Testimony of
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Subcommittee on Strategic Forces
Committee on Armed Services
U.S. House of Representatives

Chairman Rogers, Ranking Member Cooper and Members of the Subcommittee – thank you for the opportunity to appear today to discuss the Evolved Expendable Launch Vehicle (EELV) program and the future of space launch.

Space systems are an integral part of today's technology driven world. Space has become critical to our national security, economic prosperity, and scientific advancement.

As this committee knows well, space systems are vital to every aspect of national security and provide warfighters and policymakers with critical and timely information that often makes the difference between life and death. Modern weapon systems rely on space capabilities for command, control, and precision guidance. The nation's leaders rely on space systems for critical intelligence and control of strategic forces. On the tactical side, space is integral to military operations and provides an irreplaceable asymmetric advantage on the battlefield. In short, national security demands and expects space capabilities to be there when needed. However, U.S. space systems are also increasingly vulnerable to a variety of threats, both man-made and natural threats. Therefore, to ensure the nation has the capabilities it needs, assured access to space is, and should remain, a fundamental tenet of space policy.

To that end, my company, United Launch Alliance (ULA), has consistently delivered 100 percent mission success over 94 consecutive launches; with 81 successful launches for the EELV program since 2002. We are currently at a tempo of about one launch every month. Our record on reliability, readiness, and on-time schedule performance is unsurpassed. ULA's rockets have safely delivered nearly all of the U.S. national security space systems on orbit today. ULA's Atlas V and Delta IV rockets are the most powerful and most reliable in the

world. They are the only rockets that fully meet the needs of the national security community. We are very proud to be the nation's assured access provider.

While mission success and schedule reliability should always remain top priorities, space launch is entering a new more competitive era. We welcome the competition. I'm optimistic about the future of space launch and optimistic about what my company can do for the nation. Thank you for the opportunity to share my plans on what ULA is doing to transform its approach to launch and affordable assured access to space while maintaining our focus on mission success.

Our overarching goals are:

1. significantly reduce the cost of launch,
2. develop a new domestic rocket engine to replace the Russian RD-180 engine,
3. increase our launch capability.

ULA has been committed to and continues to reduce costs of launch not only for our critical National Security Space customers, but to our civil and commercial customers. The GAO recently released its annual report "Defense Acquisitions: Assessment of Selected Weapon Programs," March 2015 where it acknowledged the Air Force realized savings by the EELV Program of $4.4B due to the negotiation of a firm-fixed-price, multi-year procurement contract for launch services. ULA committed to deliver those savings without sacrificing the overall process reliability, insight and oversight requirements that these critical National Security Space assets demand, the flexibility that our national security demands to support critical operations throughout the globe and maintaining 100% mission success focus.

As ULA looks to the future acquisition environment and the space launch requirements, we have chosen to redefine our approach that will continue to reduce the cost of launch, increase overall system flexibility and provide for new capabilities to support space based architectures of the future. The centerpiece of our plan is a new launch vehicle, currently dubbed the Next Generation Launch System (NGLS), which we're targeting for first flight in 2019. The NGLS will have an American engine; it will be less expensive; and it will have greater capability than

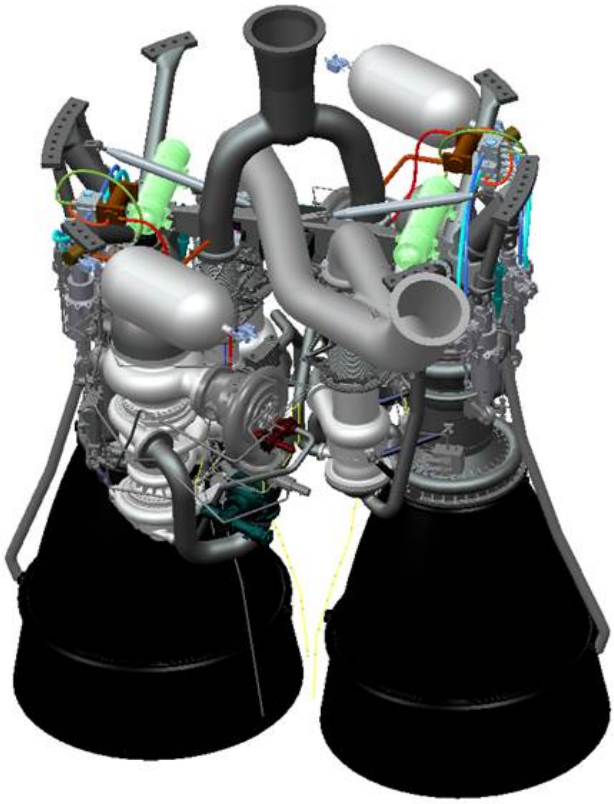
our current fleet. NGLS is designed to meet both commercial requirements and the Air Force's EELV program requirements, and we will work closely with the government to obtain NGLS certification. We will be unveiling more details about the rocket in the coming months, but a key feature that I know is of interest is the new domestic first stage engine, the BE-4 from Blue Origin.

Last summer, we entered a strategic relationship with Blue Origin, founded by Amazon.com's Jeffrey Bezos, to develop the BE-4 liquid natural gas rocket engine. We partnered with Blue Origin for several reasons. The BE-4 engine's high-performance, low cost, and potential reusability made it very attractive. Also, given the urgency to transition from Russian supplied engines, Blue Origin's design was fairly mature since it was already 3 ½ years into development. Engine component testing is currently underway. The next major milestone will be testing of the turbo pumps and valves. Full-up engine testing is scheduled to begin in 2016. Finally, the BE-4 engine development is fully funded by industry. As a commercial development, we can move very aggressively toward completing the new engine.

Blue Origin BE-4 Engine (Source Blue Origin)

While we expect Blue Origin to succeed, we are also partnering with Aerojet Rocketdyne on a kerosene-based engine, the AR-1, as a backup plan. Aerojet Rocketdyne has a demonstrated

ability to develop and deliver new engine systems. We have full confidence in their technical abilities should the AR-1 be needed.



AR-1 Engine (Source: Aerojet Rocketdyne)

ULA and Aerojet Rocketdyne look forward to working with the U.S. Air Force to define the right level and appropriate contract mechanism to enable critical risk reduction investments to be made to advance the maturity of this propulsion alternative. We have asked our board to invest in this critical national capability.

While for any launch system propulsion has historically been the major cost driver, there are other elements ULA is addressing as part of the NGLS architecture. Another major element of cost in the launch business is infrastructure. Today, we have five launch sites and we intend to move toward having as few as two—one on each coast. We're conducting studies on which launch pads we'll use and what infrastructure is needed that will allow us to make a smooth transition, since we'll potentially have a period of overlap where all three rockets (Atlas, Delta, and NGLS) will be flying. Our goal is to design the infrastructure to radically shorten cycle

time between launches so two launch sites can take on the volume of what is currently done by five.

ULA is not just focusing on the hardware side of the launch system to reduce costs. Another element of the transformation is what we are calling a commercial pricing model. We will honor all our current contracting commitments, while reorganizing the company and begin to transition to more "commercial-like" contracts. This will allow ULA to become much more efficient and provide both government and commercial customers with a much less expensive launch service. ULA's future commercial pricing model, with a standard offering and custom pricing options, will provide the government the flexibility to add or reduce requirements to meet its specific needs for technical reliability, schedule certainty, oversight, and price goals.

Last summer, I was given the responsibility to lead ULA. What I found was a company and supplier base second to none in the world. We have a team that delivers what it promises. ULA and its suppliers have consistently done everything that their government customers have asked of them. We know what it takes to provide assured access to space and when we compete on a level playing field head to head – we win.

It's easy to forget, but 10 years ago many critical new satellite development programs were in serious trouble and way behind schedule. Several key constellations of older satellites on-orbit were operating well-beyond their expected life. National security space was hanging by a thread. The top priority then was to complete the spacecraft and make sure it was ready to launch. On the launch side, we had to be flexible, but always ready to receive the satellites. Once we hit the button the launch **had** to be successful. With fragile constellations on-orbit, a loss in capability from a launch failure would have far out-weighed the cost in dollars to replace the hardware. The Air Force's approach to launch taken over the past decade—which emphasized intense focus on mission success and readiness—was the right approach for that era. The capabilities we have on orbit today are the product of our collective focus on mission success. ULA and the EELV program are a tremendous success.

Looking forward, it is indeed time for a change in the approach to launch. I am optimistic about our plans for the future. We are eager to compete. We are ready to deliver what we're promising.

Thank you. I look forward to your questions.

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