

Remarks As Prepared For Delivery
By The Honorable Shana Dale
NASA Deputy Administrator
Transforming Space Conference
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Thank you for that introduction Dr. Arvedson.

Good morning and thank you, Andrea, for this opportunity to participate in the Transforming Space conference.

We've gathered to talk about transforming the space enterprise, going back to the future. At NASA, we've begun a year-long celebration of NASA's 50th Anniversary. NASA was created on October 1, 1958, and we've come far in our first fifty years on the new frontier.

About two months ago, NASA Administrator Mike Griffin spoke not far from here, in Long Beach, and he noted that, "We are fully fifty years" into the space age, but equally, "We are *only* fifty years into it."

It's a phenomenal history. On my plane ride from Washington, DC, to Los Angeles, I was thinking about all that NASA's aeronautics research program has contributed to aviation. Winglets, vertical extensions of wingtips that improve an aircraft's fuel efficiency and cruising range, are a NASA aeronautical innovation being utilized around the world on all types of aircraft. Past NASA/industry research collaboration resulted in a new engine nozzle design to reduce engine noise. We are currently developing new concepts, technologies and tools that will reduce noise coming from inside the engine and from various parts of the airframe. NASA also is involved in emissions reduction and alternative fuels research.

In science, we've launched great space observatories such as the Hubble Space Telescope which has let us see the five percent of the universe that can be seen, and shown us that 95 percent remains to be discovered, and the Chandra X-Ray Observatory, which, with Superman's x-ray vision, literally shows us the universe in a new light. We've sent probes to every planet in the solar system. And today, as we participate in this conference, New Horizons is hurtling outbound and nearing Saturn's orbit on its way to Pluto, taking us to the edge of the solar system. The twin Mars rovers, Spirit and Opportunity, whose planned lifetime was 90 days, are now over 1,300 days in operation. Currently, Spirit is in an area called "home plate" to brave out the Martian winter. Opportunity is exploring in the half-mile wide Victoria crater, a window back into Martian history.

In human space flight, Space Shuttle Discovery landed yesterday, completing its mission to the International Space Station or ISS. The docking of the ISS and Shuttle marked an

historic event as ISS Commander Peggy Whitson and Shuttle Commander Pam Melroy greeted each other as the hatch was opened. This was the first time we've had female commanders on duty at the same time, it was momentous, and it attracted popular attention. I couldn't pass up the opportunity to highlight a cartoon in the imagery accompanying my speech – a young girl has decided to shun the princess outfit for Halloween and instead wants a NASA Mission Commander outfit.

This is a good point to thank Derek Wang for the imagery, Lynn Cline for the cartoon, and Rebecca Keiser, my executive officer.

The International Space Station is one of the most amazing engineering and construction projects ever attempted. It also has been one of the most challenging to complete. When finished, it will be more than a microgravity laboratory; it will have added volumes to our collective experience in tackling large engineering challenges in microgravity and it will stand as a monument to determination, perseverance, and achievement.

Great achievements demand great efforts. That was true for those on frontiers of the past, and it will be true for us as we continue to embark on this new frontier. An example of a significant challenge that we recently overcame with the kind of stunning ingenuity that NASA is known for is the repair on the solar array, performed during a spacewalk on Saturday by Scott Parazynski and Doug Wheelock.

Scott and Doug, all crew members, and ground operations crew devised the solution and executed flawlessly – a truly astonishing performance that reminds us why humans are a critical part of the equation in space. In my blog this week, I go into much greater detail about the repair work. The blog is on NASA's website and we're revamping the website which is coming out the end of November or early December.

It's appropriate that we talk about our accomplishments and challenges in this city of dreams and this state of discovery. Since its founding, California has been a place of promise, a place where people are inspired to reach high, to work hard, and to dream big.

A little over 150 years ago, forty-niners and other settlers braved all the hardship of the California Trail in pursuit of their dreams. Today, California is still a place of dreamers and discoverers.

Californians have played a major role in space exploration since the very beginning. In late 1957, scientists and engineers at Pasadena's Jet Propulsion Laboratory were working on a small instrument package which would – on January 31, 1958 – become Explorer 1, the first satellite sent into space by the United States.

That was soon followed by Pioneer 1 on October 11, 1958, which was the first spacecraft launched by the newly-formed NASA. Pioneer 1 was built by TRW. TRW's space operations then became part of Northrop Grumman, located close by in Redondo Beach.

The State of California continues to host a large number of industrial, entrepreneurial, academic and government entities that contribute to space exploration. Last year, NASA obligated over \$3 billion in the state. Funding went to NASA's three California Centers, to contracts with many California-based companies, and to grants at California academic institutions. Additionally, California hosts a robust space entrepreneurial industry.

California gives us much and NASA welcomes the opportunity to give back to California. Recently, we were able to provide assistance during the terrible wildfires that ravaged Southern California.

NASA's Earth-observing satellites helped monitor the spread of those terrible fires. We also sent an unmanned aerial vehicle equipped with thermal-infrared sensors and sophisticated real-time transmission equipment over the fires. This vehicle, named Ikhana, was built by General Atomics Aeronautical Systems, a San Diego company, and obtained by NASA in 2006. Ikhana is operated through a cooperative effort between two California NASA Centers: Ames Research Center in Mountain View, and Dryden Flight Research Center at Edwards Air Force Base. The drone peered through heavy smoke and darkness and found hot spots and flames. It then transmitted the information to the National Interagency Fire Center which distributed the imagery to fire incident commanders over the Internet.

That information gave firefighters a much better understanding of the situation, and aided commanders in allocating firefighting resources. The advantage of using an unpiloted aerial vehicle to fly the sensor and related communications equipment is that it can stay aloft for much longer durations than a piloted aircraft. Eventually, we at NASA hope to have an entire network of sensors which will provide information about natural disasters at every scale, from the ground up to space, aiding responders and hopefully saving lives.

Out of the ten NASA Centers located across the country, three are located right here in California. Every NASA Center will contribute to the Constellation program – the program that will enable humanity's next great era of space exploration. Last week (October 30), new work assignments for the program were announced. And Californians are going to be busy.

At the Jet Propulsion Laboratory, employees and contractors will be:

- Supporting lunar architecture work for Constellation Program system engineers;
- Conducting Lunar Lander project support, including spacecraft design; guidance, navigation and control; life support systems; and avionics; and
- Leading specific robotic surface mobility efforts for surface element communications;

At Dryden, the work will be focused on:

- Supporting mission operations simulation capabilities, and
- Supporting ground and flight test operations for lunar projects;

And at Ames they will be:

- Supporting everything from Ares V payload shroud development to lunar surface mobility, as well as
- Building mission operations simulation capabilities, and
- Leading Ares V integrated health management.

Further, Ames will soon be managing a new Lunar Science Institute. That center will coordinate NASA's research activities for future lunar science missions. The Lunar Science Institute will augment already established lunar science investigations by encouraging the formation of larger, interdisciplinary research teams than those currently at work in lunar science. The Institute is expected to open its doors on March 1, 2008.

These NASA Centers are working hand-in-hand with California's academic institutions and commercial industry. And at NASA, we know that we won't make it to the Moon, much less Mars or beyond, without the innovations and energy, to say nothing of the cost-efficiencies and critical breakthroughs that those of you in the commercial sector in California and throughout the United States will provide.

This includes everything from spacecraft to scientific instruments; ground systems to launch services. That's just the beginning, since going back to the Moon to stay will require establishing an entire infrastructure that supports lunar exploration. Doing so will demand many technology developments, some of which we're aware of, and others that we'll discover along the way.

For those of you who know Mike Griffin and me, you know we are committed to the success of commercial space. A vibrant commercial sector is essential to fulfilling the long-term aspirations of space exploration. But the commitment to commercial space cannot survive on the backs of top leaders alone – because the top leaders of federal agencies have fleeting careers at the helm. It needs to be a philosophy, an automatic way of thinking for the majority of the Agency. That's why I was so heartened to see the new commercial policy from the Exploration Systems Mission Directorate. This policy was not mandated by Mike Griffin or me. It bubbled up from Exploration – a good sign indeed. The purpose of this policy is to provide Exploration with a set of best practices, ideas and concepts which all Exploration activities should be aware of and work to encourage commercial space capabilities.

The goals are:

- To encourage the development of commercial space capabilities and markets;
- To encourage “Buy Commercial” instead of “Government Provided” decisions; and
- To encourage commercial representation and opportunities in NASA's exploration architectures.

The ultimate objective is to encourage the development of commercial space capabilities that can accomplish NASA exploration mission goals at a lower cost and cost risk to NASA through “fixed price” acquisition of commercial goods and services.

Additionally, in the future, NASA would like to have commercial “off-ramps” for exploration facilities and equipment or EFE. This is currently in the planning stages. We may be able to transition EFE to the commercial sector for commercial operation after its primary government use has been completed. NASA would issue a solicitation to identify options for partnership with U.S. commercial entities to develop such a transition plan, and any selected commercial partner would be included at the outset of the design process for the subject EFE.

Not every effort, or every new contract, will succeed. But many will. And setbacks and frustrations are an intricate part of trying new things, of pushing boundaries and breaking through barriers.

I know the theme of this conference is, “Back to the Future.” That is appropriate because of all of the accomplishments of the space enterprise. But I believe we should be thinking of how we are already moving *forward* to the future. We are already there, on our way to the future, on our journey to the next great era of space exploration.

At NASA, we’ve been given the charge and challenge of opening a way of exploration to the Moon, Mars, and beyond. We seek to do this in close collaboration with our international partners and the commercial sector. Unlike an earlier era, we’re going back to the Moon to stay. This is no longer just a vision; it is steadily becoming a reality.

Work has begun on America’s next spacecraft and launch vehicle that will replace the Space Shuttle. Like our Space Shuttle today, Orion and Ares will launch us into low Earth orbit and enable us to rendezvous with the ISS. But they also will allow us to break out beyond this region around Earth and journey to the Moon – a capability we have not possessed since the days of Apollo.

Admittedly, years will pass before Orion and Ares take flight. A gap of almost five years is expected between retirement of the Space Shuttle and flight of Orion/Ares. Almost five years that NASA will not be launching humans into space. But we continue on the path of innovation and discovery.

Quests of discovery are as old as humanity itself. Yet few such efforts are easy. But we keep reaching out again, out of never-ending hope and steadfast desire. We go to see what is beyond the horizon, to test ourselves against the unknown, to face our fears and overcome the challenges using all of our ingenuity and determination. That’s the spirit of exploration. That’s why the space program shows us at our best: dreaming, daring and achieving.

Now Ken Davidian, who is NASA’s Program Director for Centennial Challenges and Lead for ESMD Commercial Development Policy, will join the stage for an exciting announcement...

I am now pleased to introduce the Lieutenant Governor of California, The Honorable John Garamendi. Mr. Garamendi is California’s 46th Lieutenant Governor and a man

who has dedicated more than three decades of his life to public service. During his 14 years as a State Senator and two years in the Assembly, he chaired many committees, but the closest one to my heart is the Joint Committee on Science and Technology. He served as Senate Majority Leader and developed a state agenda for economic competitiveness and scientific advancement. He also served as Deputy Secretary of the U.S. Department of the Interior.

Thank you.