

NASA AT 50 ORAL HISTORY PROJECT

ORAL HISTORY TRANSCRIPT

SHANA L. DALE
INTERVIEWED BY REBECCA WRIGHT
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WRIGHT: Today is September the 11th, 2007. We are at NASA Headquarters in Washington, D.C., to speak with the Deputy Administrator, Shana Dale, for the NASA at 50 Oral History Project. The interviewer is Rebecca Wright, with Sandra Johnson and NASA Chief Historian Dr. Steve [Stephen J.] Dick. In preparation for the space agency's fiftieth anniversary, the NASA Headquarters History Office commissioned this oral history project to gather the thoughts, experiences, and reflections from NASA's managers. The information recorded today will be transcribed and sent to the NASA Archives located here in Washington, D.C., where it will be accessed for future projects.

We thank you again for taking time for this project in your very busy schedule.

DALE: Thank you.

WRIGHT: We know that you became Deputy Administrator on November 14th, 2005, and prior to accepting this position you were serving as the Deputy Director for Homeland and National Security for the Office of Science and Technology Policy [OSTP]. Would you share with us the reasons why you chose to leave that position and take on this position here at NASA?

DALE: That was not an automatic decision for me when I first started talking to Mike [Michael D.] Griffin about the potential to come over to NASA as the Deputy. It's particularly relevant

today, September 11th. As you mentioned, I was the Deputy Director for Homeland and National Security at OSTP. I worked most heavily in homeland security science and technology that supports our efforts to combat the threat, the terrorist threat that we face. That's something that I continue to be deeply passionate about, and I loved working in that area.

I have to say that I've actually been lucky to work both in the space field and also in homeland security, because the people that commit their lives to these goals, to these missions, are incredibly dedicated and passionate.

So from that standpoint it wasn't an automatic for me, the reasons that led me to decide to go into the process, the confirmation process, were, first of all, that there was a Vision for Space Exploration. This Vision set goals, multigenerational goals, for what NASA will do in the human space flight arena beyond what we're doing in low-Earth orbit. The Space Shuttle and International Space Station are incredibly important projects, but I had been concerned for a while about NASA's goals and its mission, particularly in human space flight, beyond those specific missions.

While I was in the White House, I was very happy to see that the President [George W. Bush] was devoted to the same types of goals in terms of space exploration. So with that as a backdrop, I was very interested in coming into the agency because of space exploration. Obviously, the other areas of NASA excite me as well. Space science and Earth science have been huge success stories for this agency, tremendous discoveries. The aeronautics work is incredibly important to the United States.

So all of those are important, too, but the most compelling reason for me was that we now had this multigenerational space exploration effort. I knew coming into it that Mike Griffin and I would kind of be going through, for lack of a better word, kind of a slog; trying to develop

the foundation that hopefully enables this vision to carry on and have a really strong foundation to move forward.

The second reason for me to come to NASA was that Mike Griffin was here. He and I have followed each other's careers for a very long time in the space community. I have an enormous respect for him that has only grown during the time that I have been at NASA. So the combination of those two factors, having the Vision for Space Exploration and having Mike Griffin, a person who I think is uniquely qualified to lead NASA because of his extreme intellect, project experience, the fact that he'd previously been in NASA, and his private sector experience. All of those capabilities together mean that, he is uniquely qualified to lead this agency.

So it really had to be those two factors together. It couldn't have been one without the other. That was the thinking—kind of longwinded—that went into the decision to move forward into the confirmation process.

DICK: Can you say a little about the division of labor between yourself and the Administrator?

DALE: Well, as you know, everything in the agency reports up to Mike and me, so earlier today we were both in one of the meetings, a review for crew exploration vehicle, Orion. We're both a part of the decisions that are made. He obviously is going to focus in much more detail on the hard-core engineering, the very technical aspects of the agency. But there are many issues within the agency that are technical that rise to the level of policy as well, because many of these decisions have policy-related implications. So that's usually where I come into the picture.

When he was looking for somebody to become Deputy and also the Associate Administrator, he obviously went back to the time frame of [James E.] Webb and thought that that was a really great model in terms of having complementary skill sets. So he was looking for somebody who had extensive policy-related experience; management; familiarity with NASA, that I gained during my time on Capitol Hill where we had oversight of NASA; and political experience, knowing how Congress and the White House work.

All of my background was important to balance out all of the skill sets that he brings to the table, as well as Chris [Christopher] Scolese, the Associate Administrator who has long-term experience in the agency and great technical expertise as well. So I think it's the combination of all those skill sets that come together.

On a day-to-day basis I oversee some of the functional areas within the agency, and that includes financial management, information technology, procurement, human resources, legal, international relations, property management, environmental compliance, legislative, public affairs, strategic messaging, and education.

The four of us at the top have a really, really good dynamic, which I think is very healthy for this agency. That includes Mike; me; Chris Scolese, the Associate Administrator; and Paul Morrell, who's the Chief of Staff. We meet every morning during the week to discuss the issues that arise in managing the agency, and we have a really good working relationship. We like each other as well, which is very helpful. So I just think it's really great to see that in any department, really any organization, that you've got leaders at the top that work so well together. I would say the vast majority of time we're kind of in a mind meld together in terms of what direction to take the agency and what steps we're going to implement.

WRIGHT: Speaking of financial management, you've been known to say that when coming to the agency, you knew that [financial management] would be one of your first areas of focus. Could you share with us why you felt that that was going to be an immediate focal point, and what that means for the future of the agency?

DALE: Well, that was mainly because Mike and I had already talked about the functional areas that, should I be confirmed, he would be looking to me for leadership in the functional areas. Given the long history that NASA has experienced with financial management woes and the fact that we haven't had a clean audit opinion for a while, I knew that, just from that standpoint alone, that that was going to be a significant focus area.

But also during the confirmation process you meet with a lot of Senators who are on your confirmation committee, the Senate Commerce Committee. There was a lot of concern expressed about the financial management system, and they were quite interested in terms of what the state of play was within the agency and how much focus I was going to bring to financial management. It's incredibly important to any organization, but it's very important to NASA in terms of having accurate data that supports the projects and the programs, in terms of exactly where they are at any point in time.

There has been significant progress, which is good news. We're obviously very pleased about that. We've been making progress not only in our audits, in terms of the material weaknesses that our auditors review, but also OMB [Office of Management and Budget] ranks agencies in terms of their status and progress, and in progress we've actually turned green, which is the stoplight indicator that we are making significant progress.

We've also ticked off a number of items in terms of progress on our corrective action plan. There's still a ways to go on financial management, but we have processes in place and coordination among all the functional areas that impact financial management, the Integrated Enterprise Management Program; information technology; and property. Property management, in particular, is important because it's another area where we need to make significant progress over the next couple of years.

WRIGHT: We'd like to have you share with us some information about the commercial aspects and the commercial interests that will be so involved with NASA in the future. We know that you co-authored the Commercial Space Act. So explain to us, too, how the partnerships between NASA and entrepreneurs are going to be changing or evolving, or how you would like to see them move in the next years.

DALE: Mike Griffin and I are definitely of the same mindset that if the commercial sector can provide relevant services or hardware, and it's relatively cost-effective, we want to procure it commercially. To the extent that commercial space activities are viable in low-Earth orbit and potentially what we're doing in terms of an outpost on the Moon, that's an indication that we as a society have actually made it in terms of establishing a strong foundation with what we do in space. You know, it's just like [Meriwether] Lewis and [William] Clark on their exploration, and eventually people followed and commerce followed on the rivers, etc. So that's one angle of it.

Another angle is to the extent that they can provide these services or hardware, whatever the situation may be, that allows us to procure commercially, and it frees up NASA to continue

to pursue the cutting edge, pushing the edge of the envelope, which is exactly what the federal government should be doing. If the private sector is able and willing to provide commercial services or goods, the federal government needs to get out of the way. So that's been a longstanding philosophy for both Mike and myself.

I think there's definitely been progress. You see it most significantly in terms of COTS, the Commercial Orbital Transportation Services project. This is the project for which NASA is providing some seed money—also commercial entity providing their own money—in the hopes of developing capability to bring cargo up to the International Space Station, and eventually crew as well, which would be incredible, especially given the gap that we're facing between Space Shuttle retirement in 2010, and now Orion and Ares are not expected to come online for four and a half years. That's a significant gap.

DICK: After 2010.

DALE: After 2010, right. So right now we know we have to focus on provision of capability, obviously from the Russians, potentially also from the Europeans and the Japanese, for cargo. It would be great, and needed in terms of what we need to do with cargo and getting crews up there, if we could also rely on the American commercial sector. So to me that's one of the most significant activities that we're engaged in.

Mike and I have worked very hard since we've been in here. Obviously, even before I came into the agency, he was absolutely committed to COTS. That has not wavered, even though from a budget standpoint it would be easy, I think, to take that money and put it into some of the areas for which we're having funding problems. But given the fact that it remains

and it is a healthy level of contribution coming from NASA, that should give an indication of the level of commitment that this agency has for that commercial activity.

Also, some other things that are happening out at [NASA] Ames Research Center [Moffett Field, California], their goal of reaching out to entrepreneurs and venture capitalists and others in Silicon Valley to see what kind of synergies exist and what type of partnerships would benefit NASA.

So I think that's promising, and we'll see exactly where that leads us. But I like seeing within NASA an opening up to the perspective that there's a lot of great talent in the United States. Back in the days of the Apollo, NASA had to be a driving force for most of the technologies that were needed. Now, there are many areas where NASA continues to drive technological innovation and many areas where cutting-edge technology comes directly from the private sector.

DICK: To go back to COTS for a minute, recently you had a setback there with Rocketplane Kistler. Do you consider that a tactical setback or strategic setback? What's your view on that?

DALE: I want to be careful in the ways in which I answer that, mainly because that's considered to be very sensitive right now from a procurement standpoint. I would just say that that's a tactical setback at this point. But I think there's significant capabilities that reside out in the community, so we'll see what happens over the next several months.

WRIGHT: How do our international partners feel or will fit in with the commercial aspect moving more and more into the NASA environment?

DALE: The federal government is always going to have a role in space, and that's pushing the absolute boundaries. There are going to be certain activities that I don't necessarily see the commercial sector ever taking an interest in, because there are areas that aren't going to have a return on investment, and that includes some of the fundamental work in space science, for instance. So there's always going to be a role for the federal government.

The same is true for other nations, so when we collaborate with other countries, we collaborate with those space agencies of the other countries, and that will definitely continue. The question is the extent to which those other countries and their space agencies collaborate internally with their commercial entities, and I know they have significant collaboration.

What I think you're seeing in the United States is an effort to tap into the entrepreneurial or nontraditional aerospace community, and that's a change. It will be interesting to watch and see the extent to which that also occurs in other countries.

WRIGHT: Although NASA continues to share its vision and its message, research has shown that the American public has little specific understanding about what NASA does or why it is relevant to their lives. What do you believe to be NASA's most important role for the nation?

DALE: I think the most important role for the nation is that we're the agency of exploration and discovery, so that we are always extending the frontiers. I think for a lot of us, not just at NASA but throughout the United States and probably throughout the world, our imagination is captured by the idea of us developing an outpost on another world, eventually moving out to Mars, but taking these toeholds as Mike refers to them, of exploration, and actually moving out into the

solar system. It is a multigenerational effort and one that extends as far as we can imagine into the future.

What's the potential for even going beyond the solar system? Who knows what will happen there? But that's exciting. It's inspirational and it inspires many kids along the way to continue on in science, engineering, and mathematics.

Space exploration is hard and complex and requires us to develop innovative technologies. NASA pushes new markets and new technologies that are important for economic competitiveness in the United States. That's another area that I don't think we have been as effective as we could be in communicating that to both the American public and some of our stakeholders, because when a lot of people now in 2007 talk about innovation in the federal government, NASA usually doesn't come to mind for them. They're usually talking about the National Science Foundation or different parts of Department of Energy or different parts of Department of Commerce.

Many of us would like to see NASA in that equation as well, in terms of understanding NASA's significant contribution to innovation and how technologies that are developed for space exploration are then enhanced or transformed—usually by somebody in the private sector—into applications that are incredibly important here on Earth. That's only going to continue, particularly with going back to the Moon and then on to Mars. The types of capabilities that we're going to have to develop, particularly alternative energy sources, could have huge implication for what we do here on Earth.

DICK: So would that be your answer to the question we always hear, “We should solve our problems on Earth before we go into outer space”?

DALE: First of all, NASA's funding is only 6/10 of one percent of the federal budget and it results in a huge return on investment in terms of achieving scientific discoveries, exploring the space frontier, and developing innovative technologies. Tackling the hard challenges of space exploration, whether you're conducting human missions or robotic missions, results in benefits here on Earth. That also is incredibly important to our economic competitiveness. At its very core, space exploration is very important for the purposes of discovery and venturing on to the next frontier and it's important, not just to the United States but all of humanity.

I was really struck when I watched the premier of *In the Shadow of the Moon*, and they were doing clips after Apollo 11. I was fairly young at the time, so I remember the landing, but not necessarily the outpouring from the rest of the world. What the Apollo 11 astronauts were talking about was when they went and visited other countries after their mission, it wasn't just that they had done this for the United States. The sentiment expressed by those in other countries was that the astronauts had accomplished this incredible feat for the entire world and for all of humanity.

It was very striking to me, because that's what I think about in terms of what we're trying to do now with developing an outpost on the Moon and going on to Mars. This is going to be an intense international collaboration. We're obviously leading the way in terms of space transportation capabilities, but this is going to be a huge community coming together and developing the outpost and all the capabilities.

DICK: With your experience in Congress, do you find that Congress is impressed by that argument for exploration, or do they have other drivers?

DALE: I think it depends on the individual, because different people are going to resonate with different messages.

DICK: Outside of Congress, too.

DALE: Outside of Congress, too. A lot of people, a lot of us who are diehards in the space community, we know what we're consumed by, and that's the idea of pushing, pushing the frontier and pushing the idea of exploration and discovery. That engages a lot of members in Congress, but not all.

So some members are very interested in the missions that NASA engages in and what impact that has on the youth of the United States, and to the extent that they're actually inspired to pursue science, technology, engineering, and mathematics, that's pretty significant. We've seen spikes in the past with the Apollo program, and then the Space Shuttle Program, in terms of kids in college actually going into aerospace engineering. You hear that time and again, kids who want to be astronauts or space scientists, and because of that they are inspired to study science, engineering, and math. So there is a correlation and that is important to many members.

Other members are very interested in innovation and economic competitiveness for the United States. That's the area, again, that I feel like we don't get the recognition that we deserve as an agency for what we've done in the past and the contributions we're going to make in the future.

So it varies by person, based on what their experiences are, what part of the country they come from, a whole host of variables. But there are going to be different things about NASA

that engage different people. To me that just goes back to our 1958 [National Aeronautics and Space] Act, which calls for the widest possible dissemination of information about the agency. Today we need to educate, create awareness, and conduct outreach in order to reconnect with the American public. Because, as you mentioned, they get excited about NASA, but they're not sure why. So I feel like we've lost that connection with them about all the amazing things that we're doing.

DICK: It's an interesting kind of social science research question why some people are motivated by exploration and others could care less. [Laughs]

DALE: Yes, I know.

WRIGHT: Since you mentioned the Space Act, I wanted to ask you a question about national security. The original Space Act states activities in space should be devoted to peaceful purposes for the benefit of all mankind. Based on your current and previous experiences with all the groups and organizations and the positions that you've had, do you believe that there's indications that NASA may alter this policy in any way due to the evolving movement of global terrorism and in the name of national security?

DALE: I don't see NASA's charter changing at all in terms of seeking out international collaboration for peaceful purposes in what we do. I don't see any changes at all in that philosophy.

WRIGHT: As we were preparing for your interview, we reviewed some of the previous Deputy Administrators. Traditionally, those who have served have been male and either had engineering, science backgrounds. Your credentials are different from those. How do you feel being in this role with your qualifications is going to help NASA meet those goals [of Vision for Space Exploration] and expectations that you would like to see met as well?

DALE: One of our greatest challenges, I believe, is communicating effectively what the Vision for Space Exploration is, what it means to embark upon this next great era of exploration, and having that communication with a broader base in Congress, the American public, and the international community.

NASA, after the fights in the 1990s on the International Space Station, which I lived through on Capitol Hill, got to a point where—and this is not negative at all; it's just a natural evolution. As that fight started to wane, the outreach to Congress became much smaller and became more focused on members and Senators that represent regions and states that have NASA centers or NASA contractors, or individuals who are very much in tune with the mission of NASA, as opposed to connecting with a much broader base in Congress.

I think it is incredibly important, and we have been working on this since I have been here, to reengage with a broader community on the Hill to talk about what we're doing and the importance of what we're doing to the United States for the things that we've mentioned before, exploration and discovery.

But also another issue that I didn't raise that will touch some members is strategic leadership, being a world power. One of the defining elements of being a world power is having a human space flight program. That's something obviously Russia is well aware of, China is

newly emerging on this world stage, and India is expressing interest in developing their own human space flight program. Given India's capabilities and their very strong motivation, I have no doubt that they are also going to fulfill their desire to have human space flight capability. The issue of strategic leadership in space is important to many members of Congress.

But again, getting back to engagement with the American public, that needs to continue, and there's a whole host of things that we're looking at internally, including redesign of our website, which is fairly antiquated at this point. There is criticism of anybody in the agency. The guys who have been running the website are limited in number, and they've been running it on a shoestring budget. Since I've been here, I've dedicated more resources to trying to significantly advance our website and also really focusing on content for the NASA website, trying to become much more interactive and be a go-to place for the exciting things that are happening within the agency. That's one communication tool.

We're also embarking upon a lecture series. Mike is going to give a speech on September 17th at the National Press Club, and that will be the kickoff of a lecture series here in D.C., which different notable high-profile people will come in and discuss different aspects of America's space program. He's going to be talking about the space economy.

We're also looking at going beyond what we like to refer to as "the choir." We've been very effective in the past talking within the aerospace community about what we're doing, and that's great. We're going to continue to do that, but there's definitely a realization that all of us need to get beyond this group. It's a little bit premature to talk about the different places that we've pinpointed in the country, but they're definitely outside the traditional aerospace communities, and they're groups that may be focused on commerce or environment or a whole

host of other issues where we haven't necessarily engaged with them in the past, and we feel like we have messages for them. So that's part of it.

WRIGHT: One of the topics that seems to come up in the midst of the excitement of the Constellation Program is the significant gap, to use the two words that you used earlier. Would you give us some details on how NASA is going to move smoothly through this significant gap?

DALE: First of all, we are very concerned about the duration of the gap. When Mike first came in, he was obviously and still is committed to narrowing the gap to as short a time frame as possible. That's also a requirement that we have in statute, based on what the Hill passed in the NASA Authorization Act of 2005, a specific requirement that the replacement come online as soon as possible after Space Shuttle retirement.

What we're concerned about is similar to what happened between the retirement of Apollo and bringing the Space Shuttle online. That was a five- to six-year gap, and what happened was people left aerospace entirely. They either left NASA or they left the industrial base, and they never came back. That's a huge learning curve. It's a huge recruitment issue. That's just going to be devastating in terms of if that happens again, so we're very concerned about that.

I've had discussions with senior people in the agency, and they've said they could probably make the transition from Shuttle to Orion/Ares work if the gap is three, three and a half years, or maybe four years. But as it starts to go beyond four, that becomes a real issue for us. It's an issue not only in terms of workers and then impact on industrial base, but also our reliance upon the space systems of other nations. That's fine up to a certain point, but then you really

have to question what we're doing as a nation given that we'll be ceding our leadership position in the world space arena for a very significant amount of time.

Now, what we are doing is making significant progress on those programs, Orion and Ares, and those are proceeding forward. We're going to have all of our contracts let on Ares by the end of the year. So we're fulfilling commitments on our end to do the progress that is needed to carry these programs forward.

I think the other thing that is needed is just continuing to explain why we are so concerned about the duration of this gap. I think many members in Congress understand that, and they also share our concern about the duration of the gap. Obviously, when a new administration comes in, there will need to be a discussion with them as well in terms of the concerns related to the gap.

WRIGHT: Next year NASA celebrates its fiftieth year. You've touched on this, the answer to this question, off and on, but we would like for you to share with us what you believe to be NASA's impact on society in the past and now and what you expect it to be in the future.

DALE: Well, I think NASA's historical impact is taking something that's inconceivable and making it happen in a relatively short period of time. We demonstrated the can-do spirit that Americans possess with the incredible mission of landing men on the Moon and bringing them home safely. It's so compelling, and as we mentioned earlier, the whole world watched with us, and the whole world watched with us during Apollo 13 when we were all worried about the crew actually making it home alive.

The agency will always be known for pushing the boundaries of exploration. Obviously, there have been so many successes that this agency has experienced in the realm of space science, resulting in incredible discoveries. I think that typifies what NASA has been to the American public in the past, and will be in the future. Currently, we're going through this transition period, a relatively hard transition period, trying to finish assembly of the International Space Station, retiring the Space Shuttle, and bringing these new systems online.

This is a very difficult period in the history of the agency, but we will eventually get to the point where we have developed this new human space flight capability, established an outpost on the surface of the Moon, and at some point in the future we will journey on to Mars. So I think that's an incredible future to look forward to. And again, it kind of blows the imagination in terms of actually sending humans on to Mars. That's going to be an incredible feat when it happens.

And who knows what's going to flow from it? Just as breakthrough technologies came out of the Apollo Program and the Hubble [Space Telescope] Program, just to name a few, innovative technologies will flow from other space endeavors as we're pushing innovation, and the technologies that are important for the space program. Somebody in the private sector is going to see a link between what we're doing and whatever practical need exists here on Earth. They're going to take new technology that NASA developed, and they're going to modify it, enhance it, and who knows what spectacular benefits will result from it?

DICK: So it's a difficult time in the agency's history, but it's also a turning point, wouldn't you say?

DALE: Yes.

DICK: One of the turning points in NASA's history.

DALE: Yes, I think it is a turning point. It's just a very difficult time right now for not only the reasons that we've talked about, but also a lot of fundamental changes in the agency, governance structure, trying to turn the agency around in financial management, trying to make very difficult decisions to turn around information technology in the agency, which hopefully we can do that by the time that we walk out the door at this agency. Those are things that will have lasting impact on this agency as well, because they are part of the core foundation of any organization.

DICK: Now, what do you mean in particular—I'm sorry to interrupt—by the changing in IT [information technology] and the changing governance structure. What in particular?

DALE: Well, governance structure, when Mike came in, he wanted to make sure there was a separation between the programs and the [NASA] centers in particular. Previously centers had reported in to mission directorates. So now mission directorates and centers are on an equal footing, and both of them will report directly into the A-suite [Administrator's office]. So that's fundamentally different. The programs flow from the mission directorate directly into the centers, and those people in the centers report, obviously, into their center management, but they also report back into the mission directorate structure. So that's different, and I think people understand it now, but there are still some struggles along the way in terms of governance.

In regards to information technology, that's an area that, like many organizations, has grown up piecemeal or ad hoc. For NASA it's been an intense focus on information technology

needed for programs and projects and individual organizations, instead of looking at information technology strategically across the board and the types of integration that's needed.

So what we have are a lot of information technology systems throughout the entire agency, and the direction that we're moving in now is trying to integrate so that we have seamless information technology that also allows for centers to collaborate, because right now some centers have firewalls, so it's actually hard for people, for instance, who are working on Constellation. Constellation work resides in every single center throughout NASA. It makes it hard for them to actually share data right now.

Also, given the fact that it's grown up over time kind of in this piecemeal way means that there's been duplication along the way and in some areas, too much complexity. That all adds up to too much money, and potentially wasted money along the way. So that's another area of efficiency that we're tackling. It will be a struggle, but it's incredibly important for NASA.

Another fallout of all of this decentralization and culture at NASA is information technology security. You have an agency of scientists and engineers who don't typically think of the ways in which our information might be used by adversaries, so information technology security is a very critical component of what we need to improve.

DICK: So your homeland security background is coming in here.

DALE: Yes, definitely. Definitely.

DICK: Well, you've worked at several places throughout the government, several agencies. How does NASA compare? Is there anything that sticks out?

DALE: Well, I have not yet worked at another federal agency. OSTP is really a part of the Executive Office of the President, although it is its own agency in terms of having all the functions that a normal agency would have, housed in that small office.

DICK: And, of course, Congress is one of a kind.

DALE: What can you compare that to? That was a great experience, both being on the Hill and also being in the White House. It's really hard until you get into either one of those to understand how they work and how they operate, and it's kind of hard to penetrate on the outside.

I would say the first thing, again, is the fact that I've been really fortunate to work both homeland security and space issues. The people that do this day in and day out, they love their jobs. They're dedicated. They're committed. They're *very* passionate. You don't always get that in the federal government. So, from that standpoint, it's really nice to work in this agency and see the level of devotion and commitment to America's space program when you go out anywhere in the agency or the broader aerospace community.

I think the other things are just what you would expect in large organizations and also in bureaucracies. It's not going to be the same level of bureaucracy at NASA as it is at some of the bigger departments, which is good, but it's a level of bureaucracy that you don't necessarily encounter in the private sector. Throughout my entire career, if I felt a sense of urgency about particular issues, I would want them to be taken care of very quickly, and so I have had to learn patience in this job, because things don't move as quickly as I would like them to move.

DICK: Any other big surprises since you've been here that you didn't expect when you came? I know that's a general question.

DALE: I think I just take it day by day. There definitely have been some things that have happened over the course of this past year that I did not think when I came to NASA I would be dealing with, but I think those are outliers. Those were unusual situations that would have taken anybody by surprise.

DICK: We know what you're talking about, but do you want to say it?

DALE: When we had the issue of the arrest of the former astronaut, Lisa [M.] Nowak, that was shocking and not what you would expect, coming into an agency.

WRIGHT: I have one final question. You've given us such a great snapshot of the role that you have and some of the things you're looking forward to. What do you feel is going to be the most challenging aspect of your role in the next years?

DALE: In the next— Fourteen months. [Laughter] It's a relatively short time that we have left, because Mike and I'll say, "Oh, we've got two years left," and then I'll modify it, and I'll say, "No, actually, we have a year and a half left." The other day I heard him say "a year and a half," and I said, "Oh, it's not really a year and a half anymore."

I think one of the most challenging aspects is coming in at this particular point in time when there's not that much time left, and there's so much that Mike and I want to accomplish. I would certainly hope—this is just my own hope—that the next administration keeps Mike Griffin on, because I just think he is a phenomenal leader, and he is the right person for this agency, particularly at this time when it is, as you said, a turning point for the agency. This is a hard time for the agency, and they need somebody like Mike Griffin here. So I hope that he's able to continue on.

In terms of the biggest challenges, we will obviously continue to make progress on the programs and projects that are in front of us. This gap and transition between the Space Shuttle and Orion/Ares I is one of the biggest challenges that we face. Another challenge that we face is our outreach and our dissemination of information about NASA so that the American public and also our stakeholders in the White House and Congress have a much greater understanding of what NASA engages in and how important it is for this nation.

DICK: I was just thinking, Mike yesterday showed us his book when he was seven years old that inspired him, *A Child's Book of Stars* [by Sy Barlowe]. Were you inspired that early on, or was it later that you were inspired about space?

DALE: I think it was later that I was. Definitely I was inspired as a kid, but I didn't have the same desire that he did, as many people do, to become an astronaut. Definitely a coolness factor about astronauts when I was little. My intense interest in either working at NASA or somehow being affiliated with aerospace actually came in law school, and that was because of a law article that I wrote on remote sensing satellites. You probably know the story that I had applied to

NASA for an attorney position just as I was coming out of law school, and nothing came of that, and that was fine. But the reason that I came up to Capitol Hill was to either pursue space or telecommunications policy work, and eventually, after a year on Capitol Hill working on Public Works and Transportation Committee, there was an opening on the House Science Committee, and that was the start of my progression into space work. And now, after all these years, I'm finally at NASA.

DICK: What year was that?

DALE: The transition over to House Science Committee was 1991.

WRIGHT: We thank you for your time today. Is there anything you'd like to add or any subject that you've thought about that we didn't get to cover?

DICK: I'm sure she could go on and on. [Laughter]

DALE: I don't think so.

WRIGHT: Well, we thank you again.

DALE: Thank you.

[End of interview]