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EDITED ORAL HISTORY TRANSCRIPT

LESA B. ROE
INTERVIEWED BY SANDRA JOHNSON
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JOHNSON: Today is October 30th, 2018. This oral history with Lesa Roe is being conducted in Dallas, Texas, for the NASA Headquarters Oral History Project. Interviewer is Sandra Johnson, assisted by Jennifer Ross-Nazzal. I want to thank you for talking to us again today.

ROE: Absolutely.

JOHNSON: The last time we talked we ended with talking about *Columbia* [STS-107 accident], then your move to Langley [Research Center, Hampton, Virginia]. You talked about those first positions as Associate Director and then Deputy Center Director. Then you mentioned that [NASA Administrator] Mike [Michael D.] Griffin asked you to be Center Director and he said that he didn't know you personally but he knew people who knew you personally, so he felt confident that you would do a good job with that.

If you don't mind, let's just talk about that time at Langley when you became Center Director. What was your vision when you took that role and took on that position? What was your vision for Langley at that point?

ROE: Right around the time that I accepted the role we were going through a difficult time and there was a downsizing of research. As I was coming in, we were facing maybe a 1,000-person

reduction in force. It was a lot of stress and turmoil around research and NASA. Of course Langley being a research center, that was an issue.

I had come into NASA Langley as the Associate Director as I mentioned. The first thing in that job that I was asked to do by Center Director Roy [D.] Bridges was to reorganize the Center. I had moved out on all of that, we had decided on that new structure, we did some nontraditional things by having people compete for positions. There was team building associated with that reorganization. When I was asked to be Center Director, I'd already been on that path, but my goal had been to build a team and to lay the foundation of where we needed to go as a research center for the future. During my tenure, which was nine years as Center Director—I became Center Director in 2005 and then I went to DC around 2014—we focused on building leadership, focused on leadership, leadership behaviors, making sure that we weren't thinking in stovepipe fashion but thinking as an integrated team. I expected everybody to integrate across because we needed to do things from a multidisciplinary approach and not just single stovepiped research. We wanted to bring solutions to the Agency with that regard. That's where we were focused, and paving the way and leading the way for where aeronautics should be going in the future, for one thing, but then also how we needed to be thinking in space technology.

We knew the value that we could bring to the Agency with regard to research. We brought a depth of knowledge that was important to operations, but operations didn't necessarily know that. Johnson Space Center [Houston, Texas] didn't know to reach to us for that expertise. We had grown apart as Centers over the years. We had hired new people into the Agency that didn't understand what each Center even did or the value that each Center could bring to a problem.

That was the basis of what was going on with the NESC [NASA Engineering and Safety Center]. The NESC was formed based on the lessons learned from *Columbia*. NASA Langley and other research centers helped to understand what happened with *Columbia*. Having that depth of knowledge of the physics of reentry was critical. The NESC provided that expertise that Centers could pull on whenever you had a problem that their engineers and scientists didn't understand. We were a part of that solution. As a team under my leadership, we laid the foundation for where we should to be going in aeronautics and worked really closely with the mission directorate at Headquarters [Washington, DC] to get those seed ideas into our mission planning.

That's played out into the aeronautics program of today, but it wasn't necessarily accepted back then in the start. By working with our team, laying that roadmap out, telling that compelling story, it started to become where we were heading from an aeronautics standpoint.

JOHNSON: Some of that was starting when Roy Bridges was still there, right?

ROE: Yes some of it started with Roy Bridges in the reorganization of the Center. Roy was very strategic and worked hard on building a team. I enjoyed working under Roy's leadership. We continued on that path with me as Center Director. Each of our strategic retreats, we became stronger and everyone on the team was a part of the visioning. Even HR [Human Resources], because you needed to know the hiring you needed for the future. It all tied together in an overall strategy. We needed to evolve to a more computational strategy rather than experimental test—and wind tunnel-based experimentation. This provided the foundation of what did we need to do in our wind tunnels to eventually work yourself out of wind tunnels, so that you would

advance. If you could advance your models to a state where you didn't need to do experimental testing in certain regimes, then maybe you could close down some of the infrastructure. It was thinking hard about our infrastructure.

Also during that timeframe we laid out the vision for Langley's infrastructure for the future. We had people like Charlie [Charles E.] Harris, who was our head of research [Director of Research and Technology] at Langley. He walked every square foot of NASA Langley to figure out what labs were of value, which things we wanted to phase out. We put together a revitalization plan for the whole Center and briefed that to the Administrator. By then Charlie [Charles F. Bolden] had come on board. Charlie loved it, and actually rewarded that thinking in investment in some areas where he said we should accelerate that.

One of those things that we accelerated was the computer facility [Computational Research Center] that we named after Katherine [C. G.] Johnson. We advanced that facility by a couple years because of the support that we received from the Agency in this revitalization plan. It was a whole plan, which no one was doing then. It was focused on shrinking our footprint, to have a stronger footprint and one that is tied to the Agency mission. You could see that in the product that we had developed. That was a lot of work.

Then we did the same thing from a workforce standpoint. First we focused on infrastructure and then we focused on the workforce piece with a similar approach. That part was finishing up as I came up to the Agency level.

JOHNSON: You mentioned before that when you first came in people thought, "She's here to get rid of people; she's here to reorg and get rid of people." Once you became Center Director was it still hard to convince them? You were forming these teams and trying to work toward that

vision you had. Was it hard to bring people along with you in management and also the workforce? Was that an issue?

ROE: I think it was. It was hard at first, but it's part of building trust. That's part of working on our leadership behaviors, building trust, being inclusive, being transparent. Anything I went to at an Agency level, any of the meetings with Mike, I would share with our team. None of that ever got out on NASA Watch [Keith Cowing website blog about NASA]. We had a trusted environment, but it was important for them to understand the background around the decision, why Mike was going a certain way, why Charlie was going a certain way. Being able to share all of that with them and include them in that helped to inform what we needed to do at the Center level.

I think all of that, it takes a while. Over the years I think we had just such an incredible team. I think that's my biggest legacy was the team that I built at Langley, and you could see that when I left Langley and went up to Headquarters. I don't mean "I." It takes a lot to build a team, but when I went to Headquarters, the Center kept running very very well. That meant I did my job. We had built succession planning; we had built a team that worked together well.

It was so fascinating. When I first started at Langley it was, "My job, and you're trying to take away my job." People weren't sharing. It was very stovepiped. By the end of my tenure or along the way it changed, where people would come to me and they would say, "If you're thinking about somebody to move around and try something different, I'd like to do that."

People became open to—they got excited about—doing different things. That was really really healthy. So people could put themselves in each other's shoes. It was no longer around sideswiping the other guy, or whatever it is that comes with a stovepiped organization. We tried

to think, wear an Agency hat, what would be important, even if it meant giving up something at Langley, because it would make the Agency stronger as a whole. That was the whole thinking that I would say I drove while I was there.

That's the way I always thought, and my team thought that way. Through the work that we did I think we changed the whole mindset there. Now everybody has moved up to Headquarters. As you can see, Steve [Stephen G.] Jurczyk is now in the COO job. He was my Deputy for nine years for the whole time. Rick [Richard J.] Gilbrech was my Deputy for maybe six months and then Jurz was it for the whole time. He's now pulled up to the Agency level.

Jeff [Jeffrey M.] Seaton, who was my CIO [Chief Information Officer], has now moved up to the Agency level. Cathy [H.] Mangum I know has been asked to do a number of Agency level things. Charlie was always pulled on at the Agency level, Charlie Harris, when he was there. Jill Marlowe has served in agency roles. People recognized that there was talent and there was leadership. I think it's because of all the work that we did together.

JOHNSON: You mentioned the NESC, and of course your husband [Ralph R. Roe] was in charge of that. It started in 2003.

ROE: He was in charge of the NESC. Then he moved up to the Chief Engineer job. Yes.

JOHNSON: It was a separate entity.

ROE: Yes. It reported directly to Headquarters. It was a tenant organization at Langley, and reported directly to the Chief Engineer. The Chief Engineer of course reports directly to the Administrator.

JOHNSON: That was formed because of *Columbia* as you mentioned but also the Vision for Space Exploration announcement was in 2004 [by President George W. Bush], which was right around that time.

ROE: Right. I was in on all of that. Let's see. When did Griffin come in, '05? Must have been 2005.

JOHNSON: Yes. It was April.

ROE: Right when I became Center Director. He changed out almost all the Center Director positions. Most of them if not all of them. Yes, the Vision for Space Exploration came out. We were engaged in what Langley would provide to the Vision for Space Exploration. We lead Ares 1-X from NASA Langley. The kind of work that we had done in lightweight structures, the kind of thing that we had done in, again structurally based, but inflatable habitats was something that we were asked to do, bring that research into the vision. We did work in human factors. Things that we were doing in radiation protection, the lead was at Johnson, but we were on that team, and had done a lot of work over the years with that regard. We supported the Marshall Space Flight Center [Huntsville, Alabama] for research and test on SLS [Space Launch System].

JOHNSON: There were a lot of changes going on all across the Agency at that point, not just at Langley. Do you feel like that stovepiping was something that was a legacy of Langley from years past?

ROE: Yes, it had grown some in the years. Things change over the years, and a lot of that reflects the leadership maybe. But yes, I've seen that at a lot of Centers by the way where you don't leverage the team. You're not looking across the Agency. You don't actually know what is going on across the Agency.

I organized the Center to drive integration. The organization was very flat at Langley, where you went straight from director level to branch level. There were no division chiefs. We were a very flat organization.

We talked about adding division chiefs back, along the way. We would ask employees. Overwhelmingly the feedback was don't change it. They really liked that flat structure. Communication was better that way. I think that was something. They may have added some division chiefs now, but it wasn't something that I was putting my fist down that I didn't want it, it was what would best serve our organization.

You asked about the Vision for Space Exploration. The NESC led things out of Langley. In particular, alternative models like MLAS [Max Launch Abort System] happened around that time. That was under Mike Griffin, where Ralph led an approach to a launch abort system. We had the mainline launch abort system, and then the NESC ran an alternative concept all the way through launch to try to test out some different ideas. Actually I'm not sure, but I think SpaceX is using that kind of approach. Maybe Boeing picked that approach as well. The point is it was

trying out some—and Mike ran that deliberately to try to get some alternative thinking and build some rapid approaches to different systems.

JOHNSON: There were other things going on. As you mentioned, you were trying to flatten things out but also concentrate things. There was an effort to get people outside of NASA to use the Langley facilities. You had an open house or you brought in people in industry and congresspeople to come through. That hadn't been done before, I don't believe, until then.

ROE: I don't know if it had been done, but certainly not in a while. We definitely were doing that. We were trying to think of alternative models where people could use our research facilities. We turned one of our wind tunnels over to in this case to Jacobs [Engineering Group, Inc.], and they were running it, and we put no NASA money in it. That turned out to be a huge success as well; an effort that I had started when I was at Langley because the funding model was not a good model.

It was a death spiral model that we had entered where there was this assumption that if you need it. It was a pure market-based model that was put in place that didn't work for a wind tunnel—because if you need the tunnel, you need it, but then you're not going to need it for a few years in some cases. For Mars missions they need it to test out concepts, and we found a number of issues where missions would not have been successful through our wind tunnel testing. Mars landings would not have been successful without doing the testing that we did, and there's lots of data on that. Science would inherently not think they needed the wind tunnels, or they didn't need to put any money into the wind tunnels. But when it comes time to do the testing for entry, descent, and landing, when you've got a different concept coming in, you need

to test those concepts, and you don't always understand the interaction that you're going to have in the atmosphere, and that's exactly what the wind tunnel would do for you.

That market based model really didn't work, and it also didn't work well for research. The successes that we had in our history occurred when somebody was able to have an idea and come and test it in a tunnel. The market-based approach wouldn't have those seed corn ideas that you'd be able to test out. Because the only people that could afford to do a test in a wind tunnel would be an SLS, a Space Launch System, that's the only people. So you were killing your seed corn ideas.

Finally when I went up to Headquarters, we designed a different approach. We explained this wasn't working and we could move to a new capability-based model. It was the technical capabilities model. A model where you were evaluating your facilities and then funding those things you need. We did that with our wind tunnels and it seems to be working well. New discoveries are coming out of this shift in mindset for capabilities.

Our researchers like the model much better. I had Air Force people come to me and say, "Thank you for doing that, because we're able to try out new things and do some different things that we would have never been able to do." It's really important. People don't understand that that research and those ideas that you have don't make it into a vehicle until sometimes a decade later. But if you're not doing them, you don't have anything a decade later. That's the kind of thing that I also am proud of that we were able to do, but it's hard.

I understand it, because I've been a program manager, I get how missions think, and they just want to pay it by the yard. I just want what I've need right now. They're not thinking about the future, they only think about what I need right now. If I get there and I need it, I'll get it at that time. Well, it's not like you can create a $1 billion facility. So, that's a hard mindset to deal

with, and it's just near-term tactical thinking at the expense of long-term thinking. You have to have both.

A lot of people say, "You just want to keep everything." No. It wasn't that. We demonstrated at Langley how you can downsize, how you can reduce 40 percent of your infrastructure, if you're thinking strategically, and if you're willing to let go of some things.

That's the hard part. I can tell you from working at the Agency level people don't want to give up anything. Just knock-down, drag-outs with people on just looking at the data on facilities. I hope that NASA continues to do that work and doesn't fall back now that we don't have some of the advocates like [former Acting Administrator] Robert [M.] Lightfoot and myself that had worked at a Center, got it, and wanted to take it forward. Jurz gets it, so I hope that'll continue.

JOHNSON: Hopefully. But he's somewhat limited too.

ROE: He's limited too. There's only so much money. Sometimes people will give up the future for the problem of the day. I've seen it way too many times. I saw it in [International] Space Station [Program]. I saw it when I was at Johnson Space Center working [as Manager of the ISS] Research Program. I saw how Research Program money was taken to fund operations of Station. I know it happens, I've seen it happen.

JOHNSON: Yes, it has, we've seen it happen. The funding for the Center while you were there, was that shrinking the whole time? I know you were doing a lot, like you said 40 percent of the

infrastructure during your time. Some of the wind tunnels were being demolished, and you had plans to think about the future, but was the funding that Langley was getting shrinking?

ROE: I think our funding was right around $700 million to $800 million range. I don't think it shrunk. I think it was more around how we used it. By demolishing things and really proactively thinking, you could save money and reinvest in newer more efficient, modern infrastructure. You could build a new facility, which was much more flexible and was more multiuse for much less cost, for 25 percent of the cost, if it was LEED [Leadership in Energy and Environmental Design] and you were thinking hard about ways to—so it was much more efficient.

We were able to show that and reinvest that efficiency in the new infrastructure, and we were able to make that model work. The plan that we laid out paid for itself by the time it completed because you were saving so much money and reducing your operational cost. So it was a really good story.

JOHNSON: I was reading around 2010 the NRC [National Research Council] report came out about Langley. They had some positive things to say but they also made some statements about the contractor force and some of the labs and their capabilities. You had responded to that in a letter, and you talked about repair by replacement and New Town.

ROE: Yes. It started as New Town and then it became more extensive than just New Town to be our whole VITAL [Vibrant Transformation to Advance Langley]. We called it VITAL. It was a 20-year plan for the Center and what we were going to move forward with. It shaped our master

plan for the Center. It was a really comprehensive revitalization plan. That New Town was just the first seeds of it. In New Town, our first building was an Administrative Building. We did that because it allowed us to tear down some of the oldest most inefficient center buildings. Believe me, I heard from all the researchers about the fact that our first building was this administration building, and they didn't understand the ROI [return on investment] and why you did what you did.

I tried to tell the story. But it was really hard. They wanted you to build a research facility first, but that has quieted down because of the buildings that have come since. That was again thinking that "Okay, we're going to get this one building and it'll stop, there won't be any more investment, we don't trust that there'll be." Because there hadn't been. I think when we did our administrative building it was probably in the '80s was the last time that something had been built at Langley, I'm pretty sure. I could be wrong. There just hadn't been a lot of investment in building at the Center, and people didn't trust that there would be.

Since then there's been a steady renewal—we did the multipurpose building, cafeterias, and innovative space, and the computer facility. The plan has happened. They're now building a big research building that will consolidate a lot of old labs.

The whole Center, I had people come to me, they were like, "Wow, the whole face of Langley has changed. It looks completely different." There's a great video that showed in visual form what we were doing. You'd see all this come down, you'd see this come up. It's happening. I'm so excited, because we did that all during my tenure as Center Director. We laid all of that out and implemented a lot of it.

JOHNSON: Like you said, there was a lot of suspicion at first that it would just stop. How did you keep the people at Langley motivated or help them to understand that no, it wasn't going to stop? How would you promise them that that they would believe you?

ROE: It was communication. It was showing them what we're doing. It was telling the story over and over and over. It was meeting. I would meet with researchers. Just walking around and telling the story.

Then proving it; they'd see it happen. We'd get the next building in the budget based on that story. Having the Administrator down and talking about how he liked what we were doing. Just all kinds of ways that you're reemphasizing the message and what you're doing.

JOHNSON: Just communicating with everybody, the workforce. You had the facilities reduction program, which you talked about, and some of the demolition. But those wind tunnels were considered—

ROE: Oh, one of the good things to do on the demolition piece. People do have trouble letting go. What we learned to do along the way that I think was really really successful, and that is celebrate the successes of that building. The Full-Scale Tunnel came down, which had just a tremendous history. We would celebrate those successes when it came down, and we would take pieces of that and put it in our new buildings. We had blades from the 16-Foot Tunnel in our new buildings. We would put the history on the walls and tell the story. We did a lot of that, and factored that into—each of our new buildings has had some of the history in it and captured some of that, and I think people really appreciated that, because it wasn't saying it wasn't valued.

You celebrate those successes and have them live on in the new infrastructure.

JOHNSON: I read that you had taken salvaged artifacts and moved them. But they were historic. You were talking about the Full-Scale. It had a National Historic Landmark designation. How was that process of removing that, especially since it was designated and then having to take that building down? How did you work through that process with them?

ROE: It was a lot of work with the historic preservation society. You had to work really closely with them, and then bring in various people to help preserve pieces of it. That was all part of the plan. We did that through the Smithsonian [Institution] and others had come in. It was just a lot of work. Our facilities guys did a tremendous job doing that work, staying closely tied, so that nobody put in any blocks to taking down the building.

But I would say the history capturing within our new buildings wasn't necessarily a part of that. It was more about the legacy, and honoring the legacy of that great place. I think that was what was most important. That was a big part of the culture of our Center.

JOHNSON: Was there any pushback from the historic preservation people in Virginia?

ROE: From my memory we worked pretty well with them, and we never had any roadblocks. But I think it's because we were just so tightly working with them.

JOHNSON: Keeping them informed.

ROE: Keeping them informed.

JOHNSON: You mentioned that you had these celebrations about the buildings. Were there other things that you did during that time? Because things were changing. The footprint of Langley was changing. There were tunnels that were on the Air Force side that were being demolished, and I think that property was being given back to the Air Force.

ROE: Yes. Some of them were ours. Right.

JOHNSON: Yes. There was a lot going on. The [Space] Shuttle Program was ending. The wind tunnels were going away. You did have a workforce and you had contractor personnel and different people I know at a lot of Centers were concerned about not having a job at the end of things. How did you keep them motivated through that time to keep pushing forward and to look to the future? Because you were building this for the future.

ROE: Yes. You tell the story of the future. A lot of times we forget to tell the story of the future. Our story had that whole future built into it where we said, "This is what we're trying to get to." We did that with our leadership team. That's what I talked about with our retreats that we would have, where we all worked. We would vision, "What does the future look like."

Our leadership team believed in that future. You'd visualize the future. Then you'd back from there. What things need to happen to enable that future? We'd work our way back to today, so that you would see where you were going, and maybe some key things, and you'd have key decision points. It's not like you know the future, but you can vision. We had key decision

points in our VITAL plan, because we said, "Depending on the state of technology at this point and if CFD, computational fluid dynamics, has evolved to the right spot at this point, we might be able to take down this tunnel."

It was a key decision point. What we would do is you knew that you had those key decision points built in. You might decide no, we're not ready yet. That's how we laid out vision, laid out our future, and we communicated that. We briefed VITAL to the whole Center many many times. We briefed it to the Agency many many times. People forget you have to communicate a lot. It was keeping the reach, keeping the carrot out in front of people, because this is what we're trying to get to. We can't get to that if we're holding on.

People are going to hold on. It's like that monkey bar analogy that people say, "I'm not going to let go of this bar till I can see the next one." That was the thing. You need to be able to give that next bar for people to reach to. That's what we were focused on.

JOHNSON: As Center Director through these changes, of course there's a community around Langley, but also the state of Virginia and you usually have to deal with politicians on different decisions. Just talk about that relationship and what you had to do as Center Director to keep people informed in the political world and to keep them on your side in the things you wanted to do.

ROE: That was a critical part of it too. You're right. I'd forgotten to even mention that was a big part of it. We told the story to our delegation.

For VITAL, which was the revitalization plan, if you were bringing down a tunnel, typically you might get the "Not on my watch" reaction. What we did is the same thing with our

federal representatives, our Virginia rep. I went up and briefed them, our senators, our representatives, on here's the plan. Here's where we're moving to.

And then they could see what's in it for Virginia, why is this a good thing. I'm not losing here, I'm gaining. Then they started to tell our NASA Langley story. Once we had informed them and they could see that the goal is not to close Langley. Because people outside the gates would go, "Wow, you're going to close Langley." Local folks didn't know the plan, so we'd have to brief them on the plan. We'd brief our federal guys on the plan. We'd brief our state guys on the plan. We did all of that so everybody knew what we were reaching to, because again then nobody would put in a roadblock to it.

We did a lot of that. Then I can remember especially when I'd first become Center Director there was a real push at the federal level. We need to put money in aeronautics. They would try to do that, and they wouldn't get how that could hurt us if you weren't thinking about the balance of the whole and how space was important to NASA Langley as well.

I put a lot of effort into communicating what we did as part of the space program and why it was so important and how by doing this a lot of times—that was back during the days of earmarks. Some of that has gone away now, but they put these earmarks in. What would happen is our aero program—there would be this earmark for some entity and that money would just go straight out of house. In the meantime what Mike Griffin would do is he'd go cut our in-house work, so then we would end up having to lay off people because of some earmark in there.

We needed to communicate what was happening because of that. By doing that, they started to realize that wasn't helping us; that was actually hurting us. That helped a lot too.

Some of the other things that we did, our visibility in the state increased dramatically over my tenure there as well because we first started our visits to the state level. We would have

our Aerospace Days at the capitol of Virginia. I can remember when we first started doing that they would say, "What? We have NASA in Virginia?" They didn't even know.

We really changed visibility in Richmond of what is happening in NASA in Virginia. We would display the different research that we had going on at this reception, even from our simulator work and the different things we were doing. People would come, and we were the most attended reception of any. That was also during the Shuttle era where we would invite different Virginia representatives down to the Shuttle launches. We really built support and advocates that way.

Those advocates were in education and were willing to then fund things from the state standpoint from an educational standpoint, like aerospace programs in Virginia that we implemented, and would fund students to come and were growing the pipeline of aerospace in Virginia. Just a lot of good came out of that, but it wasn't a focus in the past, and it changed over the time I was there. I watched it change dramatically.

JOHNSON: That's interesting that people didn't know NASA was in Virginia.

ROE: They didn't even know. Yes. That's changed.

JOHNSON: Especially since Langley was the mother center.

ROE: I know! Shocking! But we were able to change that.

JOHNSON: It was the beginning. I think you were there for the 90th anniversary for Langley.

ROE: Was there for the 90th of Langley and then the 95th I can remember distinctly. Neil Armstrong had come to the Center. I don't know if he was on the ASAP, the Aerospace Safety Advisory Panel, or if he was on the NAC [NASA Advisory Council]. It may have been the NAC. He was at an advisory group, and he had come down to Langley, and we were in a group with the NAC. I was sitting there right by him, and he stood up just impromptu on his own right in that session, and he said, "There are a lot of people that would lay claim to greatness that have come out in the field of aeronautics. But this place. This place is where…" He just gave this impromptu passionate speech about all the things that had come out of NASA Langley. It was so incredible. It was just before our 95th.

I knew he couldn't come to the event, but I wanted to say his words, and I asked him, and he sent me those words and I read them at our 95th. It was just incredible. That was a really cool moment just from getting to see that.

JOHNSON: Yes, be great if that had been taped or on film.

ROE: I know. I wish we had it on film.

JOHNSON: Being the first woman Center Director and then being there for those anniversaries, you talked about that before and how that wasn't your main focus. You didn't really think about it until I believe it was the person that was cleaning your office came and gave you a hug.

ROE: Yes.

JOHNSON: Katherine Johnson, you mentioned her the last time and how now the building is named after her. But there were a lot of changes. STEM [Science, Technology, Engineering, and Math] education was starting to become more important during the time you were there. Talk about what you did as a Center Director—you mentioned the educational aspect—to encourage women—other than being a role model, which you were—but any other things that you did while you were there to encourage women or students.

ROE: There's lots of things. While I was there we started the Virginia Aerospace Science and Technology Scholars. We modeled that after the Texas Aerospace Science and Technology Scholars.

It turned out to be huge. We started with I think 50 students, and then it grew. I don't even know how large it had become by the time I left. That was something that really resonated with the state. Various state representatives, Delegate Joe [T.] May really loved it. It tried to get all the areas in Virginia, get representation of all students from that.

There was an online curriculum and the students learn to do a mission to Mars, and then the best of that group would get to come to a weeklong session at NASA Langley. I watched so many students blossom that way. They were able to do hands-on work. They presented to this panel of industry. It was industry engagement. It was mentoring from researchers and various people at Langley. I think that was good for all, it wasn't just girls, but what I would see, it would make a big difference in all students, but especially girls to get to be a part of something and see they could do it and interact.

Girls really like to be part of a team. I think that I see that sometimes, and that's what we've needed to do differently in our schools. Everything is individual; we typically grade people individual-based and the real world is team-based. NASA, one person doesn't take care of mission to Mars. It takes a team. You have to be able to work together and collaborate as a team. You have to be able to understand different roles on a team.

I think some of that was really important to drive into the schools. Goodness, we had all kinds of work that we did at NASA Langley with students and girl students. I talked to Girl Scouts. That was just a big part of what we did. I mentored I don't know how many women. I did a lot of leadership talks at Centers, like women at Marshall Space Flight Center I know asked me to come out and talk. I had several women come up to me afterwards. Some of it was realizing multiple things. Number one, when you take on a new job, you're going to feel fear, it's just natural. If you're not, you're not challenging yourself. I would talk about that, and then I'd have women come and say, "Wow, you felt that?" Because they would take that feeling as, "Oh, I shouldn't go do this", when really that was just a normal feeling.

I think there was just lots of things that we did with women, and I still do in my new job, just to work with women and to overcome some of the biases that happen with the way some women respond to things, that people would take as, "Oh, she doesn't want to do it", when really there's just different responses between women and men. I think there's education that comes with that, and helping women understand their own responses and helping them to know maybe no, you should challenge yourself. No, you can raise a family and still climb the ladder. It works, look at me, I had three kids and I've raised them while I've been in NASA.

Just all of that has been part of what I've done since I've been part of climbing the ladder at NASA I would say.

JOHNSON: It's interesting because as you said girls like to work in teams. I think it's more natural sometimes for females or women or young girls to work in those teams. That's what you said you were most proud of at Langley is building that teamwork. I wonder how much of that is you brought in this change because you were the first woman Center Director, so I think that's interesting that that's what you brought to Langley.

ROE: That's what we brought and that's how we behaved. It changed everything in doing that.

JOHNSON: You said you were most proud of that. Is there anything during your tenure at Langley that was a hard time or a bad time or anything that comes to mind that was the most difficult thing you had to deal with while you were there?

ROE: The most difficult time was first coming into Langley and facing the 1,000-person reduction in force and all of those things that we were doing as part of that, and getting through that and overcoming that. I think those were the hardest times.

I can say towards the end it was great. I loved that team. They were great. When you build a team and you build people that are willing to look across and walk in others' shoes and think about things that way, you can overcome any problem together. Otherwise you won't be able to survive. I think that was what has made Langley successful over the years, having a different mindset, and being aware of their own leadership behaviors and how you can contribute to the problem in the way you behave as a leader.

You create an environment as a leader. If you're not conscious of that, that environment might not be a great one and people might leave. I think that's all part of the work that we did over the years.

JOHNSON: Is there anything else about Langley that we haven't touched on that you'd like to mention.

ROE: No, I think we probably hit it all. I think that's my memory of it.

JOHNSON: You moved on. You had an opportunity as you mentioned. You were doing Langley Center Director but you also had moved to Headquarters as Deputy Associate Administrator. Do you want to talk about that move and how that came about and why you chose to do that?

ROE: Yes. That came about because of the recognition that we had at Langley and wearing the Agency hat and taking the lead in things that we needed to be doing across the whole Agency. Charlie Bolden saw that. Robert Lightfoot saw that and wanted me to come up and lead.

We were just starting this Technical Capabilities Assessment Team;
it's called TCAT. The genesis of that came out of this kind of thinking. We needed to look at our capabilities as a whole. There was discussions on the Hill about—you had seen BRACs [Base Realignment and Closure] in the military and so they were talking about should we have a BRAC in NASA, should we do some of these things because NASA has all this infrastructure. A lot of deferred maintenance, our Centers weren't working together, a lot of duplication across Centers.

If you looked at this as a whole, again if you thought about NASA as a team, you can save money and be more efficient and actually do more things.

We had some really big missions. Again it's about vision and it's about if we want to be able to get with humans to Mars, we're going to have to change the way we operate. We need every cent we can get and invest and solve some of those research challenges that we have. We can't do that if we hold on to infrastructure that we no longer need or that's duplicative of something else. If we're not talking to each other about hey, I'm working on this piece and if you're working on this piece then together we can solve the whole problem, versus we'll just work on the same piece and then nobody's working on that other piece. It was trying to get us lined up to some of that.

The Administrator asked me to come up and so I did. I did at first on a detail basis and then Jurz was Acting Langley Center Director. Did that for about a year and then I decided no, I'll come do this, so I permanently took on this job and the deputy chief operating officer. It was about moving the whole capabilities model forward as an Agency.

By doing this work, our legislators became satisfied that we were doing what we needed to do as an Agency and the BRAC talks stopped at that time. We were doing the right things. We established technical capability leaders in areas that were looking across the whole Agency, and we'd ask them to come in and recommend divestments or investments that we needed. We put this whole structure in place.

Robert and I put a structure in place to build a team with our Center Directors. We formed the NBA (Non-budget Actions) team. But basically it was because he said, "We always get together to just talk about budgets and then we never build a team with the Center Directors like we did at our own Centers," because he had come from Marshall and Langley. "We want to

get together and do things that need to be done regardless of budget. These are just smart things to do."

We pulled all the Center Directors together and had these discussions around proactively where we needed to be investing, where we needed to let go of things, establish this TCAT model, think about our acquisition strategy from a standpoint of "Okay, if we think about what we've got to build and now think about who ought to build each piece and stop fighting."

Any new program area would be like five-year-old soccer. Everybody's running for the ball, and everybody's duplicating rather than thinking about if you focus on this piece, and you focus on this piece, then you've got something as a whole. That's the way we started to line things out and work on our effort as a whole. I was doing a lot of that.

Of course truly everything Robert did I was included in. We were really complementary in the leadership that we did. But at the same time we were advancing this technical capabilities model and trying to get that in place.

We did get it in place. The mission directors were somewhat on board. It takes a constant push, constant communication. You still get asked "Now why are we doing this again, why are we doing this again? I'm worried about my problems right now and not the long term health of the Agency. "

JOHNSON: During your time at Langley, which I didn't mention before, but dealing with these different Centers and different Center Directors and everybody going after that soccer ball, Constellation [Program], when that was canceled. I know every NASA Administrator has to take their orders from the presidential administration, and I know Charlie Bolden took a lot of

flak from Congress and everybody else because of that whole cancellation. Talk about that for a little bit.

You've worked under different Administrators and you've seen the different things in the funding and the struggles that they've had and then that filters down to the Centers. When Shuttle was ended and then Constellation was canceled, working with different Centers and trying to keep them motivated and not everybody looking for that one piece of pie because they're afraid the next thing is going to be canceled and then they're going to be out again. Maybe just talk about that challenge for a minute.

ROE: Yes. Part of that was the work that we were doing post Constellation cancellation and looking at where are we going and now what is each Center's role in that. If you had looked at our policies around what each Center does, it was all over the place too, so we hadn't done that. That was an effort too, for each Center. We had Ellen Ochoa with a small team stand up and do that and look across our Centers and what are going to be the Centers' roles.

There was a lot of work around all that, but that is trying to cement that this is the area the Agency needs you to work in. Then when a mission director has funding and needs advancements in that area—we had to get both to agree, because your model falls apart if we say we agreed on this and then you have a mission director go and fund it someplace else. Then your whole model falls apart. That was a big effort that we did to try to lay that out.

We worked with the mission directorates too. Which things do you need going forward? Which things don't you need? Mission directors on the other side, they were saying, "Hey, we're getting forced to fund these things that we don't need." We were trying to line up the whole Agency, because we hadn't been doing that.

I think we put in place a model and an approach where Centers were working in the right swim lanes that you wanted them working in and not just trying to go after anything new, whether they had the capability or not, and get mission directorates aligning their funding that way. Now they cemented that in this forum. The NBA used to be more of an ad hoc forum that Robert and I did. Charlie wasn't there for that. This is the long term goal of NASA so we led it as the top civil servants.

I think that's helping with acquisition strategies now and how they're defining now the work.

JOHNSON: You did work under a lot of different NASA Administrators and Acting Administrators. Talk about some of those Administrators that you worked with and the differences as far as working with Sean O'Keefe or Mike Griffin as compared to Charlie Bolden. You worked closely with Robert Lightfoot and he was the Acting Administrator for a while.

ROE: You mean their different styles?

JOHNSON: Yes, just their different styles of being the Administrator.

ROE: Now Sean I wasn't as close to. I can't talk firsthand about how Sean did a lot of things. I can tell you about just communications. Sean's communication style was not very direct, and would be long, a lot of things said, and then you weren't really quite sure what the answer was in the end. Mike, you had no doubt what the answer was. You had no doubt what Mike was

saying. He was very succinct and to the point, almost brutally to the point. Mike was also laser focused on what we needed to do in human spaceflight.

Charlie was a people person. Charlie was a feeler. Charlie cared very very much about people. You ride with Charlie in the elevator, he's going to be talking to everybody on the elevator. He knows people. He'd go down the hall and talk to people. He was very in touch with people. So, they were very very different. Mike was definitely not that. Not that. They were just very very different styles in the way they ran things. I'm not saying they're bad or good, I just think they're very different.

There was a lot of things that were really good that Mike did in the directness. We probably needed more direct stuff post Sean. He did some rebalancing of work and looking at what work ought to be done where. He did some of that during his tenure and closed some things during his tenure. He just did it a lot more abruptly maybe than we were doing under Bolden. Sometimes maybe you need that abruptness. I don't know. I don't want to say what's right or wrong. I'm just saying it was very very different approaches and you wouldn't always know the story behind sometimes what Mike did, where Charlie was more communicative, I would say. I enjoyed working with both but worked closer with Charlie since I moved to Headquarters.

I loved working with Charlie. I was in the A-suite when Charlie was there. I was not in the A-suite, I was a Center Director, and Mike would pull the Center Directors together just about every month and the mission directorates. It was a huge forum. There wasn't a lot of dialogue. You were presented to and there wasn't as much dialog. Mike didn't do team building. Robert and I were able to build a team under Charlie. I liked that building a team, and it was much stronger with that. Mike didn't necessarily do that, and I can tell you for Mike there

was no question on Mike's priority, and that priority was human spaceflight. Sometimes that would be rough for somebody that was at a research center, even though we played a role in spaceflight, but we had aeronautics, and I think he didn't think those things were NASA's priority or his priority as Administrator.

That's hard to say, because Mike would tell you he values aeronautics, but he knew what his priority was. He was singularly focused on human spaceflight—I don't want it to ever come out like I'm disparaging Mike. I owe Mike a debt of gratitude. He's been really good to me. It just was different styles, very very different styles.

JOHNSON: Yes. They all have different backgrounds too.

ROE: I think some things he did were very much needed. They just were very different in their styles. I was much closer to Charlie and his style just because I was up at the Agency level. I was in different positions at that time too.

JOHNSON: It's like anything else, different personalities, different backgrounds bring different things to a job and lead differently.

Before we go in the last couple minutes I just wanted to talk about when you left. After the last election I think you were the Acting Deputy Administrator under Robert Lightfoot. You continued that for a little while, but then you left and took on this challenge, which again you were the first female chancellor over UNT System. You keep following this thing.

ROE: Staying the course.

JOHNSON: What led to your decision just to make this change?

ROE: I love NASA. I had 33 years, loved the work I did there, so I really wasn't looking. A search firm reached out to me and at first I told them, "No thanks." Then the head of the search firm called me and so we talked. We talked a long time, and I started to realize I felt a lot of passion around it.

I started to see how I might do this job that I'm in. I said, "You know what, I think I'm going to go for it." I did, and it lined up just perfectly, because typically for a chancellor or president or anything like that in a university, in the past they've always been looking for an academic. I'm not an academic, but I've operated a large agency. I've run a large agency. Our board chair was looking for just that. He wanted an operator. He stated that in the press. "I'm looking for somebody that can run a large operation." He was looking for somebody different. He wasn't looking for an academic, and he wanted somebody to be able to lead us forward. It just lined up right where somebody was looking for something different and I brought something different to the table.

They were looking for the kind of things I had done in NASA too where I was looking across the Centers and looking for streamlined services, and building a team. All of those things they were looking for, and I had proven that I could do that in NASA. I think the planets aligned and so therefore I'm here.

But I was thrilled with the work I did with NASA. I think I had moved to the top. What's important to me is if I'm going to be somewhere I'm making a difference. I don't think that ever came to an end. I always said, "I want to be able to evaluate myself. If I'm no longer

making a difference it's time to leave." I don't think that's really why I left. I think I was still making a difference. But I had moved to the top without being a political, and at that point I wasn't looking to be a political appointee, so it really worked out. Although I had people talk to me about my name in the hat for a political job, but I didn't really want to do that.

JOHNSON: I think it's interesting, looking at the beginning of your career in those early teams in Kennedy [Space Center, Florida] that you were working with and relationships you were building and then when Mike Griffin pulled you in, that was one of the things, that he didn't know you but he knew people that knew you, and building all those teams all the way through. That seems to be the theme I guess if you had to look at your career and think of a theme. That's pretty interesting.

ROE: Yes, I think it's been pretty similar wherever I go. If you work well with people around you, use their talents, and respect them, it will always be a positive thing.

Since you mentioned Mike, I thought of another difference between his leadership and Charlies. Mike was very much on controlled messages, singular messages, to the Hill, very focused. Charlie, anybody, you want to go to the Hill, go ahead. It was just very different styles even in that regard.

I remember Robert and I were like, "Well, wait a minute, wow, what a shift." With Mike it was "don't go to the Hill without someone with you and these are your talking points, and don't sway from those." So it was a singular message but very controlled.

With Charlie, Robert and I, with the Center Directors and Mission Directors, built a story about NASA's place in the world. Preparing for that transition, knowing when Charlie was

leaving, and we did that working with that team. It was one of the best things we did. It helped us tremendously in the transition.

All the Center Directors felt ownership of that, NASA's place in the world. Then no matter what administration came in, our story made sense with whatever administration we got. That paid dividends, I can tell you, in the transition with the new administration. It was really really successful. It was a focused message and the Center Directors and Mission Directors were all on board, but it was developed in a very different and collaborative way.

I think Robert and I were a great team up there, so I really enjoyed working with him. He's a terrific leader.

JOHNSON: Yes. We have one more interview with him to do.

ROE: Good. He's a great guy, a great leader.

JOHNSON: Is there anything we haven't talked about that you wanted to mention? I know you need to get out of here, so I don't want to keep you.

ROE: I don't think so. Did you hit everything that you were wanting?

JOHNSON: I think so. Is there anything that you can think of that you wanted to ask, Jennifer?

ROSS-NAZZAL: I thought of a question but I know you've got to go.

ROE: Ask it. We can squeeze in one, if I won't be so long-winded.

ROSS-NAZZAL: It's probably a very simple answer. But you had mentioned stovepiping at Langley and that you would be willing to give up something at your Center if it meant that this would be for the good of the Agency. I was wondering. Was there something that your Center had to give up?

ROE: We gave up a lot of things. Our Center shrunk by 40 percent over my tenure there. Yes. We let go of a lot of things, we closed things, we demolished things. The whole face of the Center changed. We got smaller, but we got stronger in that process because we were being very strategic about what infrastructure we built and that it was better than what we had.

We did a lot of that. Then you started to see that catch on at other Centers as that was rewarded. You could see how that would not have worked if it hadn't been rewarded, if we had shrunk and then they'd just taken the savings. You drive behavior with what you reward. But Charlie didn't do that. Charlie, he gave back to the Center to invest in more in a number of ways.

Other Centers started looking at their plans and getting more strategic than they were. Then when Robert and I were there and we were trying to build a team and to think that way as a team.

ROSS-NAZZAL: That's what I was wondering. Is it something you didn't want to give up?

ROE: You'd still have to force it, but you did it in a transparent way. I would say, "Okay, let's get all the data on the table, let's understand, have the Chief Engineer weigh in, have others weigh in." If you can think differently. Yes, I've always done this measurement this way in this facility. Okay. But the real goal is the measurement, not the facility, so can you get that measurement a different way? It's trying to get people to think out of the box and not always do things the same way you've done and hold on to what you've got, because there may be a whole different thought process. That's what we tried to drive. Does that help?

JOHNSON: You did some of that at JSC too when you were in that research group. There's a lot of that going on.

ROE: Yes. Oh yes. You heard me. Because we cut a lot of our procedures out. We were having researchers, "Okay, submit here, okay, now submit here, now submit here." We were driving them nuts. They were just little small PIs [Principal Investigators], so they didn't have a lot of people to build all these things. We really didn't need it till here, so why were we asking for it all that time? That's the kind of thing. You just ask for things without really saying, "Okay, what do I really need?" Questioning yourself on what is it you really need. That's the kind of thinking that we were trying to drive.

JOHNSON: I appreciate it.

ROE: Thank you very much.

JOHNSON: Thank you so much.

[End of interview]