Rocket Report: Omega rocket blows a nozzle, NASA still wants 2020 SLS launch

Enlarge / The mighty Delta IV Heavy rocket takes to the skies.

reader comments

127 with 46 posters participating

Share this story

Welcome to Edition 2.02 of the Rocket Report! We've got lots of heavy-lift news this week, including reports on potential problems with a test of the Omega rocket's large first stage and a messy political decision surrounding NASA's choice of rockets for the high-profile Europa Clipper mission.

As always, we welcome reader submissions, and if you don't want to miss an issue, please subscribe using the box below (the form will not appear on AMP-enabled versions of the site). Each report will include information on small-, medium-, and heavy-lift rockets as well as a quick look ahead at the next three launches on the calendar.

Senate bill calls for use of commercial spaceports. The Senate Armed Services Committee approved three amendments in its version of the National Defense Authorization Act for FY 2020 related to the burgeoning small-launch industry, SpaceNews reports. According to the report, the Department of Defense

must devise a plan to make greater use of commercial spaceports to launch small satellites, develop a strategy to integrate commercial capabilities into space operations, and investigate China's investments in its small satellite and small launch industries.

Four spaceports named … The bill requires the Defense Department to submit a plan within 270 days after the law's enactment. In seeking lower-cost launch services, the bill says the military should consider using: Spaceport America in New Mexico, Pacific Spaceport Complex-Alaska, the Mid-Atlantic Regional Spaceport in Wallops Island, Virginia; and the Oklahoma Air & Spaceport. (submitted by Ken the Bin)

Utah company eyes Ecuador launch site. Sugarhouse Aerospace, which is developing a suborbital launch vehicle, said it has selected Ecuador as the ideal place for a future spaceport with the goal of sending equatorial launches into space. Sugarhouse's first launch from the Ecuador facility is planned for as early as fall 2020.

Already in New Mexico … The company says its rocket can loft payloads to an altitude of 125km, exposing them to 5 to 7 minutes of microgravity time, before electing to deploy in space or return to Earth. The Sugarhouse 1 rocket may make its first flight as early as late 2019, and the company says it already has flight operations based at Spaceport America in New Mexico. This is another case of we'll believe it when we see it, but we're intrigued. (submitted by Raillon)

Hot Shot program heats up. The US Department of Energy's Sandia National Laboratories has continued to develop its Hot Shot sounding-rocket program that seeks to lower the cost of testing components and applications in space. The program conducted two flights on April 23 and April 24 at the Kauai Test Facility in Hawaii, the lab reports. The rockets also featured several improvements over the previous one launched last year, including new sensors to measure pressure,

temperature, and acceleration.

Using surplus rocket engines … Sandia is planning another pair of launches this August. The name Hot Shot comes from the term "high operational tempo," which refers to the relatively high frequency of flights. A brisk flight schedule allows scientists and engineers to perform multiple tests in a highly specialized test environment in quick succession. Sandia uses refurbished, surplus rocket engines, making these test flights more economical than conventional flight tests common at the end of a technology's development.

Starliner progressing toward launchpad. It has been a good couple of weeks for Boeing and United Launch Alliance as they prepare for an uncrewed test flight of the Starliner spacecraft. ULA has already delivered the Atlas V rocket for that first flight to Cape Canaveral, Florida, and last week, the rocket for the first crewed flight test left the company's factory in Decatur, Alabama.

August test flight possible … Meanwhile, Boeing said on May 23 that it had completed hotfire testing of the spacecraft's entire propulsion system, including various thrusters, fuel tanks, and related systems within a "flight-like" service module of the spacecraft. The success of the testing allows the program to move ahead with a pad abort test later this summer, SpaceNews reports. An uncrewed launch of the Starliner spacecraft, similar to SpaceX's Demo-1 flight of its Crew Dragon spacecraft in March, is scheduled for no earlier than mid-August. (submitted by Ken the Bin)

SpaceX launches Starlink broadband satellite mission. With a mass of 18.5 tons, SpaceX has performed its heaviest launch to date by boosting 60 Starlink satellites, each weighing 227kg, to an altitude of 440km. About 1 hour 3 minutes after the

launch, the entire stack of 60 satellites floated away from the Falcon 9's second stage. Slowly—very slowly, it appeared—the 60 satellites began to drift apart. The company said the deployment was a success.

A train of satellites in the night sky … Soon after the launch, astronomers began capturing photos of a "train" of satellites traveling overhead. This has raised some concerns about how the launch of thousands of more Starlinks (and those of other proposed megaconstellations) will affect our view of the night sky. For now, the jury is out. And almost certainly, the cat is out of the bag. This tweetstorm from Phil Metzger does a masterful job of putting this all into context. (submitted by sdean7855 and Max Q)

Crew Dragon may still fly in 2019. In parallel with an ongoing failure investigation, SpaceX is readying downstream Crew Dragon spacecraft for flight in hopes that corrective actions can be implemented in time to launch two astronauts to the International Space Station before the end of the year, Spaceflight Now reports. On April 20, the Crew Dragon slated for the in-flight abort test exploded on a test stand at the Cape Canaveral Air Force Station an instant before a planned static firing of the capsule's eight Super Draco abort engines. No one was injured, but the Demo 1 capsule was destroyed.

A long way to go … During a National Advisory Council meeting this week, Kathy Lueders, manager of NASA's commercial crew program, said the capsule originally intended to carry the first astronauts will now be used for the in-flight abort test. Another downstream capsule, originally planned for the first operational Crew Dragon flight to the ISS, will serve as the Demo 2 vehicle. "We've got to make sure we've really taken our learning from this anomaly investigation and made sure that if we need to make a change to the vehicle that it gets done. I think that's the big thing," Lueders said. A 2019 crew launch seems unlikely given all the investigative work that

needs to be done, but we're glad it's still on the table. (submitted by Ken the Bin and Unrulycow)

Northrop test fires Omega's first stage. On Thursday afternoon at 3:05pm ET, Northrop Grumman conducted a full-scale static fire test of the first stage of Omega, the company's new intermediate/heavy-lift rocket for national security missions. The test firing took place in Promontory, Utah. The test occurred on time, and the company declared it to be "successful." However, video of the test showed part or all of the engine nozzle breaking off at the end, and it is unclear how this will affect development of the booster.

A critical test … Omega measures more than 12 feet in diameter and 80 feet long, and its first stage will fire for 122 seconds and produce more than 2 million pounds of thrust. The test firing comes as the Air Force is soliciting bids for national security launch contracts from 2022 to 2026, and Northrop is bidding Omega against competition from United Launch Alliance, Blue Origin, and SpaceX. This raised the stakes for success with Thursday's test.

Starship may begin new hop tests in early June. While it begins construction of a new Starship test vehicle in Florida, SpaceX is preparing to restart test operations in Texas, where the prototype "Starhopper" will perform an incremental series of untethered test hops. Pending any technical difficulties or interruptions, SpaceX will attempt an untethered hop test with a target altitude of 20m early next month, NASASpaceflight.com reports.

Changes all the time … The article describes various upgrades since the Starhopper vehicle made a short, tethered hop in early April, including new composite overwrap pressure vessels and plumbing. Seeing the public development and the iterative

designs play out in real time is really interesting. (On Thursday, Elon Musk indicated that Starship's wings and leg design were changing again). We have it on good authority that top NASA officials are tracking these developments, even if they're not talking publicly much about them. (submitted by Unrulycow)

NASA still says it could make 2020 SLS launch. NASA believes it is possible to fly the Space Launch System before the end of 2020 even if the agency decides to retain some version of a key static-fire test of the rocket's core stage, SpaceNews reports.

To green run or not to green run? … Bill Hill, deputy associate administrator for exploration systems development, said that the agency has yet to decide whether to perform what's known as the "green run," where the core stage and its four RS-25 engines are fired for eight minutes on a test stand at the Stennis Space Center in Mississippi. "We provided the agency with a recommendation. The agency is contemplating it," he said, not discussing what that recommendation stated about the green run. "Today, our baseline is a green run." Ars has previously reported that the recommendation was to conduct the green run, and we'd be shocked if NASA's leadership decides to reject the recommendation. We'd also be shocked if the SLS launches in 2020. (submitted by Ken the Bin)

Rocket choice looms in Europa Clipper mission. NASA's Inspector General warns that the current launch dates for two missions to study Jupiter's moon Europa are unrealistic despite the large sums of money allocated by Congress, according to Space Policy Online. The Europa Clipper and Europa Lander missions are required by law to be launched in 2023 and 2025 on NASA's Space Launch System, but that is unlikely to happen because of developmental and workforce challenges, according to the inspector.

Decision needed soon on booster … One of the central questions

relates to the readiness of the SLS rocket by 2023 for the Clipper science mission (highly, highly unlikely according to the inspector). The White House prefers to save up to $700 million by launching the mission on a Delta IV Heavy or Falcon Heavy rocket. Congress has mandated the SLS. A decision probably needs to be made by this fall, mission planners say.

Russia says super-heavy rocket needed for its Moon mission. Dmitry Rogozin, the leader of Russia's state space corporation, gave a wide-ranging talk last Thursday at Moscow University. The speech sought to describe activities happening now at Roscosmos and what may happen in the future, including a potential lunar landing, Ars reports.

Lunar landing by 2030? … Under the plan outlined by Rogozin, the country will initially develop a new "Super Heavy" booster with a capacity of 103 metric tons to low Earth orbit and 27 metric tons to Lunar polar orbit. This is roughly equivalent to an upgraded version of NASA's Space Launch System, known as Block 1B. A crew landing on the Moon could occur as early as 2030, said Rogozin. We've heard various things about the future of Rogozin at Roscosmos, so we're not putting too much stock into these statements.

Next three launches

June 5: Long March 11 | Two Jilin-1 Earth-imaging satellites | Sea-based platform in Yellow Sea | TBD

June 15: Falcon 9 | Radarsat Constellation | Vandenberg AFB, Calif. | TBD

June 20: Ariane 5 | DirecTV 16 and Eutelsat 7C satellites | Kourou, French Guiana | 21:41 UTC

https://arstechnica.com/?p=1512771