

**Remarks by the Honorable Sean O'Keefe
NASA Administrator
U.S. Chamber of Commerce
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Thank you John (John Bachmann, Chairman, U.S. Chamber of Commerce) for that very, very kind introduction.

I want to thank you again for the opportunity to be here. It's a real honor to be invited to speak to the leaders of the Chamber of Commerce today and to the members of your Space Enterprise Council, in particular to describe and discuss much of what is really an exciting chapter in NASA's very storied history of 45 years. And we're entering in a new phase of our history, which is quite extraordinary.

As this audience knows very well, there are many engines of growth that are fueling our nation's

prosperity and today I'd like to discuss one of them: America's long-term investment in a forward-looking, dynamic space exploration program.

Again, the President's objectives in that regard are moving us in very familiar directions at the same time one's that are quite new as it pertains to this particular chapter in the space agency's history.

I'd like to discuss the President's vision for space exploration, and what it will mean for the future of American innovation and technology development. I think it can be powerful, as we have seen from past history. And certainly the strategy we are developing now can have an incredible effect in this regard.

It is most appropriate that we are having this discussion on this topic on this day in this city as our nation pauses to honor the tremendous legacy of our 40th President, Ronald Reagan.

His boundless optimism about America manifested itself in many ways. Among them was

his energetic and unbridled support for the nation's space exploration program. In so many ways the advantages of where we are today on this agenda, the ability that President Bush has had to build on that is a consequence of his great legacy which was forged two decades ago.

Less than three months after he took the oath of office, on April 12, 1981, the Space Shuttle Columbia launched on its first mission, and after a six-year hiatus, at that point American was back in space to stay. It was a very challenging decision on his part, but nonetheless one we followed through with.

Following the initial successes of the Space Shuttle program, space policy took on a new level of national importance in the Reagan Administration to be sure. In his 1984 State of the Union Address, President Reagan announced, "Tonight I am directing NASA to develop a permanently manned space station...A space station will permit quantum leaps in

our research in science, communications, in metals, and in lifesaving medicines which could be manufactured only in space." A year later he told the American public, "Our second American Revolution will push on to new possibilities not only on Earth, but in the next frontier of space...because in the next decade Americans and our friends around the world will be living and working together in space."

This was 20 years ago that he made these comments.

Today, the International Space Station with 16 partners orbits the Earth as a living testament to the optimism and visionary leadership of this extraordinary leader.

Today, U.S. and Russian crews work together every single day on the Space Station. Gennady Padalka, the Russian cosmonaut, is the commander of Expedition Nine. Michael Finke, is the U.S. astronaut flight engineer. And this has been a

continuing pattern, not a novelty. Every single crew has included U.S. astronauts and cosmonauts in the crew formation. For the last four years we've had a permanent human presence in space for the first time in human history.

Twenty years ago, when he predicted this, in the depths of the Cold War, only the eternal optimist, Ronald Reagan, envisioned this as a possibility. Yet today, it's reality. It's truly amazing.

At that time--when I was working on Capitol Hill and then later in the Pentagon--the very notion of spending any amount of time negotiating with anybody that was part of the former "evil empire" was something I thought I'd never see in my lifetime.

Today as a routine matter of course, our friends and compatriots and colleagues in the Russian Space Agency, work very closely with the European Space Agency, the Canadian Space Agency and the Japanese Space Agency. Absolutely phenomenal

results of what we are able to achieve as international partners, that at the time 20 years ago was considered as nothing more than a pipe dream by someone who admired a shining city on the hill.

Of course, we also remember President Reagan for his eloquent speech on that dark day eighteen years ago when we lost the Challenger and its gallant crew. His heartfelt words did so much to lessen the burden of the sorrow we all felt, and bolstered the American public's resolve to continue this human journey in space.

Indeed so much of what he said then made such a profound impression on all of us as Americans. I must tell you that on the first of February, 2003, they had a profound impact on me in terms of how we should respond and how we should step up responsibly in the wake of the Columbia tragedy that occurred on that day. He set that pattern and it is certainly is one that we like to think we follow.

Fortunately, those journeys have continued notwithstanding the tragedy. And indeed this is an Agency that has been marked by great triumph and great tragedy, and it is known for precisely both ends of those extremes.

I've also learned in my two years at this great Agency that the narrow margin between triumph and tragedy is very, very narrow. These journeys have continued and we are now poised to extend our exploration horizons to a new level. While NASA is a relatively small institution by federal agency standards, with the support of the American people, we never stand pat, and are always striving to find new ways to pioneer the future, and in the process develop cutting-edge technologies that benefit all of us here on Earth.

We are hard at work implementing a vision President Bush set out five months ago for America's

space program to extend our exploration reach throughout this solar system to be sure.

We are tremendously excited about the new exploration challenge that President Bush has given us. He has provided us with a new set of compelling, achievable and responsible goals for the space program. For the first time, as has been argued by the Columbia Accident Investigation Board and almost every congressional oversight committee, we have a focus, a strategy, a direction that is clear.

To demonstrate how clear this is, I'd like to show you now a brief video that highlights the space exploration vision and what NASA will do to implement it.

(Video Presentation)

This has definitely got folks excited around the agency. No doubt about it. Because it is that clear, that focused, that specific in terms of the things we have to do. And it's not about destinations. It's about

objectives. It's about outcomes. It's about specific goals of exploration that are at the heart of it.

And again, the phrase I find most compelling, it is a journey, not a race. We emerged from a race in the 1960's in which the price for coming in second was catastrophic. We had to come in first.

This is about a journey. It's about a whole set of development of capabilities and enabling technologies that permit any of these objectives on an exploration agenda to be fulfilled and as they develop over time the capacity to do so.

But it also has a very significant element that we can capture from that period when it was a race, and that we can now convert to a compelling argument for our journey. And that is the nurturing of a new generation of skilled scientists and engineers throughout this country and the resulting development of new technologies that will promote economic growth over the long run.

Just as it did at that time, it motivated and compelled a whole new range of industry and activity, it certainly can be the same looking forward now.

Along the way, the exciting potential of our space exploration initiative can help reverse a decade long trend of declining interest by students in math, science and engineering fields, and help refresh not only the talent pool but also the broader technology base in this country.

It's already starting. The interest level is already there. Capturing the imagination has already begun. In the last five months, there have been 11 billion hits to the NASA web site: 11 billion. That's beyond the scope of anything any marketer has ever heard anywhere, anytime on anything. That's in five months time. That's a factor of at least four times greater than any web viewing we had last year, when the intensity of interest was already high in light of

the horrific loss of the Columbia. So the interest level is there and it's coming from lots of different strata across the nation. It's not one person with very flat fingers hitting NASA five billion times, it's very broad based participation with as least as we can tell on the order of magnitude of 100 million discrete visitors, most of which are in this country. And there's a stratification based on what we can see from various education institutions, companies and private accounts, it doesn't matter. And it's just across the board in everything we are engaged in. And a lot of that interest is sparked to be sure by the success of the Mars Exploration Rovers, Spirit and Opportunity.

From our self-interested perspective, to be sure, on why this is such a critical factor at this time and this juncture, is the graying of our workforce. I am the average age of Agency employees, 48. There are three times as many NASA scientists and engineers who are over 60 as there are under 30. About one-

fourth of our workforce will be eligible for retirement in the next five years. This longevity has been pretty good, and our retention rate has been pretty good, but there comes a point where folks need to stand back and say, "It's time to go."

Now for a period there were a whole lot of reasons why we didn't recruit a whole lot during the late 80's and all through the 90's. There are all kinds of arguments as to why but nonetheless there is a huge gap as to age gap as well as experience.

And at the same time while employment opportunities in science and engineering are expected to increase at a rate almost four times greater than for all other occupations throughout this decade, the irony is enrollment in science and engineering courses has been in decline.

There has been a 30 percent reduction in interest in these specific science and engineering and technology fields.

Last month, colleges and universities across the United States issued more degrees in sports and exercise science than they did in electrical engineering.

We are losing our technology edge and it's a forecast you could see coming at the same time that we're seeing a real diminution of the talent pool and base within the aerospace community. That's not just at NASA, but across the entire aerospace community where this same demographic and actuarial trend is occurring.

But this has broader national implications as well. A new report by the National Science Board demonstrates the nation is losing "a long-distance race" to maintain scientific resources.

The Board points out that the U.S. ranks 17th among nations surveyed in the share of 18 to 24 year-olds who earn natural science and engineering degrees, trailing such huge technology giants as

Taiwan, South Korea, Italy and Ireland. Now I'm very proud of my Irish heritage, but I sure don't want to be behind them. We're here for a reason, my family is, and it was because it was better than there. And at the same time, we are now losing our edge in a lot of this.

Our best and brightest are being drawn into other professions. A regeneration of our nation's commitment to exploration and discovery I think will help reverse this trend.

As we move forward on our long-term exploration plans we're also putting a lot of effort in reaching out to our next generation of explorers. And educators will tell you that you have to start pretty young.

All of us know people who in college were engineering students, and when it got too hard they transferred into a liberal arts degree. You can name and count on one hand the number of students you

met the number of people you've met who were history major who decided to become engineering majors. If you don't catch them in that middle school, early high-school phase, it's gone. The likelihood of anyone who would want to contribute to the industrial capacity, technology prowess and capabilities, the economic engine of this country...if you don't catch them early in middle school, early high school it's not going to happen in terms of these technical fields: math, science, engineering, technology-related fields.

As we move forward we're quite excited, for example, about a new NASA-sponsored program called Explorer Schools. It's a program we just started a couple years ago that joins educators, administrators, students, and families from 100 middle schools across the country in sustained involvement with NASA's research, discoveries and mission opportunities. We novelly ask the question

to professional educators, 'What do you need to bring your curriculum to life in teaching math and science? We're not professional educators. You are. What do you need...what can we help you do to make this relevant...to demonstrate why what is otherwise a very difficult, turgid some would say set of topics in order to understand how it's applied. And these schools are transforming the nature of the education curriculum at each of these 100 different programs. So we are looking to expand the program over time and also develop in partnership with a lot of different philanthropic and corporate interests to enhance that even more.

I should also mention that thanks to new legislation the President just signed, NASA is beginning a new Scholarship for Service Program, which provides financial assistance to promising undergraduate and graduate students and an opportunity then to work for NASA. So an

opportunity to work on specific fellowship and grant efforts that we sponsor, and then to come work with us in developing those same technologies. In this way, we intend to truly build up the bench strength of the agency, so as not to encounter the same bubble and gap that we are experiencing right now and will experience in the next five years.

We seek to inspire that next generation of explorers through our new class of astronauts who will help carry out our space exploration vision in the year ahead. There are eleven new members, the first class we've announced in four years, who we introduced to the country last month.

They are a remarkable, and typically very diverse group. They include a Peace Corps veteran, a former migrant worker who grew up to be an aerospace engineer, a Navy Seal, and three professional educators who will join with Barbara

Morgan in forming this first initial group of Educator Astronauts.

Now even as we pay attention to assembling the talent pool that will help us get to the Moon and beyond, we are also moving out on the nuts and bolts work of extending our space exploration reach.

Through our new strategic plan, we've already begun investing in the concept of a stepping stone approach to future space exploration activities.

Our plan and the budget also provide NASA engineers and certainly the broader community the direction to develop the enabling capabilities for a successful long-term space exploration program. We know that regular space access can only be achieved by improving safety, reliability and affordability to be sure.

We have indeed accomplished a great deal in NASA's 45 years, but in the greater continuum of

human history, we are just now at the beginning of space exploration when you think about it.

I'm reminded of a remarkable piece that David McCullough wrote-- a historical biography of John Adams, the second President, in which Adams lamented that the USS Constellation, the pride of the new American fleet of ships, that would demonstrate our global commerce intent, our capacity and interest to be a world player as a new nation, laid at anchor in Boston Harbor for days and days at a time because the weather wasn't perfect. It couldn't get underway and couldn't sail.

We're in the same mode right now in terms of space exploration. We've been doing things basically the same way for the past 40 years. We're bound by the same laws of physics, the same orbital mechanics, and the same basic principles of what it takes to get off this rock we love to call Earth and to go anywhere. And we're doing it essentially the same

way. Incrementally better than the way we did it during the Apollo years, to be sure. As a matter of fact, a lot incrementally better. But still essentially the same concept, the same approach. Until we develop new ways of looking at this challenge we are still in the age of sail in space exploration, and have been there now for the last few decades.

To be sure, what we are looking for I think is power generation, propulsion capabilities... breakthroughs that we have not yet conquered that need to be done in order to make this a viable alternative, as well as the human factors research necessary to overcome all the challenges of long-duration spaceflight. We are aspiring in this space exploration venture to the "Age of Steam." But that's as far as we are. In the history of human kind we have only been in this space condition for only a very small fraction of time.

The President's Commission on Implementation of the U.S. Space Exploration Policy, which is chaired by former Secretary of the Air Force Pete Aldridge--and I know he has met, has spent time with the Chamber and the board here specifically-- is helping us plan for Project Constellation...which we named it Constellation because of the historical parallels there, which will bring us beyond that scope of the current limitations we live with and enable us to overcome these challenges in a contemporary way. They will issue their report next week, and we're really looking forward to it. They've spent a lot of time and a lot of influence on the part of many folks representing a very broad based set of communities. There are nine members on that commission who represent the business community, the scientific community as well as a wide-ranging set of backgrounds in acquisition, procurement and a range

of other expertise that will bring this set of implementation challenges to us.

And unlike many commissions that are formed in the nation's capital, we all know plenty of them that get together and everybody debates the size of the table and whether the coffee is hot enough or not, this commission went outside the beltway, they left this 17 mile logic-free zone we call Washington, D.C. and decided to go out and ask people what they think, and they reached out far and wide in an effort to obtain creative and I think very practical ideas for extending our exploration reach. I know that many of your companies testified before the commission and I commend you for your participating in that particular effort and for contributing to what are really going to be some really extraordinary ideas to develop technology, provide economic growth and continue this journey in this way.

The members of the commission focused in their work on the areas of competitiveness, prosperity, science and technology, management and sustainability, and education. Those are the primary areas they really concentrated on: why we should do this in space exploration and why this can be an engine for development.

And in listening to their public statements at the hearings, one of their key recommendations I think that we adopt a "go as you can pay" approach to achieving our exploration objectives.

This subtle phrasing recognizes that we are in a very tight fiscal environment. But then again in my 25 years plus of public service time in and out of government, I have never heard it any other way. There has always been definitionally tight fiscal circumstances.

But encouragingly, we are prepared to reach our goals through a pragmatic budget profile in the years

ahead that basically maintains NASA's share of the federal budget, which is pretty small.

As we move forward there is no reason to turn the clock back to the days of the space race when we expended better than four percent of the federal budget each year of the Apollo program. Today, America dedicates less than one percent, as a matter of fact less than 0.7 percent of federal spending to these research and development objectives, and indeed our five-year budget projection incorporates only modest increases in funding. And it never goes above that 0.7 percent. We can do this within a very limited kind of resource requirement because it is a journey and it is all about developing capabilities, conquering technical obstacles and then building on those achievements rather than pouring a lot of money into something in order to come first in a race. That's not what we are doing.

We will be able to achieve sustainable progress under this budget profile through strategic investments in new space systems. A phase out of the Shuttle orbiter and the redirection of research efforts will provide a cushion to support our new exploration priorities. There is a logic behind this whole profile.

The strategy supporting the President's vision will not require large balloon payments by future Congresses and Administrations. Unlike previous major civil space initiatives, this approach is intentionally flexible, with investments in sustainable exploration approaches to maintain affordability and build on successes as they are achieved, rather than banking on a miracle, a discovery, an invention, or the establishment of the use of some material called 'unobtainium'. It is all about building on capacities we know exist now to develop new capabilities as we move along.

Even after the end of this decade, the budget projections indicate that the overall exploration objectives can be implemented within a budget that keeps pace with inflation and not much more. This is not a trillion dollar program, and I'm just amazed by all the editorial writers who continue to write about that. Actually they've stopped because they've begun to realize that's stupid. There's positively no support for that argument whatsoever. It isn't a fraction of that. And to be sure every single dollar spent on technology development, and every job that emerges from this, every single dollar spent on space is spent right here on Earth. We aren't spending any of that money on Mars. The editorial writers seem to forget both of those points. As a consequence over the next 20 years we aren't even going to approach anywhere near the numbers they are talking about. It's been out there, it's been discussed in that way, and yet they

know better. And at the same time it doesn't sell papers I guess.

Contrasting our nation's R&D investment in space exploration has always been an element of our public policy debate. No one should take this personally or view it as any more remarkable as a historical standard.

Indeed during the 1984 campaign, recalling Ronald Reagan again, there were those who questioned the civil space program then and said it was an absolute waste of time and said we should get rid of the Shuttle and forget this Space Station business and replace it with all the social spending necessary in order to cure our ills. And then once we conquer those problems of Medicare and filling all those potholes, and everything else we need to do then maybe we could talk about doing space exploration. could be canceled and replaced with social spending. President Reagan characteristically

responded, "The American people would rather reach for the stars than reach for excuses as to why we shouldn't." Indeed at that time and it is true today, for every dollar we spend on this, seven dollars is generated in economic activity, technology development, and it has great applications in a wide range of conditions.

The Aldridge Commission has also given a great deal of thought to how we should be organized in order to achieve these objectives. We will be willing participants in implementing their recommendations. We want to get on with this and we are about that business now. We are determined to transform the Agency, and our way of doing business, to put these goals within reach.

And we really do need to look at a different way of doing business. What they have talked about in their public hearings and in their public statements is that we have to adjust the entire way we go about

thinking about what we do and look at defining the space industry in a much more broad way. It isn't the traditional aerospace companies exclusively. It's got to be viewed as a much more expansive approach.

And it's got to start with a simple proposition I found most compelling and logical. And that is: define the outcome what you are looking for and ask the question broadly and you will be amazed at the solutions you will hear about.

We've recently borrowed from this best business practices approach, and undertook a NASA-wide evaluation of our organizational culture and our processes.

Our intent is to build on our organization's many strengths and improve on those aspects of our culture where our aspirations in many ways exceed our accomplishments.

We have begun to make significant organizational changes that will help us accomplish

the goals of this exploration vision. And indeed it will be enhanced dramatically by what the Aldridge Commission will come back with.

Immediately following the President's announcement of the new vision, we established an Exploration Systems Organization, and they will have the responsibility for developing Project Constellation, which will get us out of this mode of constant technology limitations, which once broken, can then open up the exploration agenda much more broadly.

Admiral Craig Steidle, who is now running that activity, is a retired former naval officer who ran the Naval Air Systems Command and who was very much involved in spiral development approaches and managing system of systems acquisitions.

This is a gent who knows what he's doing. We recruited him in to work closely with our Space Science Enterprise on plans to use the Moon to

demonstrate new approaches, technologies, and systems to support sustained human exploration.

Similarly, our Exploration Systems folks are managing the effort to gather robotic options to extend the Hubble Space Telescope useful service life. While a benefit is to keep this amazing astronomy instrument operating, the primary goal of the mission is to develop autonomous rendezvous and docking capacity--an essential technology we will need in pursuit of the exploration vision objectives--and will and has been called out by the Aldridge Committee as an enabling technology. If we demonstrate that here on this mission, we not only extend the service life of an amazing instrument that was designed to cease operations next year...and its still going exceed that well into 2007 or 2008...and also extend it beyond that and develop a technology capability to do this and the request for proposal is out right now.

And the folks who are looking to respond to it are totally different groups of industry players than we've ever seen before. It started a few months ago when we asked: "Here's the outcome we'd like to see. Who has an idea for it?" We received 26 different responses. Some of them were fascinating. Some of them weren't. That's what you get when you ask the question. And the ones that were really interesting formed the basis of a totally different way of looking at this challenge. Instead of something that will be vu-graph engineered for years while everybody thinks about the perfect way to accomplish it, this will be something that will happen relatively briskly, because there's an imperative, there's a sense of need for it, and in it we will develop a technology we've never had before. This is in reach and it's the motivation to do it. And it's a completely different way of looking at the challenge.

Our Space Science Enterprise will also have responsibility for implementing early robotic test beds on the Moon and Mars and will also demonstrate other key exploration technologies--such as advanced power, propulsion, and communications--in missions to Mars and Jupiter's moons. The Enterprise will eventually integrate human capabilities into exploration planning for Mars and other destinations.

Many other elements of the NASA organization will be focused to support this new direction. Our biological and physical research efforts will put much greater emphasis--almost exclusive indeed--on bioastronautics research to enable the human exploration of other worlds, and to tackle those challenges related to radiation exposure, and bone and muscle mass loss over long periods of time spent in zero-gravity.

This is really quite challenging. On a typically mission on the International Space Station over a period of six to seven months it is not uncharacteristic to lose 30 percent of muscle mass, 10 percent bone mass, and receive radiation exposure equivalent of eight chest x-rays a day. If we can't conquer this, we can't go anywhere. So understanding how we reverse those degenerative effects is absolutely essential in order to make this possible. Now the good news is the human body regenerates when you return to Earth. Within a few months, astronauts are back to almost the same condition in which they were before they left. So there are ways to do that. But cracking the code on how to arrest that, will not only have applications for exploration objectives, but imagine a world in which osteoporosis, hip replacements, all these things which are all a consequence of the aging process which we regrettably we all suffer, if there was a way we could

counteract that and describe it as past-tense history because of this technology, that may be an opportunity in and of itself that makes this a noble objective.

It is also worth noting on a management front that we were recently recognized as the first agency to have the highest standard in the Federal government, superior performance in the President's Management Agenda categories of Strategic Management of Human Capital and Budget and Performance Integration." That on top of the finding by the Partnership for Public Service that NASA is the most desirable organization to work for in the federal government, this is really good news. It's kind of a morale boost that we are looking for and demonstrates the depth of commitment and enthusiasm that we have for our agency in pursuit of this.

While it is appropriate to consider the costs and management requirements of a major national endeavor of this nature, it is also necessary to think about the benefits that our pursuit of the vision will bring about.

We are confident that our exploration activities will spur technological developments that will lead to new products and services and tangibly improve the lives of people throughout the world.

Just as the Apollo program led to advances in computing and electronics, the potential spinoff benefits from this broad based exploration program could be considerable.

Since the time of the Apollo era, MRI's, cataract detection, and heart pumps are all derivatives of NASA technologies that have been employed specifically for the purpose of improving our human condition here on Earth.

Every one of them were been brought about in

the pursuit of some imperative. Cataract detection-- know that is derived specifically as a result of our research because cataracts develop very quickly in microgravity conditions. This brought an urgency to our requirements to understand how you detect it earlier to treat that phenomenon rapidly. Radical surgery, all of those things we used to know, in response to the late detection of cataracts is all a thing of the past because of the technology we developed for this purpose.

We believe the technology development necessary to execute and implement the president's vision will accelerate advances in robotics, autonomous and fault tolerant systems like the Hubble servicing mission approach, human-machine interface, materials, life support systems and novel applications of nanotechnology as well as microdevices.

Let me just say as the President has stated, we intend to promote commercial participation in this bold exploration agenda to further U.S. scientific, security, and economic interests. That is an essential element of what he directed, as part of the presidential directive.

While we will no doubt be working with the traditional aerospace industry as this journey unfolds, again much as the Aldridge Commission has observed, we must reach out to a wide array of businesses to tap new ideas and concepts. And that's exactly the approach we are taking. We ought to do a whole lot more of it.

Many of you may very well play a meaningful role in helping make this great exploration adventure possible. With a little imagination there are multiple products or services that will contribute to our unfolding space exploration activities.

In turn we believe the technologies we will develop might provide new business applications in numerous unanticipated ways as has been the history for some time.

Now to help spur these new technologies we are doing something quite refreshing in our industry outreach efforts. Through our new Centennial Challenges program, we are establishing a competition to stimulate private sector innovation in new space and aeronautics technologies, assuming the Congress agrees.

I know one thing that gives all of us I think, or should, I hope. And that is that young folks, this next generation of explorers, are positively thrilled by this. It is something that every time gets a reaction that's overwhelming. This same group of future explorers are the ones who react to a lot of the things that you just saw, with renewed enthusiasm and a different focus on math and science education, and in

turn, they will be the ones to help head to the cosmos, and that they may well be among the first explorers on the surface of other planets.

The President has described this promising vision for our future in space. But he has described it as this: right after the Columbia tragedy he used a term that I thought was particularly descriptive that captures the sentiment when he has said, "Exploration is not an option we choose, it is a desire written in the human heart."

Indeed throughout the course of human kind, all great advances, all great achievements have been the result of our willingness and temerity to want to explore and discover and understand that which we don't know better. And every time when there's been a material change and we discovered things we never set out to understand because it just happened as a result of our pursuit; serendipity plays a big role in these things, and that's part of what we are engaged in

as a deliberate focus but also a willingness to adapt to those developments that you didn't expect to see.

We are just at the beginning of this journey, we are looking for to this age of steam. We look forward to working with all of you in the industry and the broader community as it takes us to heights unimagined and into frontiers unknown if we treat it in that way.

Once again I thank you for the opportunity to speak this afternoon, thank you very much.