on LinkedIn for updates.