

REMARKS FOR ADMINISTRATOR BOLDEN
COMMERCIAL SPACE TRANSPORTATION ADVISORY
COMMITTEE (COMSTAC)

April 1, 2015

Thank you for those remarks, George [Nield]. In checking with Congressman Fattah's office yesterday to give him a heads up on my planned comments, he informed me that he, regretfully, would not be able to join us for this session today. He asked that I relay his greetings and his continued support for all you do. We in the aeronautics and space community are very fortunate to have a true champion of our cause in his position. His leadership on our subcommittee of the House Appropriations Committee has never been more critical to NASA.

It's great to be here at COMSTAC again. We've had an incredible string of recent milestones for commercial crew and cargo, and one of the most exciting developments in recent space history is the growing maturity of commercial space.

NASA's investment in industry partnerships to reach low Earth orbit is paying off as a critical part of our strategy for reaching Mars.

I know this audience is probably aware of what we've been doing, but let me run over a few of the recent achievements.

Our hard work has enabled the innovation of two American industry partners to carry cargo and supplies to the International Space Station (ISS) for the first time ever. NASA and its partners also have been working to return human space launches to U.S. soil by 2017 and end our sole reliance on the Russians to get to the Station.

On April 13, SpaceX launches its sixth cargo resupply mission to the Space Station. Though in no way can this be considered routine, it's a major achievement that overcomes great technical and physical hurdles every time a rocket leaves the planet. In spite of the set back for Orbital Science in the loss of their *Antares/Cygnus* system last October, they are rapidly working to get back to the task of delivering cargo for us to the ISS. American industry has risen to the challenge of taking on this great service for our nation.

Our partners in the commercial crew effort, SpaceX and The Boeing Company, are pioneers and trailblazers in their own right. They are developing new systems to take our astronauts to low-Earth orbit. It's an incredible testament to American ingenuity and know-how and an extraordinary validation of the vision we laid out just a few years ago as we prepared for the long planned retirement of the Space Shuttle.

But let me be very clear on where we stand. We have put forward a budget this year that is absolutely critical to the success of launching Americans from U.S. soil by 2017. We have two contracts with these companies with exacting requirements and clear milestones. These budget numbers are not estimates, or maybes, or nice to haves. They are based on fairly competed and negotiated, legally executed firm, fixed-price contracts leading to final certification.

We have appreciated the growing support of this program over time, but we are now at a pivotal time. NASA and our partners have provided the knowhow and the plan to bring this capability back to America. The Congress can now choose to fund it or delay.

We couldn't be more excited about the energy and accomplishments of our commercial partners on our journey to Mars.

Commercial space is a key component of our stepping-stone strategy for reaching the Red Planet that includes full utilization of the International Space Station to learn how to live and work in space over the long term, development of new technologies that we'll test in the proving ground of deep space, and new systems like the Space Launch System rocket and *Orion* crew module in which crews will travel farther in to the solar system.

You can see the momentum and progress everywhere.

Boeing and United Launch Alliance recently broke ground on the crew access tower at Cape Canaveral Air Force Base in Florida.

This means the structure that astronauts will use to access

Boeing's space transportation system is now in progress. Boeing is also carrying out water drop tests and air tunnel testing of its CST-100 spacecraft at our Langley Research Center.

A few weeks ago, dedicated astronauts worked outside of our orbiting outpost to help reconfigure the Space Station so the new commercial vehicles can dock there.

Soon, SpaceX will test the launch abort system that will carry astronauts to safety in the event of an emergency at launch.

Sierra Nevada Corp, one of our partners in the Commercial Crew Integrated Capability initiative, is showing off a new thermal protection material next week at NASA's Ames Research Center in California. The new material is called "*TUFROC*," and it will cover the nose and leading edges of SNC's Dream Chaser spacecraft. Part of the *TUFROC* technology advancement was funded through a NASA Commercial Crew milestone.

These are just the most current examples of our progress.

Our goal has always been to ensure that we were launching our astronauts again on American-made spacecraft from U.S. soil safely and as soon as possible and end our sole reliance on the Russians for getting to space.

We are closer than ever to realizing that goal as an integral part of our strategy for ultimately reaching Mars.

This initiative didn't happen by chance. It was the result of hard work, grit and determination by a joint NASA-industry partnership, and it was the result of strong leadership by the President, who refused to accept that the greatest nation on Earth should be dependent on others to get into space.

President Obama led the charge to open low-Earth orbit to private industry.

With the kind of skill and experience that only the NASA team can bring to the table, we worked with American industry to return cargo resupply launches to U.S. soil and now we are working diligently to do the same for our crewed missions.

The contracts we've signed with our industry partners are vivid examples of American innovation at work. We've seen the return of an American launch industry and the insourcing of work and jobs back to U.S. shores. With our private sector partners carrying cargo and astronauts to the International Space Station, we can focus on testing the systems and technologies needed to develop the *Orion* crew spacecraft and the Space Launch System on which it will travel to deep space destinations such as an asteroid and Mars.

Those parallel flight programs are intertwined and essential to all our work going forward.

With the technologies for the future and the inspiration of a new generation of explorers, NASA is ready to take the next giant leap for America and as we do it, we're spurring innovation and economic growth, expanding U.S. leadership in space, and making possible breakthroughs in science and technology.

Make no mistake, NASA's Commercial Crew Program is helping to stimulate the growth of a new space transportation industry available to all potential customers, strengthening America's space industrial base and providing a catalyst for future business ventures to capitalize on affordable, globally competitive, U.S. space access.

We're doing it all right now with the same industrial gumption and innovation that has always made NASA an American success story throughout the world and beyond it.

Last week, we launched American astronaut Scott Kelly and his Russian counterpart, Mikhail Kornienko, to live and work in space for an entire year. It's the first time an American astronaut will have been in space for that length of time. It's an important milestone on our journey to Mars and it will give us detailed medical data recorded throughout the one-year expedition.

President Obama recognized this significant American space exploration milestone in his State of the Union address this year, noting: “[We’re] pushing out into the solar system not just to visit, but to stay...as part of a reenergized space program.”

This mission is part of the critical roadmap we've been undertaking with bipartisan support since the President challenged us five years ago to plan for a human mission to an asteroid and later to Mars.

Scott will not only carry out the research and technology demonstrations that our astronauts have been helping us develop during the past 14 years of continuous human habitation aboard the ISS, he'll also participate in a unique experiment. Scott has an identical twin brother, Mark – also an astronaut – who will be here on Earth. We'll compare the brothers' vital signs and learn how space affects the human body on orbit. Throughout Scott's mission we'll gain new, detailed insights on ways long-duration spaceflight can affect things like bone density, muscle mass, strength, vision and other aspects of human physiology. We'll also look at mental and psychological changes and challenges astronauts may face when they embark on longer-duration missions.

We will also get an opportunity to see how microgravity affects the human genome. This information might affect every one of us on Earth as we get a unique insight into genomic changes.

Next time we launch such a milestone mission for a year to the station, I'm confident it will be from the Space Coast of Florida on the space transportation systems of American companies.

It is my hope that Congress fully funds commercial crew work this year, because it is critical to ending our sole dependence on the Russians as soon as possible.

Our work with industry partners also extends beyond low-Earth orbit.

Building on the success of our partnerships with industry, just this week we selected 12 Next Space Technologies for Exploration Partnerships (NextSTEP) to advance concept studies and technology development projects in the areas of advanced propulsion, habitation and small satellites.

Selected companies will partner with NASA to develop the exploration capabilities to enable commercial endeavors in space and human exploration of deep space. These new partners were selected for their technical ability to mature key technologies and their commitment to potential applications both for government and private sector uses.

Selected advanced electric propulsion projects, for example, will develop propulsion technology systems in the 50- to 300-kilowatt range to meet the needs of a variety of deep space mission concepts. State-of-the-art electric propulsion technology currently employed by NASA generates less than five kilowatts.

We also selected industry partners to help us define the architecture and subsystems of the habitation systems that astronauts will eventually use in deep space.

These selections are intended to augment the *Orion* capsule with the development of capabilities to initially sustain a crew of four for up to 60 days in cis-lunar space with the ability to scale up to habitats we might use for future Mars missions.

One of our partners in the effort to learn more about space habitats, Bigelow Aerospace, is preparing to ship the Bigelow Expandable Activity Module, or *BEAM*, to the Kennedy Space Center soon for launch aboard SpaceX's eighth commercial cargo launch. *BEAM* will then be installed outside the Space Station to help us learn more.

We're also continuing our work with CubeSats and benefiting from their ability to demonstrate technologies and help prove commercial applications in the space environment. The selected CubeSat projects will launch on the first flight of the Space Launch System, known as Exploration Mission-1 (EM-1).

I've been amazed just in the nearly six years I've been Administrator how far we've moved commercial space from science fiction to reality, but this community must become more active in stepping up to fulfill many of the promises of "new space" that have been made over this same period of time. The Obama Administration has done much to facilitate your success, but you must rise to the challenge and accept your responsibility to create the viable low Earth orbit infrastructure that we all believe is possible.

We're out-innovating the world, creating good jobs and advancing human exploration goals, all on our journey to Mars. Our work in commercial space shows just what we can accomplish in this new era of exploration when we work together. I've stood with you and fought with you to get here. We've come too far to turn back and I intend to pick up the pace.

I'll be happy to take your questions.