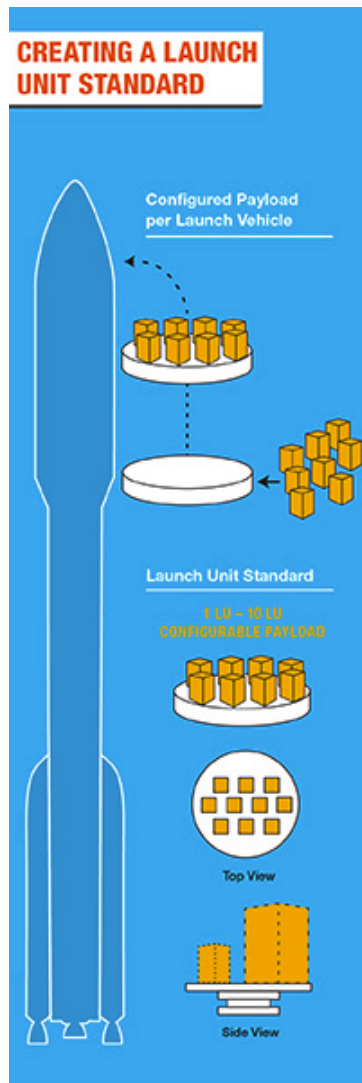


Aerospace Out to Launch Small Sats Better

by Laura Johnson
January 29, 2018

How do you most efficiently launch small satellites?



To answer that question, Aerospace is leading a discussion with industry, academia, and government participants about setting a standard Launch Unit, or Launch-U, for satellites between the size of a toaster and a small refrigerator.

“With the Launch Unit standard we’ll be able to maximize the efficiency of the launch vehicle fairing and fill it up with more satellites and thereby increase access to space for everybody,” said Carrie O’Quinn, Aerospace’s lead on this effort.

The Problem

CubeSats are a standard size, which makes launching them rather simple. A launch vehicle can fit a certain number of CubeSats, and one CubeSat can be switched for another if there is a change in plans. In contrast, large satellites merit their own launch vehicle. But what about mid-sized small satellites, specifically those between the size of a 12U CubeSat and what is known as an ESPA-class small sat?

It turns out there are not standards for this class of satellites, which means each satellite generates its own launch integration requirements for each respective launch vehicle. This is simply not efficient and creates challenges for satellite developers and the launch community, and the situation will only be exacerbated as the number of small sats continues to grow.

The Solution

The Launch-U could address this problem. Just like the CubeSat definition standardized the launch interface, defining intermediate small-sat classes could have the same revolutionary impact on the industry. It would make better use of cargo space on launch vehicles and also provide more flexibility in regards to launch opportunities.

“With the Launch Unit standard, if your intended ride to space doesn’t work out, you could simply switch to another ride that day, similar to how you can load a shipping container onto one ship or another without any need for special interfaces,” said Andre Doumitt, a systems director in the Innovation Development group at Aerospace.

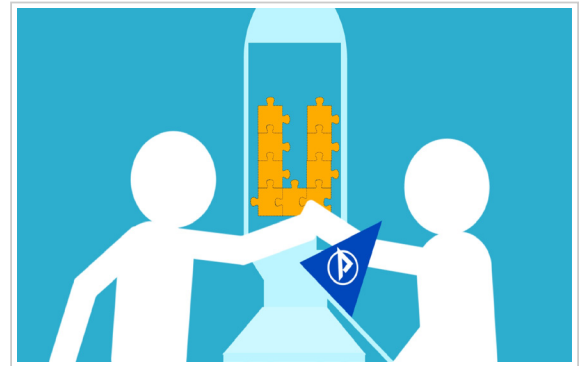
As it becomes possible to swap satellites into predefined launch configurations, more launch opportunities will become available for everyone.

“Similar to what happened in the shipping container world, if more satellite makers can get a ride when and where they want, demand will grow, which benefits all players in the satellite industry—launchers, satellite builders, government customers, and commercial end-users,” Doumitt said.

The Working Group

Coming up with a standard could potentially be tricky since each company has its own preferences. Aerospace, however, is in a unique position to guide this conversation as an unbiased, nonprofit, federally funded research and development center.

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"We're not defining a solution that's specific to our launch vehicle, adaptor system, or satellites," O'Quinn said. "We're helping reach across the whole community to find out how each of them would best implement this practice, and as an independent corporation, we can do that without any bias for our own self-interest."

The working group is meeting regularly and includes representatives from Virgin Orbit, VOX Space, United Launch Alliance, SpaceX, Tyvak, Cal Poly, Moog CSA Engineering, and Spaceflight Industries.

"I'm excited that The Aerospace Corporation is working with new space companies on defining a 'Launch Unit' that will assist in the future growth of the small satellite market," said Chad Foerster, Virgin Orbit's manager of 2nd Stage Structures and Mechanisms.

He continues: "The synergy between The Aerospace Corporation's extensive history of providing comprehensive engineering support and mission assurance activities for national launch, along with the innovative and disruptive ideas of new space entrants, will help change the paradigm of delivery of small satellites into space similar to how standardized shipping containers dramatically reduced the costs of transport and supported the post-war economic growth in the 1950's."

Launch-U in the News

Check out media coverage of Aerospace's Launch-U concept:

- [L.A. Business Journal](#)
- [Space.com](#)

New Avionics System Takes First Ride on Delta IV

by **Randolph L Kendall**

January 15, 2018

A little more than six months ago, the booster for a Delta IV security agency mission was erected on-pad at SLC-6 at Vandenberg Air Force Base, Calif.

Since then, the combined United Launch Alliance (ULA), Air Force, and Aerospace team have done a tremendous amount of work to ensure the rocket would be ready to fly successfully. But the story doesn't end there, because in addition to the standard set of mission assurance activities for any national security satellite, this mission was especially challenging due to it being the first flight to use the new Common Avionics suite on the Delta IV vehicle. This was a change that had been in work for more than six years due to the need to replace obsolete avionics components, stabilize the industrial base, and reduce costs. Common Avionics had previously flown on Atlas V, but this first flight on Delta IV required a complete re-evaluation of the vehicle electronics. As CEO Steve Isakowitz was heard to say at the Aerospace President's Review – "the paint job looks the same, but pretty much everything inside is new."

In addition to new hardware, new flight software and an entirely new ground system had to be put in place at SLC-6 to control the new avionics. The new ground system also required two wet dress rehearsals prior to Christmas to verify that it was ready to support the new systems. Throughout it all, the Aerospace Delta IV team was there step-by-step with ULA verifying critical operations and conducting independent assessments and analyses.

At the end of all this work, the team was able to provide a high confidence recommendation to Aerospace and SMC leadership that the mission was ready to fly.

Ironically, after dry weather for months, the first planned launch date on Wednesday, Jan. 10, had to be scrubbed due to high winds from a storm that was passing through California. Thursday proved to be perfect weather for launch, however the ground systems had a few last surprises for the launch team to work through. On Friday though, everything finally came together and the Delta IV M+ (5,2) vehicle with two solid rocket strap-ons lifted off at 2:11 p.m. Pacific Time, flew a flawless trajectory, and successfully separated the spacecraft 90 minutes later.

As is common in the space business, a tremendous amount of work was required to make something very hard look very easy, in order to provide our country with a very important national security capability. This was the 124th successful ULA launch, the 36th Delta IV launch, and the 7th Delta IV from VAFB.

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A Delta IV rocket carrying a national security satellite lifts off from Vandenberg AFB on Jan. 12. (Photo: United Launch Alliance, LLC)

Quick Turnaround on SBIRS Launch Tests Flight Team

by **Randolph L Kendall**
January 22, 2018

This past Friday night, on a chilly Florida evening (we don't get to say that very often), an Atlas V rocket with one strap-on solid rocket motor, successfully launched the SBIRS-GEO Flight 4 mission into orbit from the Cape Canaveral Air Force Station. This flight required the team to make a quick turnaround, coming just seven days after a Delta IV national security launch at Vandenberg Air Force Base.

Interestingly, it was also almost exactly one year — 364 days — after the previous SBIRS GEO Flight 3.

After the first launch attempt last week was scrubbed on Thursday due to a problem with a ground system valve, the crews worked through the night to troubleshoot the problem and be ready for Friday. Having resolved the valve problem, the countdown on Friday ran like clockwork, with virtually no issues during the count and a similarly flawless flight.

The coast-to-coast one-week turnaround set a new standard for United Launch Alliance flights in the era of common avionics between Delta and Atlas rockets, where there are many more common crossover items to evaluate in between launches. As Col. Rob Bongiovi, the new Launch Enterprise SPO Director, commented at the post-flight quick-look review after the launch — “time after time, we put this team in extremely demanding positions — and you come through every time, without fail — my congratulations to the whole team!”

This launch was the 75th successful Atlas V flight and the 125th successful ULA mission since its formation in 2006.



An Atlas V streaks through a chilly Florida evening sky carrying the fourth SBIRS GEO satellite to orbit. (Photo: United Launch Alliance, LLC)

Safety Campaign Kicks Off

by **Gail Kellner**
January 10, 2018

President and CEO Steve Isakowitz recently signed an Executive Commitment to Safety to formally announce the company's dedication to creating a workplace that is safe, healthy, and injury-free.

This document, which will be prominently posted in key locations, is based on the underlying belief that all injuries and occupational illnesses can be prevented, and that Aerospace will strive toward the goal of zero instances in the future.

As stated in the document, “We have many important initiatives and imperatives to help keep our organization effective and healthy, and safety is an integral part of these.”

Management is expected to lead by example, the document says, and they will be accountable for the safety and well-being of their staff. They are also expected to encourage and support all employee suggestions related to a safer and healthier workplace.

The document concludes: “Our long-standing corporate values – dedication to mission success, technical excellence, commitment to our people, objectivity and integrity, and innovation – all rely on our ability to work safely. Safety is everyone's responsibility.”



President and CEO Steve Isakowitz, flanked by Dr. Willie Krenz, left, and Dr. Wayne Goodman, signs the Executive Commitment to Safety. (Photo: Elisa Haber)

Malissia Clinton Delivers MLK Jr. Luncheon Keynote

January 12, 2018

Malissia Clinton, Aerospace senior vice president, general counsel, and secretary, was the keynote speaker on Wednesday, Jan. 10, at the annual Dr. Martin Luther King Jr. Luncheon. The event was held in the Gordon Conference Center at the Los Angeles Air Force Base.

Clinton recounted her experiences growing up in South Central Los Angeles, while also addressing the hardships and adversity faced and overcome by her civil rights activist grandparents. She shared a powerful story related to the firebombing of her Manhattan Beach home in 1945, and the subsequent outpouring of community support.

Her keynote speech was a reprisal of her 2016 TEDx Talk, which can be viewed [here](#).



Malissia Clinton gives the keynote address at the MLK Jr. Luncheon. (Photo: Sarah Corrice)

Awards and Recognitions, January 2018

by Gail Kellner
January 24, 2018

Aerospace employees frequently earn recognition for their professional accomplishments. This Orbiter feature acknowledges those honors and awards, including the publication of books. To nominate someone for consideration in this section, send details of the award in a timely fashion to orbiter@aero.org, or contact Gail Kellner at gail.d.kellner@aero.org.

Dr. Susan Wilkerson and Dr. Robert Luter

Dr. Susan Wilkerson and Dr. Robert Luter, both senior project engineers in the Civil Systems Group's Department of Energy National Nuclear Security Administration (NNSA) Directorate, received an NNSA Defense Programs Award of Excellence for support of program management and execution and for significant contributions to the Nuclear Stockpile Stewardship Program.

Aerospace's GOES-R Team

NASA presented Aerospace's GOES-R Image Navigation and Registration (INR) support team with the GOES-R Flight Project Significant Achievement Award. GOES-16 is the newest NASA/NOAA geostationary weather asset. The Aerospace team was responsible for developing and operating a tool set relied on heavily by the GOES-R (now GOES-16) flight project to assess INR performance for the two optical payloads on GOES-16.

Those receiving the award include: Scott Houchin, Brian Porter, Philip Slingerland, Peter Isaacson, Charles Fink, Thomas Grycewicz, Christopher Folley, Patrick Johnson, Donald Rudy, Pradeep Thiyanaratnam and Evan Haas from ETG; Frank De Luccia and Gabriel Moy from CSG; and Justin Graybill from NSG.



January 2018 Obituaries

by **Jessie Ding**
January 01, 2018

Sincere sympathy is extended to the families of:

Paul E. Clayton, office of technical staff, hired Dec. 4, 1961, retired Feb. 1, 1975, died Aug. 21, 2017

Ava Knose, office of technical staff, hired Aug. 14, 1972, retired Apr. 1, 1999, died Nov. 27, 2017

Walter Mc Clennan, member of technical staff, hired Feb. 19, 1980, retired Sep. 1, 1986, died, Nov. 4, 2017

Ernest Y. Robinson, member of technical staff, hired June 20, 1977, retired Feb. 1, 2003, died Dec. 7, 2017

Milton Rosen, member of technical staff, hired Jan. 5, 1981, retired Dec. 1, 1990, died Nov. 16, 2017

Ruth Watson, office of technical staff, hired March 5, 1979, retired April 1, 1988, died Nov. 7, 2017

To notify Aerospace of a death and have it included in the Orbiter, please contact People Operations at (310) 336-5107

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