

NASA HEADQUARTERS ORAL HISTORY PROJECT

EDITED ORAL HISTORY TRANSCRIPT

SEAN O'KEEFE
INTERVIEWED BY REBECCA WRIGHT
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WRIGHT: Today is March 21st, 2013. This oral history interview is being conducted with Sean O'Keefe in Herndon, Virginia for the NASA Headquarters Oral History Project. Interviewer is Rebecca Wright, assisted by Rebecca Hackler. Mr. O'Keefe served as the NASA Administrator from December 2001 to February 2005. He currently is the chairman and CEO of EADS North America. Thanks again for finding time in your very busy schedule with us.

As we were discussing, there's been much written since your departure, and even while you were still at NASA, about the leadership that you showed during the days following [the Space Shuttle] *Columbia* [STS-107 accident]. Also, much has been discussed about the decision not to send a Shuttle mission repair trip to the Hubble Space Telescope. However, today we'd like to talk to you about a line in the bold Vision for Space Exploration announcement that is actually impacting some of what NASA is involved with today. That line is the very last line of the list of actions, which said to "pursue commercial opportunities for providing transportation and other services supporting the International Space Station and exploration missions beyond low-Earth orbit."

After the Vision was announced, there was a group commissioned to study the Vision and help find ways to make it become a reality. In that [Edward C. "Pete"] Aldridge Report [The President's Commission on Moon, Mars, and Beyond], it even went so far as calling for a very robust space industry, and stating that it could become a "national treasure." Could you give us some background and some insight of why this last line was included in that Vision?

O'KEEFE: There was just one fundamental reason. The makeup and the composition of what NASA is all about, what its mission is all about, leads you to conclude that if others could do what NASA is doing, then NASA ought to turn it over to them.

NASA is an exploration agency. It's all about research, development, technology introduction and insertion. If you do things in multiples, you've got to wonder why NASA is doing it. That's one of its fundamental greatest attributes. This describes the paradox of what the agency is all about since its founding. NASA does things that no one else is doing. The idea is to demonstrate they can be done, and then turn it over to those who could do it on a repetitive basis. Catch is, the government assumes all of the extraordinary risk that goes along with development.

That's what has defined the agency since its beginning, the amazing capacity to do things we considered improbable. It's the paradox that with so many different high risk ventures having been taken on, the success has been as great as it has been.

It's further testimonial to the fact that if you did not have a dedicated group of public servants who are completely absorbed and motivated by the proposition that this is an unthinkable, unheard of, or not achieved objective.

Once done, history and the pattern of development of things and inventions and innovations, all these, the history in every one of those instances is that there's a different skill set required to take on bold exploration efforts, and development projects than it takes to accomplish efficient, cost effective, repetitive functions.

If you look at any invention, any innovation, any discovery, it is replete with exacting parallels. It takes a different focus, different mindset, the first of which has to be very

entrepreneurial in order to achieve that goal, and willing to assume extraordinary risk to do so. But at the same time, responsible risk, and ones at least you can determine the scope of the risk. Not just completely reckless in mindset. It's got to be something that is determined to be an achievable outcome with extraordinary means and capabilities to achieve.

That's a different managerial leadership challenge of people, of capabilities, of assets, of all the things you need to motivate an organization to achieve, than the managerial focus of how do I take this design and do it on a repetitive basis exactly the same every time. That takes a very different kind of focus on efficiency, on process, on delivery, on cost, on schedule, all the basic fundamentals that it takes to make sure you're satisfying a demand.

That very subtle line at the end [of the Vision of Space Exploration announcement] is in some ways descriptive of what NASA is all about. Having achieved the goal of building the ISS, having built what amounts to the eighth wonder of the world, a laboratory in space the size of two football fields and operating continuous 365 [days a year], 24 hours a day, 7 days a week—okay, done, it's accomplished. Now you got to figure out how to support it on a repetitive basis.

That's something that can be transitioned and becomes the basis of a demand for a different kind of enterprise. It could be commercial, could be nonprofit, any number of different ways. But it doesn't necessarily mean and imply that you need the skill sets of an entrepreneurial organization that is pressing the boundaries of what's feasible. We've already done that. Now it's a matter of figuring out how to do this on a repetitive, efficient, cost-effective and achievable basis. A totally different set of managerial skills. Trying to organize all of that into one agency that is dedicated first and foremost to doing things that really press the edges, the boundaries, that's a different objective than continuous, repetitive support efforts.

This [line] was in many ways a manifestation of the very mission statement of what this great agency is all about. Once having accomplished an objective, figure out a way to transition it effectively to those organizations, those entities, those companies, whatever they may be, that can then perform that mission with great effectiveness and efficiency over the long term to support the accomplishment of this great technology venture. That's what that was all about.

Having done so, commercialization seems to have started. It's beginning to get there, but it's a little slower getting there than I think anybody had anticipated 10 years ago. But that's the nature of these challenges as well. There's always permutations of how long it takes for things to occur.

If you look at the parallels in commercial aviation, it took the formation of NACA [National Advisory Committee for Aeronautics], one of the predecessor agencies of NASA, to develop a capacity to actually accomplish on a regular commercial basis the means for commercial flight. Just looking outside this window, we're looking at [Washington] Dulles [International] Airport [Virginia], in which thousands of flights a year are launched and landed at that location. When the Wright brothers did what they did and when Orville [Wright] sat on the NACA committee for all the years he did, he would have never imagined this as feasible. This was something that only millionaires could do. Sound familiar?

It took an extraordinary amount of investment, time, and energy in order to make commercial flight possible. That's how the commercial, aviation industry began. It was started for only the very wealthy who could afford. Sounds an awful lot like paying for rides to the International Space Station today, compliments of any number of different billionaires out there who want to go out and develop that as an enterprise. Great. That's how it starts, that's how it goes.

Much as I admire the Burt [Elbert L.] Rutans of the world and all the folks who are out there thinking in terms of how to do this on a commercial basis, what they're doing is the second step. They're trying to figure out how to do it on a repetitive basis, which is a substantially different venture than the first effort, which is: how do you get there in the first place, how do you motivate people to want to go test what is fundamentally an unknown, of which you have a limited number of knowns about what that unknown could yield, and are willing to take that risk, willing to take on those challenges, be adaptive and flexible enough to make changes in order to achieve it, and then once done so, the challenge in the second stage is how do you make it possible to do regularly, available for anybody to accomplish. We're getting closer to that goal.

WRIGHT: When you walked in the door, part of your task or challenge of course was to get your hands around that ever increasing budget for the [International] Space Station. You knew that you already had financial issues.

O'KEEFE: Huge.

WRIGHT: Then the *Columbia* tragedy happened just a year after that. There was some evidence prior to your tenure of devising a more broad commercialization policy. Were you aware of that, and then took a step from that? Or were you thinking more of a different way of getting commercial folks involved?

O'KEEFE: Again the school of thought I just described and defined is one that is a well trodden path of any example or case of innovation, technology advancement, discovery. Any number of

things where you've opened up a fundamentally new market by doing something that is breakthrough. What was being discussed at the time I walked in the door at NASA about commercialization was the fairly straightforward and common exercise that goes on across the entire government at any level, whether it's federal, state, local doesn't matter, of what is it that we really ought to be doing as a public enterprise, and what should be contracted out or commercialized instead, what is it that is inherently governmental.

This is a standard school of thought that is deep in my background from the time I was in graduate school of arguing what is a public good and how do you define the objectives of what the government should and shouldn't do. It turns on the question of how we define ourselves as Americans fundamentally or any nation state to determine how we provide for the citizenry. This was one of those exercises, the commercialization effort that was under way—I don't want to call it pedestrian, but it was fairly straightforward. It was a recognizable exercise of trying to determine how best to perform an activity, a known, given, established, defined activity.

What's talked about in the Vision statement is something totally different. It was the first case of how do you effectively transition from an organization that's dedicated to being a technology development breakthrough entrepreneurial enterprise and move it out of that mode and into something that accomplishes it on a repetitive basis, once you've created a market demand for it. That also has great parallels to just standard evolution of technology development activities. Much has been written about this. Any individual change that occurs, you find this transition that takes different organizations to do.

It's one of the greatest things that most companies wrestle with. How do you foster a duality within your corporate enterprise, if you're big enough and address market diversity and breadth far enough, to establish the means to accomplish a task and deliver a product or service

that by definition has to make money or you won't be doing it very long, and at the same time support an endeavor that is always looking towards the next development of what you can do?

It's a tremendous challenge. Every company confronts it. Business schools are dedicated to the task of trying to understand how you make that transition. In every successful corporation you can trace an evolution of how they morph over time, depending on what stage of development they're in. Steve Jobs [co-founder, Apple, Inc] didn't suddenly walk into someplace in Palo Alto [California] one day and say, "I'm in charge and now we're going to start making iPads." No, this was he and all of his colleagues at the time doing this out of a garage. [David] Packard, [William R.] Hewlett and all these guys did these things on a shoestring [budget], but it developed into something.

The notion behind NASA though was, it always is to be dedicated to that public garage, if you will, of trying to figure out how do you go establish that breakthrough capability, or achieve an outcome that is considered unachievable right now. What is it going to take in order to make innovation happen? The task is not to figure out how to morph NASA into another kind of agency. Rather, the challenge is how to then transition the innovation effectively to some means to execute it on a regular basis. Then NASA moves on to the next great challenge to achieve exploration.

Again what was occupied at the time I walked in was very much towards the basic fundamental challenge that I think has been in modern public administration and public governance to determine what is inherently governmental and how you sort the laundry of what's done in one place versus another. Now this turned into something totally different.

WRIGHT: Of course when you walked in the door you didn't know 18 months or so after that you would be negotiating with the Russians to take on the task of not only delivering supplies to the ISS, but being the only way to get the astronauts there. Can you talk about those negotiations, and if at all did that make you start to think that you needed some type of other way of getting goods and supplies and crew to the Station?

O'KEEFE: You've defined it exactly right. The method that we had devised well before my time, but we collectively within the NASA family, devised on Station was to use the Space Shuttle as the means to not only construct the ISS and rotate crews, but also resupply the ISS on a regular basis.

The Russians, up until February 1st, 2003, were responsible for more regular flights of two varieties. One was the Soyuz space capsule which was sent up every six months for the purpose of changing out the emergency escape module that would be always attached to the International Space Station in the event of some destabilizing condition which made it no longer habitable. As a consequence the crew could then board the Soyuz and exit the Station with some very high assurance of returning to the surface of the Earth promptly. That was possible, given the impressive track record that the Russians had established with the Soyuz program.

More frequently were the Progress vehicles which were sent up in the range of four to five logistics flights a year. The Progress is essentially the Soyuz capsule not pressurized and used for cargo and resupply for perishables. Because the Space Shuttle flights to Station occurred in a span typically of anywhere from four to six times a year, sometimes a little higher, sometimes a little lower, depending on the events of the year, it would dominantly be components, modules and segments of the Station to be assembled. Now there were some

logistics capabilities and cargo capacity that was still left over in the Shuttle bay that was utilized for that purpose as well.

The Progress vehicles were a reliable methodology for sending resupply of perishables on a regular scheduled basis, and the cost to achieve was minuscule by comparison to that of Shuttle flight. It was not comparable. Capability was also not comparable. Again if memory serves me, and I stand to be corrected on this, but my memory is that Progress vehicles at best would accommodate no more than 20 to 25 percent of the payload of what a Shuttle flight could accomplish. You got to do several Progress flights to equate to one Shuttle flight for cargo needs. There were all kinds of size and weight restrictions as well. Anything that required a component replacement or equipment change out, anything that really was sensitive at all required the Shuttle to transport it. Pre-*Columbia*, Progress was sending up groceries, expendables, things that basically if you lost it for whatever set of reasons, everybody would call it a bad day, write it off, and say, "Well, let's go repack it and send another one." It was hardly ever utilized for very sensitive or very time-sensitive material.

The nature of the negotiation after February 1st, 2003 was on two fronts. First of all, to step up the number of Soyuz flights, in order to keep the crew exchange as robust and as consistent as it had been. We conducted exhaustive studies of what it would take to do "lights dim" on the Station, abandon it for extended periods of time and let ISS operate uninhabited. This posed some really challenging problems.

Not having a human being aboard continuously creates some difficult engineering and technical issues that forced us to come to grips with the reality that we needed to keep a crew aboard Station even if it was a more modest size crew of two at minimum, three if we could, on a regular, continuous routine basis. Otherwise, we risk significant degradation challenges to

maintain altitude, condition, operations, and if there were any kind of equipment failure that in turn would compromise the capacity of Station to stay in orbit

For all those reasons, it backed us into the answer that we had to keep a continuous crew present aboard 365/24/7. There was no viable choice than to negotiate with the Russians to step up the number of Soyuz flights, and to increase the number of Progress flights, in order to accommodate and figure out how we would fit many of the sustainable components you need in order to change out equipment into the Progress vehicles. That became a limitation in and of itself.

Anything that didn't fit the size of Progress, which is definitely much smaller than Shuttle, you had to figure out a different way to work it. This was a drawn out Apollo 13 type problem. How do you deal with what you have? Fortunately, we had more than the short time frame the Apollo team had. We were able to map this over weeks and months rather than try to do it in a matter of hours with duct tape and baling wire. But it was not far afield from that same analogy, because there were space, weight, cube limitations of what you could put on Progress, despite your desirement. I don't care how much you want to do it, it can't get there with what we had. That became a factor of discussion as well in terms of how many flights, what frequency, what material and cargo and manifests would be scheduled for the regular Progress flights.

I've got to say in terms of the nature of those negotiations, it would be an understatement to say anything other than the Russians demonstrated an extraordinary commitment to the International Space Station alliance, the partnership, far beyond what anybody anticipated. They were really remarkable. They put a lot of energy and time into it, a lot of pride. One of the things I learned before *Columbia* was lost was the depth of national pride as well as competence

that the Russians exerted in their efforts. Their method of operation is different than ours, very different. That could be the topic of a whole discussion in and of itself because the differences are absolutely stark. It's unmistakable in terms of how they do business versus how we do business.

That said, what is absolutely the same about them and us is an extraordinary dedication to this amazing venture of exploration. They're good, they're durable, they are persistent, they are completely dedicated to the objective. There's never a case in all of the interesting, challenging discussions with the Russians over many, many issues that I ever had any problem whatsoever reaching a very clear understanding – they with us and us with them – that here's the objective, here's what we define it to be, this is the outcome we want, this is how we describe success. How to accomplish the objective was always the subject of debate.

They frankly, I think, viewed it as a responsibility to step up to the challenge to be the singular nation state and member of the partnership to continue to support Station during that challenging interregnum period. They knew it. They accepted it as a responsibility. They viewed it as an obligation. They were extremely professional about how they did that. I just could not have been more impressed or more grateful to them for the manner in which they did this.

The director-general of Roscosmos [Russian Space Agency] at the time was [Yuri] Koptev. He was right out of Central Casting—he looked and talked like just what you'd expect from a Hollywood production when casting for a Russian running the space agency. If one were asked, "Find me someone who fits the public perception of a Russian explorer and that would be Koptev." He had a commanding presence, was a remarkably dynamic leader in his time, and really stepped up to the job in a way that was pretty impressive.

His immediate successor was former military and an equally dedicated man, Anatoly Perminov. Their transition occurred during the Shuttle grounding period. Koptev had been the director-general for at least a decade before I ever arrived. He'd been around quite some time and was an institution in his own right. But his successor was equally dedicated to the task and didn't miss a step. There was never any issue of his authority over Roscosmos.

That said, both viewed support of ISS as an obligation and responsibility on the part of the entire International Space Station alliance to help support the Russians in their endeavors to keep the station operational. That posed a rather interesting set of discussions and negotiations on how that would work. They attempted on many many occasions to try to leverage an opportunity for more resources, more support from all of the alliance partners, particularly from the United States. We had some very spirited debates about that. In the end, each time they said, "Well, we may not be able to conduct this Progress flight or this Soyuz flight," my response to that was, "then that is an interpretation that you are abandoning your obligation." I argued that they would think the US abandoned our obligation to permit international crews aboard Shuttle if we failed to fly Shuttle if we could.

Well before the *Columbia* accident, flights included members of the Russian cosmonaut corps and assets that were sent for segments of the Station that were Russian modules like Russian laboratory segments and equipment. We never questioned the Russian manifests. We never argued with them about whether or not it should or shouldn't go. It was all a question of sequence, timing, when the right crew members would be scheduled, and we never sent them a bill for the cost. This was the US operational contribution and we bartered for several Americans. This was part of how we defined ourselves as partners.

This was a regular conversation that was a little more animated than the way I've just described it. Nonetheless you take the point. It was just a reminder, with great regularity, that there are certain aspects of the partner arrangement between the Europeans, the Canadians, the Japanese, the Russians and the Americans that aren't codified in some document. It is simply that when you are partners you act as such. This was one of those times in which it was required of the Russians to act as partners.

They accepted that logic, however challenged it might have been, given the fact they'd surely preferred to have us pay for the privilege. As the records will clearly indicate, during the two and a half years the Shuttle Program was grounded between February 1st [2003] and the Return to Flight mission [STS-114] in the summer of 2005, there was never a dime additional transferred from the United States of America to the Russians, to cover these Soyuz flights.

I think that is a testimonial to their extraordinary dedication, resilience and understanding of what obligations call for. During that difficult time, there were great contributions made by all the partners. The Europeans in particular, the Japanese in part, the Canadians with great skill as well, contributed additional assets, stepped up and provided capabilities that went beyond what they were asked to do as part of their codified agreements. We all backed up the partners. There were plenty of things that the US did, accommodated and worked through in order to make that feasible.

There were crews aboard Station throughout that entire period that the Shuttle was grounded. The Station was resupplied. Sometimes there were harrowing times when we realized that something broke down that we couldn't get into a Progress vehicle. We'd have to figure out a way around it, to deal with it. Sometimes the grocery count was a little lower than we wanted.

Every day was an adventure. Walking into the office, the first question was “What now?” It was a continuous challenge trying to manage the flight manifests during that two-and-a-half-year period, but it worked. At the same time, NASA dutifully worked our way through all of the corrections to the Shuttle Program that the *Columbia* Accident Investigation Board recommended, and ultimately achieved a capacity that we had confidence could be returned to flight, and it worked.

WRIGHT: In the midst of those pieces that you just mentioned, you also managed to have a new vision come through a coalition of presidential direction. Can you share with us—your days were already so full doing all this other—how you managed to work those pieces, because you walked into your new job with an idea. You had an idea of what direction you wanted to move the agency in. Then of course *Columbia* happened, but you still managed to accomplish transforming the organization in a way to move to a new direction. Some of those pieces were able to move on to where they are now, and some of them didn't. But the main part of that is you still managed to get a transformational document in place to have people attached to, and to move in that direction.

O'KEEFE: That's a very positive interpretation and a far more diplomatic and charitable version than what others say. I'm grateful to you for that assessment, but I freely acknowledge there were different views of exactly how that was achieved. I take no personal credit in that achievement as much as satisfaction in the fact that the whole organization stepped up to an element of the agency's DNA – when there are periods of crisis and challenge, everybody pulls

together. It really was quite a remarkable organizational achievement. It is a fundamentally different outcome of my tenure than what I had in mind the first day I arrived.

My objective in the first year prior to the *Columbia* tragedy was to get the ISS completed, get it on track and get the cost contained. The day I walked in the door in 2001, a \$5 billion overrun was declared. It was just positively off the charts. Lots of mad partners. The International Space Station coalition almost fell apart as a consequence in that first year. It was a near disaster. Trying to reformat the whole ISS program and, concurrently, run all the other NASA programs was a real challenge. All the other things that were required to run NASA was a more than full-time challenge in and of itself.

When *Columbia* happened a year later and that tragedy unfolded, it was apparent to me on that very emotional and very difficult day flying back from Kennedy Space Center [Florida] that NASA's agenda was never going to be the same again. The set of leadership and management objectives that we had in mind just the day before the accident were now over. That chapter was closed.

I recently saw the gent who served as the budget officer during my tenure, Steve Isakowitz and I reminisced about that day. On the flight to KSC, in anticipation of *Columbia* landing, the conversation was entirely different. We were getting ready for a rollout of the President's [George W. Bush] budget position for the coming year, due for release the following week. We were preparing for hearings that were about to occur, doing a press layout of where we were going and what our objectives were and how we'd wrestled the ISS overrun challenge to the ground. We worked out a solution to that and agreement with all the partners. And the budget we'd prepared would continue to promote aeronautics, space, science and biological,

physical sciences at healthy levels. We had an education initiative we were planning to unveil. It was all part of the rollout. Twenty-four hours later, everything changed.

I am extremely blessed by the fact that I had the great good fortune of having been on the White House staff before moving to NASA. That made it easier to reach the President, reach the Vice President [Richard "Dick" Cheney], speak to the National Security Adviser [Condoleezza Rice] about some of the issues in the opening hours of what may have been the cause. I spoke first to the Homeland Security Department Adviser, soon to become the Secretary of Homeland Security [Thomas J. "Tom" Ridge]. All that was accomplished in very short order. Any NASA Administrator could have done that, but it might have been an introductory conversation for many of them. In my case it was the good fortune of not having been the first time I spoke to any of these leaders. I knew them all and had been sent there specifically by the President of the United States for this task. It was not a case where I had met him for the first time when I was about to be nominated. This was a case where I was a known commodity with all the disadvantages as well as modest advantages that may come with that as far as he was concerned.

It expedited the discussion and the nature of understanding. I understood the President's direction very clearly in very short order because I just knew his leadership style. His first question to me in the first hour when I **called** to tell him what had happened that morning, his first question, I'll never forget this, was he wanted to know where the families were. That was the first objective, make sure they're taken care of, make absolutely certain that our focus is there, to assure the crew families were well protected from the "press paparazzi," and make absolutely certain that this be the number one priority of what we do today, and every day. That was an immediate bolt of awareness, of course. Focus on the crew families was the first objective.

The second objective he laid out was, "Let's find out what we think we know. Be prepared for a summary of that. Plan a press conference to be conducted there at the Kennedy Space Center and I will deliver a national address later today." He said, "I'm not as concerned about what time that occurs, but let's be honest with the American public. Tell everybody what we know and answer honestly if we don't know."

That was extraordinary guidance from an incredibly insightful, very thoughtful leader. It made the follow-on discussions that answers your question regarding strategy. He instructed that I brief him on a regular basis. In the first month or two it was weekly at minimum. I talked to the Vice President nearly every day during that time, in the days that followed, as the findings unfolded and as we got ready for all the Congressional hearings that followed.

Every member of Congress certainly had a very clear understanding of what they wanted to derive from the hearings. The press, and the talking heads on the Sunday talk shows all had a perspective. But I had the specific advantage. As challenging and as time-consuming as all the efforts were in those opening weeks after the tragedy occurred, the most concise and clearest understanding of how we were going to move forward came from the President of the United States. He provided a very clear reminder that the strategy was not likely to look anything like what it looked like before. The accident called into question why the American public should accept this risk. We needed to define the nature of the NASA enterprise and better describe the purpose of exploration.

Over the months that followed, the President was very expansive in those strategy discussions about his intuitive feeling that it's human nature to want to know, to want to explore, to want to do things that tell us why and what is on the other side of the ridge. Otherwise humans would still be living in caves. If we didn't have that intuitive sense and desire as human

beings, we'd be just into self-preservation figuring out what's best for us to survive. He was very philosophical about it and driven by what I saw demonstrated with great regularity in those opening weeks and months. He has an extraordinary compass and grounding of what motivates human beings, why we want to explore, and what the focus of NASA should be all about.

Historians argue that NASA is a direct by-product of the Cold War era. That's stipulated. [President] John [F.] Kennedy was not out there arguing that he was a starry-eyed explorer. He was indirectly talking about how do Americans send a message to a leader [Nikita Khrushchev] on the other side of the Earth who had a habit of taking his shoe off and pounding it on the table and describing how they will bury us. How do you do that without being equally offensive and pointed? How do you demonstrate rising above, a larger than life capacity to say we're going to be about something bigger than this? That's what Kennedy was saying.

George W. Bush was leading us to a different understanding. Let's not just figure out how to maintain. This was a moment where we had to really think about, how do we redouble our efforts to define with great clarity why we explore.

Now procedurally, what the President did was to send me into the lane of the National Security Council, not because this was a national security matter particularly. It was partially so. But it was an organized, structured process by which you can vet options, sort out alternatives, and more often than not, reach a conclusion. Most other processes at the highest level of the US government don't have that same rigor. Some are pretty good, some are okay, some are downright poor. But the national security process has at least a good shot at an outcome. If he had wanted to dust this off, call it a day, get ready to retire the NASA "meatball," and call it a great moment of history, he probably would have relegated this to one of those other processes. Instead he picked the one that he knew would release an outcome.

Steve [Stephen J.] Hadley, the Deputy National Security Adviser at the time, was chairman of the NSC deputies committee that formulated all the alternatives. I'd served with him on other occasions of my professional life, so I knew him well, and was very compatible with him, and other members of the deputies committee. The State Department, OMB [Office of Management and Budget], [Department of] Defense, were standing members, and Hadley added [Department of] Commerce, other agencies as required to achieve a broader intragovernmental interagency resolution. The Office of Science Adviser, etc., OSTP [Office of Science and Technology Policy] was part of that effort and Jack [John H.] Marburger, who was the President's Science adviser at that time, he was a member as well.

But the President also added his Domestic Policy Adviser, who at the time was Margaret Spellings. She went on to be the Secretary of Education later. At the time she was the Domestic Policy Adviser to the President. I had worked with her in my time on the White House staff before going over to NASA. Importantly, she had been with the President since the time he was governor, so extremely strong linkage there, and he had very high confidence in her. The opportunity was for the two of them to be the cochairs, essentially. Steve Hadley was the process leader cochair in moving it forward, and Margaret brought in all the elements of the other agencies outside of the normal State, Defense, etc., NSC communities.

We met pretty regularly over the span of the next four to five months, and that whole sequence of events is very well documented in a book Keith Cowing wrote entitled *New Moon Rising*. I look back and have some different views of how events transpired. But that book is an accurate description of how the process steps worked and who did what. There are some descriptions of some players who were more dominant and engaged than I ever had a memory

of. But some people have perfect recollections of some things that never happened. That's the nature of history as well.

I won't embellish on the mechanics of the process or the specifics of the anecdotal cases other than to say this was a very well organized process that Steve and Margaret very compatibly ran on a regular basis to flesh out what all the alternatives would be, what the future of NASA might look like, and answer an extension of a larger question the President was posing, "what's the strategy and what are we trying to do."

Again, the President consistently went back to that first point that he raised to me on the day of the *Columbia* accident. We owed the families of the people who gave their lives an understanding of what this is all about and why they were exploring. The families were dealing with a life-changing tragic event for which their lives would never be the same. We owed them an explanation of what we are doing now and where NASA is going.

Going back to that day, the first public commentary I offered a few hours after the accident was that our obligation is to find out what happened, go fix it, and rededicate ourselves to the exploration goals they gave their lives to.

I didn't know the answer to any of those points. I didn't know why the accident happened. I didn't know how we were going to fix it. I hadn't any idea how we were going to be descriptive enough to say, "This is why the people you love the most that aren't coming back gave their lives for this purpose, for this reason. This is why they put themselves at risk." All that preceded and all that will follow who are explorers want to know what it is that they would be motivated by. Most explorers are about something much bigger than themselves. There are few exceptions most of the people in the NASA family are driven by something they think is bigger than themselves.

It's an absolute inspiration to be part of something that motivates folks to get up every day and do things that are way beyond our individual capabilities. Since I was at NASA, and many occasions since I've left, folks have asked, "How did you motivate people?" That was a snap. That was no problem whatsoever. And it had nothing to do with me at all. It was about what we were pursuing. All you had to do was remind everybody. You got 150 percent effort every time once you defined what NASA was about.

What a dream job. What an amazing place to be part of, because unlike any other institution I've ever been part of anywhere, universities, other federal agencies, companies, doesn't matter – there's nowhere near the level of just absolute unlimited dedication that can be motivated in people. That's not to say there isn't pride and history and tradition and culture and all things that go with that in many other organizations I've been part of. But NASA just absolutely stands out as one in which you do not need to do pep rallies. Motivational speeches are relatively simple. Almost anyone can do it. All you got to do is talk about what we're about, and everybody gets it. Everybody gets it.

[Former General Electric Chairman] Jack Welch is attributed in an anecdotal story that again is probably one of those cases of the perfect memory of something that never occurred, but nonetheless it made for good copy. He's reported to have walked around the Kennedy Space Center asking people how did they do things. He encountered a janitor and asked, "What do you do?" He replied, "Well, I'm here to make sure we get a man on the Moon."

WRIGHT: Everybody felt a part.

O'KEEFE: Sure. Those stories go on. Everybody has one. You can see it in evidence in every single thing that gets done that meets that definition of what I talked about in the beginning of how this is a place for which the objective is absolutely audacious. People get to be part of that. That's what they live for. That's why they continue to stay. That's why turnover is comparatively low. Why people put up with all kinds of challenges in order to do it, because it is that kind of place. Not every one of the missions are audacious, but no one sits around saying, "This is boring." You just don't find it. Everybody feels like they're part of it in some way, shape or form. Sometimes you got to work at that dimension of it, but it does take that leadership and managerial skill set to do.

Post *Columbia*, I stood in front of everybody at NASA and said, "All of us are in this together in how we fix this." I did not need to go through an explanation. I didn't need to use [Microsoft] PowerPoint; I didn't need to have charts. All that had to be said was, "We're going to count on everybody here to figure out how we're going to fix this."

WRIGHT: Did you find a surprise from the workforce when before a year had gone by that we weren't just coming back, we were moving much more forward [with the Vision of Space Exploration]? Did you get a welcome surprise?

O'KEEFE: It was a mixed bag in that sense, because there were some people who felt that way, and some folks who'd connect the dots and said, "Boy, this is a different place, it isn't like what we left, and maybe it isn't going to be that bad, matter of fact it might be quite exciting, might be very different."

The alternatives that were being vetted in this White House process I described were clearly starting to get some discussion currency in large fora, as everything does. There's nothing confidential in Washington, DC. It doesn't stay closed for very long. Lots of things circulated in bits and pieces of discussions that went on continually. There were some who did view that as an opportunity and viewed it as an extraordinary new chapter. There were others who were gripped by the challenge of how do we accomplish the first step, which is to get back to flight, and then how do you define what is safe and what is risk, and what's acceptable risk.

All those were important arguments, debates, thoughtful, probing exercises. Every one of them are all critical to do. But it had the occasional challenge of introducing the paralysis of analysis, which is sometimes a definition of what we love to do at NASA too. If you're not constantly reminded what the mission objective is, what the outcome we're looking for, how do we get there, what do we do, you can get ground down pretty hard. It wasn't for lack of attention or interest or motivation or dedication by people to expand in the time. There was a hope that the analysis would tell us the answer.

Again, one of the things we talked about at the beginning of this conversation was how do you define the objective and how do you state something that you want to be an outcome but has never ever been achieved because no one's ever done it. Where's the database? Where's the prior history of reaching those goals? It's partial. It's incomplete at best, because by definition most of what NASA pursues has never been done. When challenges arise inevitably comments arise like, "we never envisioned that, we never imagined that, we didn't know that would ever happen, how do we conquer that."

NASA relies on data for everything. But problems arise when data is used to be reassured. Data is what motivated us to believe that there was something within an acceptable

parameter of risk. In the case of *Columbia*, that turned out not to be. Again, not because anybody was lazy, malicious or slovenly about it. We read into the data and the analysis more than what was there. It was incomplete, and we reached conclusions that were wrong. That's the stark reality that unfolded.

In parallel with the White House the strategic planning process I was describing, the *Columbia* Accident Investigation Board was completing its work. Think back on the timing. I can't even reconstruct in my own mind how every one of those processes were going on simultaneously, and yet we were able to keep plenty of fingers in the dike to keep it contained— investigation, dealing with the [ISS] partners, keeping the public support from unraveling, endless hearings. Then the accident investigation board, the *Columbia* wreckage collection and reconstruction, return to flight strategy development – all these other things that were happening simultaneously.

As challenging as it proved to be it was very apparent to me that the strategic planning and ultimate “Vision for Space Exploration” would not have happened had it not been for this horrific tragedy. It was a catalytic event that prompted deep soul searching.

The outcome was driven by clear, unambiguous direction from the President of the United States. When we sat down, all the alternatives were presented, vetted, less acceptable options dismissed, and finally narrowed to outcomes that really looked achievable and deemed affordable. Each option met the Exploration objective the President had articulated on prior occasions. The meeting lasted if I remember right, somewhere in the range of an hour and a half at most. The President was very focused. When he selected an option he said “That's what I want to do. Write it up.” His final words were walking out of the room. “Tell me where I'm going to go to announce this.”

I don't remember it exactly, but it was no more than 10 days after that decision meeting he was at NASA Headquarters announcing it. It took almost a year. February 1st [2003] to January [14, 2004].

The task of developing a strategy could have been all-consuming all by itself. But other challenges were happening at the same time. The convergence of all the factors were informative to how to get to that answer, and helped us respond to some of the broader questions that were involved. Oh yeah, by the way, in the middle of all that *Spirit* and *Opportunity* [Mars rovers] landed.

WRIGHT: Yes, and two wars were going on.

O'KEEFE: The Vision for Space Exploration was certainly not the only thing on the President's mind. He had several global issues churning. Yet, it was a very focused time in which I talked to him several times leading up to the Vision for Space Exploration decisions. All the way to the day before the speech was delivered, we were editing. I was talking back and forth to his space writer. Every one of those words were picked for a reason. It wasn't a staff document that had several authors, but went through several editorial permutations.

In part, the *Spirit* and *Opportunity* landing helped highlight the significance of the strategy. I wish I could tell you I timed that. Everybody would know better than that.

NASA needed a win badly at that time. We needed a victory and boy, did we get one. It was a worldwide phenomenon that was breathtaking. It was just fantastic. These events have led me to describe the nature of the experience at NASA as being defined very precisely by its great triumphs and its great tragedies. No doubt about it.

I got a huge dose of both. But the fact that these factors all converged made for a great precision to focus on the strategic direction. The President again was involved with *Spirit* and *Opportunity* too. He called the mission control folks in Pasadena [California, Jet Propulsion Laboratory] and congratulated everybody and did a big conference call. I was with him on another occasion where he spoke to some other folks. I was at the White House, at [NASA] Goddard [Space Flight Center, Greenbelt, Maryland]. There were several events involved. One of the insignia plaques on the *Spirit* and *Opportunity* vehicles named the principals. It was installed at the Jet Propulsion Laboratory. To lead off, it reads "George W. Bush, President of the United States." He had a lot of passion about the mission and he was very excited about the results. I think he's taken a lot of gratuitous shots from different editorial writers for not having really talked about the vision for Space Exploration much thereafter. I think he did. He just didn't go out and beat his chest about it and apparently that disappointed his critics. Every day until the day I walked out of the office, my last day, he was accessible. Again I don't want to leave an inference that these were regular meetings or his highest priority. But, each meeting discussing the Vision for Space Exploration was for a purpose and at scheduled times. The President was more than accepting of discussing the Vision for Space Exploration as was the Vice President. The VP was very accessible as well. There were a lot of Return to Flight activities that I briefed him on regularly, at the Vice President's residence. He'd come to NASA on occasion, he went to Houston [Texas, Johnson Space Center] once as I remember, for one of the Return to Flight task force meetings. He did participate in the strategy debate and engage through the National Security Council apparatus. That's how he involved himself, and the President.

That level of involvement of the leadership at the highest levels is positively necessary. That part every historian gets right. That said, some suggest that's all it takes. And that's dead wrong. It requires leadership at the highest level to define the objective, to remind everybody what the point is, to define what they want the end state to look like, and then to regularly motivate those to keep up the process to get there. I would hear regularly from journalists and historians who couldn't wait to offer advice. Every conversation started with, "All you need to do—." That phrase I must have heard hundreds of times. "All you need to do is get the President to say—." It doesn't work that way. It takes repetitive effort. It takes the capacity to move this when necessary. And it requires a convergence of events to shape the outcome.

I wouldn't dare calculate how much time the President dedicated to this, because it wouldn't be more than hours. But it was all very focused time, and it was not all on one occasion. Every step. His visible involvement kept everybody in the tent. It forced some great alliances, it really did. There were several extraordinary professional alliances that worked as a result of it.

For example, having Rich [Richard L.] Armitage as the Deputy Secretary of State and active on the NSC deputies committee was a blessing. I'd known Rich a long time and I asked him, "Rich, I really really need your help in there. I can't be sitting there with a bunch of third and fourth string guys who are being sent in order to fill a chair. I really need your help." His regular engagement at those NSC meetings sent a powerful message. Meanwhile we were negotiating with the Russians as we discussed. Rich was extremely helpful with that. There were a couple trips that he and I took to Moscow together. That helped demonstrate that the US government policy was fully aligned.

He was just definitely engaged in the whole thing. Those are the kind of examples of what I'm talking about in terms of how it takes a much greater kind of focus to this. I don't kid myself thinking that anyone or any collective of individuals can manufacture this process to take off and go do things. *Columbia* was a catalytic event. The President was determined to make it as positive an outcome as could be achieved, knowing that there would be no ultimate positive outcome, which would be the return of those seven remarkable people.

Just the compassion he demonstrated with every one of the families. He met with them individually, and collectively. He wasn't just telling me, "Go worry about them." No, he did so himself. When he travelled to JSC for the memorial service, he spent a lot of time with the families individually. He spoke to them the day the accident happened by conference call and they knew who he was. They knew the sentiment and sincerity was coming from him. In the weeks that followed the Houston memorial service, he met every one of the families every time there was a funeral at Arlington [National Cemetery, Virginia], of which there were four. March 1st was the last of the funerals. It was for Lieutenant Colonel [Michael P.] Anderson. His family and all of the families showed up. As they had done on the first of the funerals, they all spent time in the Oval Office with both the President and the First Lady [Laura Bush].

I'll never forget. This was not a 15-minute meeting. They sat together for well over an hour. There's a picture hanging in my office that was taken by the White House photographer that I have always kept that just captured the scene. After the hour or so had passed and the kids had been outside running around on the lawn and a couple of kids chasing the dog, he looked at me and said, "Well, so where's everybody going from here?"

I said, "The staff has arranged for a tour of the White House."

He said, "Really. That's great." He looked at the First Lady and he said, "We know a fair amount about this place. Why don't you all come with us? We'll show you around." They spent another hour walking around ceremonial spaces, went up to the residence on the second deck. Everybody had a cup of coffee.

He just made them feel like this was not something that he was just going to close the chapter. This is a guy who deep in his soul feels a responsibility in those cases. His actions were never really reported, about this for sure. None of these pictures were released. Nobody put it on the Web site. Nobody put out an announcement, "The families were here." None of that.

But he demonstrated that personal compassion with great regularity throughout his entire tenure. Going to Bethesda [Maryland] and Walter Reed [National Military Medical Center] and visiting wounded warriors, not just once in a while, every single week, and never had a photo entourage, never had the journalists running around. No. This was all about him telling people that he understood exactly what his responsibility was, and he would never be adequate in telling them what the nature of the loss was all about and why it had to happen that way, and that he was always going to be deficient, and yet at the same time he made an extraordinary effort to make sure he connected.

This was not a guy that would sign a condolence letter with an autopen. Never. Every one of these tragedies were personal. Just to this day I still marvel at the depth of commitment he demonstrated.

WRIGHT: Let me take it as my responsibility to close the session now since we've gone over our scheduled time and I don't want to throw you off the rest of your schedule today. Thank you again.

[End of interview]