

**Remarks by the Honorable Frederick Gregory
NASA Acting Administrator
Continuous Improvement and Quality
Management Conference
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Thank you Bryan (Bryan O'Connor, NASA Chief of Safety and Mission Assurance) for that gracious introduction and good morning ladies and gentlemen.

I've been looking forward to coming to this conference for some time and for a very specific reason.

When I suited up for my three Shuttle launches, I very much wanted to look in the eye every person who had a role in assuring the success of these flights and sincerely thank them for their dedication and commitment.

Let me do that right now. I am truly grateful for the opportunity to represent my country in spaceflight, and for all that so many of you did to contribute to the success of those missions.

I'm certain that my fellow astronauts here today—Brian O'Connor, Nancy Currie, Bill Readdy, Roy Bridges, Jan Davis, David Low—share the same sentiment.

Today, I appreciate all that you are doing to prepare for the safe flight of the Space Shuttle Discovery on the STS-114 mission.

I am grateful for your unstinting efforts to help raise the safety bar in all of our mission activities.

I also welcome your participation in this conference, which provides a tremendous opportunity to stimulate creative thinking about how we can get our arms around the complex subject of safety and risk mitigation.

Usually, a conference having this subject wouldn't draw much attention. But in the aftermath of the Columbia tragedy I can assure you that people are closely watching every step we're taking.

This is no ordinary time for NASA, and the upcoming mission of Discovery is no ordinary flight. The bottom line is we've got to deliver. The future of the Agency depends on it!

We are now exactly 10 weeks away from the scheduled launch of the STS-114 mission on May 15th. Let me underscore, as we've said all along, we will not fly until we are confident that we are fit to fly. But certainly the time when we will be able to make that decision is drawing near.

Eileen Collins and her crew have trained very hard for our return to flight, and they are indeed counting on your continued good work.

Early yesterday morning, we mated the External Tank and Solid Rocket Boosters to Discovery.

Also yesterday, our Russian partners launched a Progress resupply vehicle to the International Space Station that contains some digital imaging camera equipment that will help us in viewing the Shuttle orbiter for potential damage when it approaches the Station.

Today, at all of our operations centers, NASA and contractor personnel are conducting a full-scale dress rehearsal of various contingency situations involved in a launch and a mission.

This is the kind of training that will allow our people to really operate at peak potential during an actual mission.

Coming up, on March 18th we will have rollover, the movement of Discovery from the Orbiter Processing facility to the Vehicle Assembly Building. And then on March 25th, we will rollout the Shuttle to the launch pad.

Meanwhile, I look forward to traveling to Kazakhstan to view the April 14th launch to the International Space Station of our Expedition 11 crew—Sergei Krikalev and John Phillips—along with Roberto Vittori, who will briefly stay on the ISS. That launch will occur April 14th Eastern Time, but April 15th over in Kazakhstan.

During Expedition 11, Sergei and John will support the arrival of the STS-114 crew on this all-important demonstration that we can safely return to flight and move on to meet the first goal of the Vision for Space Exploration, completing Space Station assembly.

Also in April, I plan on a return trip to Kazakhstan to greet Expedition 10 crew members Leroy Chiao and Salizhan Sharipov when they return to Earth after their very successful six-month mission on April 24th.

So we definitely have a full plate of activities on our hands.

To be certain, delivering on the solemn promise we've made the American people to fix the problems that caused the Columbia tragedy two years ago and do everything humanly possible to ensure the safe resumption of Shuttle flight operations involves significant technical improvements.

Many of you have worked hard on the sensors and cameras that will be focused on the Shuttle stack when Discovery lifts off.

Others have performed exemplary work to significantly decrease foam debris hits from the External Tank to the Orbiter during the liftoff sequence. We have developed new techniques for non-destructive evaluation of the External Tank on the ground and rigid process controls for spraying foam on the External Tank.

During the mission the crew will test out various methods for repairing foam damage if there is any. I thank those of you who have worked on meeting this challenge.

As we move forward working 24/7 up to the STS-114 mission—and remember we haven't yet fully completed the Stafford-Covey process—we must also acknowledge that in this business you are never just flying the last mission.

So as much as we need to pay attention to the issue of reducing the potential of foam damage from the External Tank, on this and on subsequent flights we must continue to be on alert for the many other things that can go wrong in spaceflight. And I know every member of the team has this mindset.

I'm very pleased that we also have new institutional tools to help us fly the Shuttle and all our missions more safely. For example, Al Diaz, our Science Mission Directorate did a great job with his

Committee that looked at 40 specific ways we could implement the safety recommendations of the Columbia Accident Investigation Board across the Agency. We're going to receive a progress report next week on how we are doing implementing the Diaz report.

As many of you know, the Diaz Report focused on the organizational causes identified in the CAIB report and made specific actionable recommendations related to leadership, learning, communications, processes and rules, technical capabilities, organizational structure and risk management. The Diaz report is also on our web site and I commend it to your reading.

Let me now turn to our Independent Technical Authority. In January, I had the honor to speak before NASA's first group of Technical Warrant Holders. These folks are truly pioneers in a vital effort to bring engineering excellence for safe and

reliable operations to bear on NASA's programs and projects and technical disciplines. We look forward to adding more talented engineers to this prestigious group.

We're also getting great production out of the people staffing NASA's Engineering and Safety Center out at Langley. Within its first year of operation, the NESC has demonstrated its ability to perform independent, in depth, value-added technical assessments, analyses and tests. The NESC has made Shuttle and Space Station safety a priority, but has also taken on requests for involvement from all across the Agency, with many of these requests having come from groups outside the agency, which is truly gratifying. I salute Roy Bridges and Ralph Roe for their commitment to making NESC a showcase organization for the entire government.

I want to emphasize, however, that as good as we are at taking a more rigorous view toward safety

issues and talking through potential safety issues during flight readiness reviews and actual missions, we can and must do a better job of communicating with each other. That's what the Columbia Accident Investigation Board told us, and that's what this conference is all about.

Let's consider for a few minutes the cliché of thinking outside the box. At a basic level, thinking outside the box refers to a pattern of thought that engineers aren't used to expressing: thought based on intuition, hunches and gut feelings that may not necessarily be based on hard data.

Of course in mission decision-making, we must begin inside the box, with analysis of actual facts and figures. But we must learn not to exclude outside the box thinking or opinions that suggest there may be more than one way to look at a situation.

Let me give you an example of this kind of thinking. All of us recognize the missions of our

Mars Exploration Rovers as a tremendous accomplishment. But while we celebrate what these two robotic pathfinders have achieved, we tend to forget that for several days last January we faced the gloomy prospect that Spirit had essentially gone to sleep on the Martian surface.

When this happened, a team of dedicated JPL engineers began a heroic two weeks of problem solving. During several days and sleepless nights Jim Donaldson, the leader of the Mars Exploration Rover Avionics group, along with Glenn Reeves, Tracy Neilson, Jennifer Trosper and their colleagues stayed focused on creatively solving the problem.

On Spirit's 21st martian day, the team coaxed enough data from Spirit to show a pattern of something that had gone amiss with its computer. With very little to go on the team deduced that Spirit's computer was rebooting over and over.

There was nothing that drew them to this conclusion other than educated guesswork.

Using the mission's rover testbed at JPL to check on brainstormed ideas, the team diagnosed that Spirit was having difficulty using its flash memory. They figured a way to bypass use of the flash memory and nursed Spirit back to health. Spirit was finally restored to normal operations on the mission's 32nd martian day. Today, on its 413th martian day, Spirit is still going strong.

And we can credit Jim Donaldson for having the insight to tell his team, "Put the pen down, and step away from the whiteboard."

To his credit Bryan O'Connor is also looking for better ways to communicate and solve problems. He told me that he's been reading a book by Malcolm Gladwell called "Blink: The Power of Thinking Without Thinking." This book is about the first impressions people have about situations, that based

on past experience leads them to sense danger, or react to a new idea.

Gladwell's point in this book is not that hunches or intuition are full-proof. Yes, people can be in error when they leap to conclusions. Rather, the book makes the case that people need to pay attention to, talk through and not immediately discount thoughtful expressions of opinion that are not immediately derived from concrete data. Again, put the pen down, and step away from the whiteboard.

Gladwell, incidentally is the author of another book called "The Tipping Point: How Little Things Can Make a Big Difference."

I need not remind everyone in this hall that during the Columbia mission some folks thought the debris strike to the Orbiter was a "little thing." That strike was indeed a tipping point with catastrophic implications.

So how is NASA working in a formal sense to improve the ways we communicate with each other?

One means by which we've attempted to do that is through the process we initiated a year ago by hiring Behavioral Science Technology, BST, an organization with a long track record of helping organizations to achieve safety excellence, to guide us through this process of organizational change.

BST's goal is not to dictate how we talk to each other, but instead to provide us with the expertise and the tools to help us guide our own destiny.

They came on board with the goal of helping us to eliminate barriers to a high performing safety culture and mindset; facilitate collaboration throughout the NASA workforce; and align with but not duplicate the efforts of One NASA and Return to Flight.

A year ago in February, BST conducted a NASA-wide Safety Climate and Culture Survey.

Paired with the survey was a review of existing documents, interviews with employees and focus groups.

The survey found that while NASA has many strengths, including how we scored on teamwork, work group relations, approaching coworkers about safety concerns, and reporting incidents or deviations that affect safety, we do not always lift ourselves up to achieve the high aspirations we have in terms of our espoused core values of Safety, People, Excellence and Integrity.

The survey alerted us to the fact that open communication is not yet the norm, and many people still do not feel fully comfortable raising safety concerns to management. We must overcome this barrier to enhanced mission safety. It is a barrier as tangible as any fence you run across while hiking in the countryside.

Now using the survey results as a baseline, last spring BST assisted our folks at the Glenn, Stennis and Johnson Centers in implementing a group of activities designed to nourish true culture change.

BST also conducted limited training for the Safety and Mission Assurance Directorates at Kennedy and Goddard.

Last September, the climate and culture survey was administered again to the groups we've been working with, measuring 11 scales related to organizational functioning and safety performance. I'm pleased to report we are showing measurable progress.

Building on our initial momentum, we've expanded this work across the Agency. Many of the NASA employees present here today will soon be participating in executive assessment and coaching

and team effectiveness training. Contractors at our Centers will also participate.

Those of you who take part will learn new skills for working with your colleagues to seek out honest, thoughtful expressions of opinion.

It is my sincere hope that our work to listen and to collaborate more fully with our colleagues at all levels will also have the complementary value of assisting the development of the crucial next generation of leaders for NASA. These are the people who will be in charge when Spirit and Opportunity are joined on the Martian surface by pioneering astronaut explorers several years hence.

Thus far, I've mentioned our immediate challenge of returning the Shuttles safely to flight. But we also need to consider the long-term challenges our transformed NASA will have in

implementing the objectives of the Vision for Space Exploration.

Make no mistake about it, NASA's efforts to advance the Vision are well underway.

Yesterday our Exploration Systems Mission Directorate, led by Craig Steidle, issued a request for proposals for the Crew Exploration Vehicle, the spacecraft that will carry astronauts beyond low-Earth orbit to the Moon. This September, we will select two final contractors to take us up to a demonstration test flight in 2008.

In the April-May time frame we will also release a draft request for proposal for Crew Exploration Vehicle Systems Engineering and Integration Services, with a formal proposal to be released in June and final award to come in the December-January time frame.

On March 11th, Exploration Systems will host an Industry Day at the U.S. Commerce Building to

inform potential contractors about procurements on the horizon.

Our Science Mission Directorate, led by Al Diaz is also busy. On March 8th they will host an international workshop on science opportunities under the Vision.

As we move out to achieve the goals of the Vision, we're transforming our entire organization to better align ourselves with the skills and resources we will need to conduct a long-term, sustainable program of space exploration.

We are taking a hard look at everything it will take to turn the goals of the Vision into reality. We're assessing whether parts of our facilities are out of date, whether we have the right skill sets and core competencies in our employees, and whether our Centers are structured to be more innovative and productive.

In the future, I envision NASA Centers creating partnerships with a variety of contractors and universities based on the unique skills sets and competencies that everybody brings to the table. These relationships in turn, will place a greater premium on the kinds of thing that we are talking about today at this conference: enhanced communications, and a more sophisticated understanding of safety requirements and risk reduction and mitigation elements.

In a few moments we are going to hand out NASA's Quasar Award recognizing quality and safety achievement with respect to NASA products and services. We will also be recognizing some outstanding achievers with the George M. Low Award, NASA's premier quality and performance award for our prime contractors and subcontractors.

And let me tell you, I was extremely honored to follow in George Low's distinguished footsteps in becoming Deputy Administrator three years ago.

Both awards represent the across the board excellence that we are trying to achieve when it comes to safety and mission success.

The linkage of these two elements--safety and mission success--is demonstrated by the remarkable life of the distinguished gentleman whom the second award is named after. And I am very gratified that George's son and my fellow astronaut David Low is here with us to share in this special occasion. Dave, please stand up and take a bow.

In closing, I thank you again for the opportunity to speak to you today about NASA's determination to set the gold standard for safety and quality.

As we continue our diligent efforts to safely return the Shuttle to flight and to conduct our other activities with organizational excellence that is

second to none, I applaud your commitment to take on the most difficult assignments and your dedication to our transcendent work to extend the reach of human civilization throughout the cosmos. Thank you very much.