NASA AT 50 ORAL HISTORY PROJECT
ORAL HISTORY TRANSCRIPT

LESA B. ROE
INTERVIEWED BY REBECCA WRIGHT
HAMPTON, VIRGINIA – 1 NOVEMBER 2007

WRIGHT: Today is November 1st, 2007. We are at the Langley Research Center in Hampton, Virginia, to speak with Center Director Lesa B. Roe for the NASA at 50 Oral History Project. The interviewer is Rebecca Wright, assisted by Sandra Johnson. In preparation for the space agency's 50th anniversary, the NASA Headquarters History Office commissioned this oral history project to gather the thoughts, experiences, and reflections from NASA's top managers. The information recorded today will be transcribed and sent to the History Archives in Washington, D.C., where it can be accessed for future projects.

Thanks again for providing us some time in your very busy schedule. We'd like to begin by asking you to briefly describe your background and how you came into the current position.

ROE: I came into this current position after a journey through NASA. I started as a co-op [cooperative education] student, and it's something that I highly recommend to kids along the way. But then I went to industry right out of college, so I had a little bit of industry experience starting off as a NASA employee.

I started at [NASA] Kennedy Space Center [Florida] as an engineer in Shuttle communication systems. I checked out the orbiter communication systems and made sure they were ready to go for flight. I worked all the flights and sat in the firing room, so that was very exciting times.

I moved into payload project engineering. I was fortunate to work numerous payloads involving the test and checkout of all systems on a payload for flight. This work was also exciting with payloads like Space Radar Laboratory and Hubble Space Telescope. Other payloads included ATLAS I and the Russian docking module that went to [Russian Space Station] Mir for the Shuttle to dock to Mir.

So all of that just was very, very exciting, including my work on the International Space Station and the Canadian arm that is on the International Space Station today. Working with the Canadians, working with the Russians, and working with the Italians on the logistics modules, really is a one of a kind experience.

I then moved to Houston [Texas], spending four years at [NASA] Johnson Space Center. There my work was focused on managing large programs from an agency perspective, and that was very exciting. I managed the International Space Station Research Program. I was able to be a part of the very first experiments going up to the International Space Station, the very first research facilities going there.

Then I moved to a research center, Langley, so that was quite different as well. At the same time I switched to center management rather than program management. So, as I said, I have been on a journey across multiple centers, and moving from shuttle systems to projects and programmatic management to center management.

WRIGHT: Give us the scope of your responsibilities here at Langley and what all that you're involved with.

ROE: At Langley I'm the Center Director, so I manage all aspects of the institution that we call the Center of Langley, so that means everything from making sure that the facilities are up and running and maintained to making sure that we have the right workforce balance that we'll need to support the missions. It's truly making sure that we implement the agency's missions, so we're the folks that make sure it happens. It takes facilities, skilled people, researchers, engineers, scientists, business functions--procurement, legal, human resources, financial--all those things come together in Center Management.

WRIGHT: Your center has a very long tradition. In fact, we know that you just celebrated an anniversary celebration this past weekend.

ROE: That's right..90 years!

WRIGHT: How does your strategic vision for the next years tie in with traditionally what has been done here, and then how is it different?

ROE: Well, our history has been very exciting. We were able to revisit some of that this weekend, as you mentioned. We started off as primarily an aeronautical center. We were the first civil aeronautical facility, starting with around eleven folks working here, and the focus was solving the problems of flight. That was our challenge, and quite frankly, as you think about that today, that is still our challenge, to solve the problems of flight, whether it's through and in our atmosphere or in other planetary atmospheres. So it's interesting how that thread has been there through all these years.

But the center itself has had many missions over time, and that aeronautical base actually led to us into being the center where the Space Task Group started; so our space program actually started here. That strong base, and I actually heard a quote from Jack Schmitt, Harrison [H.] Schmitt, when he was down here, where he said he really feels like our ability to get to the Moon in such a short time frame came out of that base of knowledge of that forty years of experience in aeronautics here at Langley.

So that was really positive and that also led to the first Orbiter and lander on Mars, with Langley leading the Viking Project here. So we've had kind of a broad experience where aeronautics has been the base all the way through those 90 years that we've existed.

How does that play into today? I see that aeronautics will always be the core that leads us forward as we move forward. But once again, we've diversified into space development, while maintaining our fundamental aeronautical research. The research actually takes us further out. We look at more revolutionary approaches, and then those play into the space development. We bring that knowledge into development of space flight including scientific missions and instruments, so it's a nice marriage that works very well together.

WRIGHT: Budget is always on the minds of Center Directors in those projects. Do you feel in the future that your budget will allow you to expand into new areas as well?

ROE: Yes, budget is always a challenge. The balance that we have at Langley will allow us to expand into new areas. Our fundamental research in aeronautics provides new knowledge in those far-reaching technologies that we're going to need for the next-generation air transportation system that the nation must have.

In the exploration arena there is a technology program that's actually managed here at NASA Langley, and that budget is focused on the technologies that we'll need for the future in space. So I think it will take a few years as we're working through Shuttle retirement to actually get to where we're able to have more funding in some of those far-reaching technologies, but I do see that as something that will happen over the next few years.

WRIGHT: You have a center here that has experts that deal with the structures and materials as part as the NASA Engineering and Safety Center. How does that bridge kind of the past and the future of what you're doing here at the center?

ROE: The structures and materials competency really has been a core of Langley since the beginning. It is a base of our aeronautical expertise as well, so a part of our expertise in aerosciences truly stems out of our knowledge of structures and materials. The NASA Engineering and Safety Center utilizes that expertise in structures and materials, and also the agency utilizes that knowledge in structures and materials.

The recent roles that the Agency just rolled out this week show Langley as the lead for the lunar lander from a structures and mechanisms standpoint. We're also leading structures and mechanisms for surface systems in exploration, so again that base is being called to help the agency move forward as we head on back to the Moon.

WRIGHT: You've been involved with NASA since the early eighties, and as we've mentioned, the tradition here at Langley is far beyond that. What do you believe that NASA's impact on society has been through these years, as you've experienced it in your own personal experiences

and then as you've seen other people tell you the experiences that they've had, the impact that it's had on society as a whole? And what do you believe it will be in the future?

ROE: Well, there's the more simple answer of, of course we have had economic impact. The impact of a center like Langley is 2.3 billion across the nation. Those are the simple answers.

But more importantly, the impact of technology is the largest societal impact. As we advance our mission, and continue to explore, challenges arise. Technology solutions to these challenges help the nation as a whole in the end. They change the nation into something greater. It's something you can't promise or know exactly but as you're going through that development, some of those things, we call spin-offs, will occur. This advances our nation and helps to make our nation the leader in the world of these kinds of technologies.

There's something in NASA that goes beyond that. I feel like it is truly the spirit of exploration. What our nation looks to NASA for is to make dreams a reality. We actually live the dreams of our nation. If our nation can dream it, if we can dream going out beyond the stars, NASA actually makes that happen, makes that a reality.

So we inspire. We inspire the nation, and I think that's an important role, the most important role. It's something that's difficult to measure; for example, how many children, how many engineers working all across the nation, were actually first inspired because they watched the first footprints on the Moon being made. You can't measure that, but there is a national spirit, and there is something that comes out of that that just truly raises us to the next level.

WRIGHT: Speaking of inspiring, you are in a very unique position in the NASA management level as one of the few female Center Directors in the history of NASA, as well as the only

female Center Director at the moment. Can you share with us what the challenges and, of course, some of your successes have been, and just tell us about the experiences of being in this very unique position?

ROE: Well, it's quite an honor to be in this position and to be able to be in the key leadership role of such a wonderful center like Langley Research Center which is the mother center and goes back ninety years. So it's an honor to be in that role.

Now, to be in that role as a woman, as the first woman Center Director of Langley in its ninety-year history, and quite frankly, I think the second woman Center Director ever across all ten centers, is something—it's kind of interesting. I don't think about that on a daily basis, because I'm just one of the ten center directors that are trying to make our mission happen. I'm working together with my peers, and so the fact that I'm a woman doesn't really come into play, or it doesn't even come into the thought process. I'm one of the folks that's in there working hard to make a difference, and I'm not treated any differently.

But when I do think about it, I am proud that young women out there, or women across the Agency see that they can do it. So in a sense I've become a role model that folks can say, "Hey, she did that, and that means I can do that." So in the future I fully expect that we'll have many more women that will be Center Directors, and we're already seeing many women now as Mission Directors. So I think that it's breaking some glass ceiling that many feel exist and breaking those myths. It is proving there really isn't a glass ceiling anymore, and anybody can do it. If you want to do it, don't think that you can't.

WRIGHT: What are some of the lessons learned that you would share with not just the women that are coming up hoping to seek higher management positions in the agency, but just overall, some of the lessons that you've learned that you've been able to apply in your leadership position and management principles as well?

ROE: I've learned too many lessons to mention! What I have learned along the way is that all of the NASA centers have a unique capability to offer for our missions, and it truly is a remarkable capability. What you don't really see if you are in an individual center all of your career, you don't always see that capability. What I've learned as I've worked at each center is we are stronger when we utilize all of these talents, so much farther than we would by focusing on one individual center alone.

I have also learned that great leaders are viewed as great from above their position and from below their position. I have learned a lot about the character of individuals by talking to people they supervise.

WRIGHT: Do you believe that this new governance model where the centers are reminded that they're there to provide for the programs and not the other way around—we've heard Mike [Michael D.] Griffin mention that a number of times—and the management communication levels that you have now, do you believe that these are things that will help people understand that the centers are all working together to accomplish the vision?

ROE: I think it will help people understand that we're working together. I think it's important that there's a check and balance, and so there shouldn't be an Agency where centers have the

overall power and, quite frankly, developing capabilities that the missions may not need. We just don't have that kind of money within the agency where a single center should go off and just develop something just based on their own desires.

But in the same way, the missions need the institutional capabilities to be able to get the missions done. The missions typically are more near-term focused. A lot of times programs are focused on the here and now, and they don't want to pay for anything above and beyond what their individual project or program needs. So sometimes they may be willing, inadvertently, to sacrifice a capability that would be needed in the future.

So you have to have that—some call it "healthy tension"—to really, truly be able to have all the capabilities you need, and getting rid of capabilities that you really don't need, but carefully assessing those along the way so that we always have the right capabilities that we'll need, not just now but for future programs and projects.

WRIGHT: We talked briefly just a moment about budgets. In the past in the NASA Agency budget when it got a little tight here, and there was some talk on different levels of possibly not doing as much in aeronautics as has been done in the past. Being the Center Director of the leading center for the Agency, how do you feel, or how would you emphasize to someone what the importance is to keep our hands involved in that field as an Agency?

ROE: Aeronautics has been dramatically reduced over the years. However, it is very important for our future. We must continue to study the problems of flight for our nation; it is crucial for space exploration. We're going to need that as we go to other planets and need to get large

masses for human exploration to the surface. We also need that knowledge as we develop new space vehicles which must fly through our atmosphere.

So all of that, the base knowledge that we have in aeronautics, is fundamental to all of our missions, and it's also fundamental to the nation, because we have key challenges in the air transportation system for the future. The challenges we face today in air transportation are as large as any we have faced in history. We're going to need to revolutionize our air transportation system to be able to deal with those challenges and that includes revolutionizing our air vehicles with dramatic reductions in noise, emissions, and dramatically improved fuel efficiency.

So these advancements must occur and that is why NASA was created.

WRIGHT: How will there be changes in the partnerships with private and public sector, and how those will affect Langley even more in the future?

ROE: There's always been strong partnership at Langley with other agencies and with academia; that's how we have been successful. We're even more focused on that as budgets are more flatlined in aeronautics, we must pull on the capabilities of our partners. They bring something to the table, and we bring something to the table, and together we'll have a greater outcome in aeronautics, so I see more partnerships as we move forward. We're already starting to see that increase and moving back to that.

That was a key part of NACA [National Advisory Committee for Aeronautics] before Langley was NASA. We'll continue to stress the importance as we move forward. It will be key.

WRIGHT: How has NASA changed over the time that you've been here, in general, because you have had such an opportunity to be able to move from one place to the other, but then also I your own area of expertise, how have you seen things change in NASA?

ROE: From a Center perspective, we have seen a dramatic change from a research focus to a balanced research and development focus. We're close to being equal between space and aeronautics. So I've seen a broad change with regard to our work.

As I look at my own career, though, and what has happened in my own career, the greatest change that I've seen, and more recently, is really in human space flight. As I came in, Shuttle was just starting to fly, and the focus was very much on low-Earth orbit and flying Shuttles and building an International Space Station. I feel that the consistent thing is the people and the excitement of the people that work in NASA. However, I think our workforce and the nation needed the vision to take humans further---to continue to explore outward. Where was the next step? So the greatest change has truly been having this Vision for Space Exploration.

We haven't lacked that in the science arena. Science has continued to expand and reach out and go farther and farther, and that has always been the vision in the science mission.

Now we're taking humans there as well, and so I think that's really reinvigorated and reinspired all of our engineers as we continue to reach, and I think that's made a huge difference. That's been the biggest change that I've seen during my career--moving from near space to truly expanding our reaches to the Moon and beyond, with humans, with human exploration.

WRIGHT: Following that trail of thought for one more step, give us your thoughts on the relative importance of human and robotic space flight together, and how that might affect what you're doing here at the center.

ROE: You have to have both. You cannot just suddenly decide, "I'm going to send humans to Mars," and think you don't need precursor robotic-type missions. The robotic missions must go first to study. We must learn more about the atmosphere, radiation protection, and learn more about getting large masses down to the surface of Mars, and we're playing a role in that at Langley.

We're working on the Mars Science Laboratory to make sure that we are instrumenting that flight so that we can expand the knowledge base of getting large masses down to the surface of Mars. We are working on radiation protection.

There is much to understand, many challenges to solve, before we can just suddenly embark on sending a human crew to Mars.

WRIGHT: Over the past few years there's been a lot of talk about NASA's culture. Of course, a lot of it came out after the [Space Shuttle] *Columbia* [STS-107] accident. Because you have worked at so many of the different centers and so many of the different projects, can you give us your perception of NASA's culture and how it has changed over the years that you have worked in the agency, or maybe how it hasn't changed over the years sine you've worked?

ROE: There's always a can-do spirit; that has not changed. I think if you can dream it, our folks feel we can do it, and that's always been a part of NASA.

I have seen change, especially dramatically after *Columbia*. What I see with that is the way that we get ready for our missions, get ready for our launches, where there is more of an openness to bring forward technical problems, to challenge. I've seen that in the last couple of Flight Readiness Reviews, where there is clear ability of engineers to bring forward concerns, get those presented, and talk through those. Then certainly there always has to be a decision made, but a more careful weighing of those risks, where I think it was more difficult to stop the momentum. "We're going to fly no matter what."

Though I think within NASA we've always looked at all the problems, but I think with the NASA Engineering and Safety Center there is a more careful independent look along the way at all of those technical problems and make sure we're studying them. There is a place for someone to ask for another look from experts, making sure that there's more of a check and balance than I've ever seen in the past.

WRIGHT: Well, we are moving through this pretty quickly, and before we get to the end of our time with you, I wanted to ask you to share with us why you would encourage someone to enter or begin a career with NASA. You started out as a co-op and have a promising future. Why would you tell someone who is looking for an opportunity, why would they want to come in this direction?

ROE: There's nothing like what we do in NASA anywhere. It is exciting work. When you talk about your work with other people, your eyes light up and so do the people that you talk to. I've had the privilege of going to training where I'm at universities and other people are there, and I

have shown videos of some of our work, and everybody in the room was just, "Wow, you have a cool job." So it's an exciting job, and it's an exciting job every day.

Again, reflecting on everything for our 90th anniversary here and hearing many, many stories, people don't come here for the money. It's truly the personal satisfaction of doing something that we thought was impossible, and expanding our knowledge, the human knowledge, of what is out there in our universe and beyond and other galaxies. So it's a dream job, and it's something that I've been very, very fortunate to have spent an entire career doing what others dream. I would just highly recommend it to anyone, and I do. I talk to kids about it all the time. I try to share that excitement with them.

Plus the team work and the camaraderie and the accomplishment when you do that, when you land that vehicle on Mars, when you make a discovery that we didn't know about before. There's nothing like it. So that's why I would tell them to come to NASA.

WRIGHT: Now, you have additional programs for educational opportunities as well for students.

ROE: We do. We have a number of programs here, from K [kindergarten] through 12 and then on into graduate school. We have pre-service teacher programs which help teachers to learn to teach STEM. We started the distance learning program which reaches schools in the most remote locations and lets them interact with our engineers. This helps them see themselves as engineers or scientists.

Some of our folks go out to Explorer Schools and utilize technology to bring NASA into the classrooms and help them grasp, "Well, what is a wind tunnel test?" or "Why do you do

that?" So by actually talking to the folks that are doing that work here, they can have a conversation and ask questions.

We've seen schools turn around, schools that were in the bottom of the pack. I've heard principals tell me these stories and how getting involved with NASA moved the school to the top in the state, because kids realize that that's not something just somebody else does. "That's something I can do, and here's how I do that." So that's another thing that's just a huge point of satisfaction.

WRIGHT: Yes, very rewarding.

ROE: Very rewarding indeed.

WRIGHT: Before we close, is there anything else that you would like to reflect on as NASA enters its next 50 years of discovery and exploration?

ROE: No. I look forward to being part of a leadership team that's going to make the next dreams a reality and inspire the next generation in making history. It is pretty cool to realize "I'm making history – we are making history." Not many can say that as they go to work each day.

WRIGHT: Well, thank you. That's a good place to stop. We appreciate it.

ROE: Thanks.

[End of interview]