NASA STS RECORDATION ORAL HISTORY PROJECT
EDITED ORAL HISTORY TRANSCRIPT

STEPHANIE S. STILSON
INTERVIEWED BY JENNIFER ROSS-NAZZAL
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ROSS-NAZZAL: Today is April 13, 2012. This interview with Stephanie Stilson is being conducted for the NASA STS Recordation Oral History Project at Kennedy Space Center. The interviewer is Jennifer Ross-Nazzal, assisted by Rebecca Wright.

Thanks again for taking time. I know it's a busy, busy week.

STILSON: You're welcome. Yes, exciting.

ROSS-NAZZAL: With the ferry coming up and everything.

STILSON: Yes, very busy.

ROSS-NAZZAL: Yes, your first offload.

STILSON: Yes. So we have gone through the process of setting up the wind restraint system, and, gosh, what an immense undertaking. I didn't even realize the complexity of it until I got there. For the largest crane that we have, which is a 650-ton crane, 60 flatbed trucks' worth of equipment just to set up the crane itself. Of course, we don't build the crane. The crane vendor that we hired does that. Just to see all that equipment out there on this big apron out in the middle of [Washington] Dulles [International Airport, Virginia] was a pretty neat thing to see.

We, right now, are at the point where we have set up the wind restraint system, which includes the masts and the taglines and the winches that are going to allow us to ensure we have no unwanted movement of the Orbiter when we're doing the offload of *Discovery* and the onload of *Enterprise*. So that's all out there. We actually call it the concrete island because that's what it feels like, because where we have to go to get out to our work location is all controlled airfield space. We meet in a parking lot, we all pile into vans together, and then we go through security and have to wind our way through the taxiways and runways. It takes about 15 minutes to get from the gate out to what we call the island, which is Apron W at Dulles International Airfield.

We brought in trailers, port-a-johns, power generators, so it's like being on an island. You have to stage everything that you need right there. So everybody brings their lunch. We don't leave the island for lunch. We stay there, but we've gotten to the point now over the past four weeks, of having everything ready to go except for finishing up with the cranes. There are two big cranes. The aft crane is the larger of the two cranes. That's the one they're still building up right now. Once that's complete, then we can start assembling the sling, which is our responsibility, and so that hopefully starts tomorrow. Most likely, we will work Sunday, which we were not planning to do, so that we can be ready by Monday to actually do a confidence run.

We'll use the whole wind restraint system, the sling, the cranes, and actually practice lifting the sling up, setting the sling down and so forth, just to prove that we're ready to go on Wednesday—*Discovery* will arrive on Tuesday and then Wednesday will be the offload activities. So it's moving quickly. It's been a year and a half that I've been involved with this, and it seemed so far off, and now it's just coming at such a fast pace it's really incredible.

ROSS-NAZZAL: Yes, it's amazing. So you have a lot of USA [United Space Alliance] people up there?

STILSON: Yes, our team is approximately 45 people, the majority United Space Alliance workers. I do have a handful of NASA support. I have a couple engineers, quality, and safety. So, as usual, how we always operate, you have a big conglomerate of the contractor and then a small group of the NASA folks.

ROSS-NAZZAL: You guys had actually tried out the system, I think, last year?

STILSON: Yes. We did a dry run here, yes, at the Shuttle Landing Facility [SLF]. We did the same thing. Basically, to set up the wind restraint system you have four masts, and each mast has a winch and taglines. All those things have to be anchored into the concrete, and so we actually did that out at the SLF to ensure that we could secure them. Now that the system is all set up at Dulles, we proof-load it to make sure that everything's going to hold. We also have to put a tie-down point for the Shuttle Carrier Aircraft [SCA] and that's drilled into the concrete as well so that when we roll in the Shuttle Carrier Aircraft, we can hook up to the nose landing gear. The tie down points ensures that the SCA doesn't move it all while we're doing this operation.

ROSS-NAZZAL: We were just talking with one of the SCA guys who mentioned that you've got to tie that nose down. Otherwise you start to lift that plane up, which I thought was interesting. I hadn't thought of it that way.

STILSON: Yes.

ROSS-NAZZAL: So you'll be landing then on Tuesday? You're going to be in the Pathfinder?

STILSON: Yes. I'm fortunate enough that I get to travel in the Pathfinder. We'll be landing 30 minutes ahead of the SCA , maybe a little more than that, because I don't think the Pathfinder's going to do the flyovers, so we'll be in the Apron W area when the SCA lands at Dulles. Actually, we start work right away. If we plan to land around 10:30 or so my team will be there waiting for *Discovery* to arrive.

The first day's activities are not within the wind restraint system. The SCA will be parked outside of the wind restraint system, and we will use aerial manlifts to get up to the attach points where the sling attaches to the Orbiter. We have to install what they call cups and liners, so basically get those attach points prepared for attaching the sling.

The other thing we'll do that day is we'll go ahead and loosen the bolts that hold the Orbiter onto the 747, so we won't completely disconnect it but we'll loosen those up because they're at a very high torque. So we'll loosen those up, and by that time the day's over. That will take us six to eight hours.

Then we'll look to start bright and early, five a.m., the next day, the 18th, and that's the real day. That's offload day, so that's at least 12 hours, if everything goes well, where we actually go through the process of bringing the SCA within the wind restraint system; lowering the sling; attaching the sling to the Orbiter; disconnecting the Orbiter from the SCA; lifting the Orbiter off the SCA; backing the SCA out; lowering the Orbiter down so that we can reach up

and connect up to our hydraulic connections points; lower the landing gear and then lower the vehicle down to weight on wheels. At the conclusion of the 18th, we should be done with those tasks, and that would be a very good day to have that all behind us.

ROSS-NAZZAL: Then are you passing at that point off to the [Smithsonian National] Air and Space Museum [Steven F. Udvar-Hazy Center, Chantilly, Virginia], or are you taking it in?

STILSON: No. We actually will be responsible for towing *Discovery* over to the Udvar-Hazy Center space hangar, so we will do that the morning of the 19th, which I believe is Thursday. Yes, Thursday morning. There's actually a gate that separates Dulles from Udvar-Hazy Center, because it's right next to Dulles. So we will tow over to that gate, and we will wait at that gate for the ceremony to start.

So there's a ceremony, a huge ceremony that's going on, and the first thing that happens in the ceremony is we tow *Discovery* up close to the stage. *Enterprise* is already going to be there. We will have sent people in early in the morning to bring *Enterprise* out of the hangar. *Enterprise* right now is sitting in the hangar exactly where *Discovery* is going to sit when we swap the vehicles. So we will have moved *Enterprise* out. It'll be standing by ready to go, and we will bring *Discovery* up to the stage where the ceremony will occur.

They're doing a nose-to-nose shot with *Discovery* and *Enterprise*. Although they will be staggered—because you have the tow bar and the tow vehicle, the tug—but if you are looking straight on, it will look as if *Discovery* and *Enterprise* are touching noses. So it's kind of the ceremonial handing over the baton between the two vehicles. There's a great ceremony that Smithsonian has set up.

Then once the ceremony is over, we will move *Enterprise* back out of the way, bring *Discovery* into the space hangar, get it located in the space hangar, and then we'll be prepared to take *Enterprise* out to Apron W. At that point we start the onload process with *Enterprise*. So although we're going to get to enjoy the celebration, we must immediately get back to work. There's not much rest for us before we're done with this process.

ROSS-NAZZAL: Then you're taking *Enterprise* up how many days later?

STILSON: Yes. So then we plan to ferry *Enterprise* on the 23rd. So on the 20th is when we will do the onload operation, which is very similar to the offload, just in reverse. So that's a full day, 12-hour day, and then we'll look to have the 21st, that's a Saturday, to be the post-ops [operations] day to wrap things up.

Sunday will be a stand-down crew rest day, and then on Monday the 23rd we'll look to ferry up to JFK [John F. Kennedy International Airport, New York]. We don't actually immediately start the offload of *Enterprise* when we get up there because we have all that equipment still down at Dulles. The wind restraint system has to be broken down, packed up, and shipped up to JFK. We have to set all the equipment up again. It took us almost a month to do that at Dulles, so it will take us approximately the same amount of time to do it at JFK before we're ready to offload.

So although the SCA with *Enterprise* will be at JFK, it will be parked inside a de-icing tent that the airfield uses when they need to de-ice their planes. It will be out of the weather somewhat but not totally. It's still open, so it's not environmentally controlled by any means. With *Enterprise* on top of the 747, the vertical stabilizer of the orbiter is so high you can't even

get it all the way underneath the cover. So the vertical stabilizer s of the Orbiter and the 747 will be sticking out of the back of the tent, but it's the best that we can do in that configuration, and we've done that before in the past during nominal ferry flights where we've had to stay somewhere overnight. They've pulled it into a hangar and had the tail sticking out.

So *Enterprise* on top of the SCA will sit there and wait for us to get everything pulled together, ready to go, and then we'll do the offload. The offload of *Enterprise* will be a little bit different than the offload of *Discovery* based on the fact that Smithsonian wants *Discovery* to be weight on wheels, in other words on its landing gear, just as it is at landing. So that's the process that we will take to put *Discovery* into the configuration that the Smithsonian wants. *Enterprise* is actually going to be, at least initially, in order to get it to the Intrepid Sea, Air and Space Museum [New York, New York], in a configuration to barge down the Hudson [River].

So to prepare for barging, Intrepid wants us to offload *Enterprise* onto a transporter that they are building that actually uses spare SCA attach points. So, basically, we will lift the *Enterprise* up off of the SCA, back the SCA out, bring in their transporter and then lower *Enterprise* down onto those attach points, just as if we were lowering it onto the SCA. So the process is the same, but then once we get it on their transporter, at that point in time NASA's involvement is done. We will have secured it on the transporter, turned it over to Intrepid, and they are then responsible for moving their transporter. Intrepid is going to store it there for a while because they cannot barge until they get the lowest tide, and low tide is in the early June timeframe. So they'll sit there for a couple of weeks and then they put *Enterprise* on the barge and move it up the Hudson. We will be bystanders at that point in time, which will be a little odd, a major operation with Orbiters and we're not involved. So that is a little bit hard for some of us to swallow, but that's the way it is.

ROSS-NAZZAL: Last time we talked a little bit about processing the Orbiters, getting them ready. *Discovery*, she's ready to go.

STILSON: Ready to go, buttoned up.

ROSS-NAZZAL: In the VAB [Vehicle Assembly Building]. You told me a little bit about how you had planned to process her, but I read that there were some changes along the way. Can you talk about that?

STILSON: The actual safing process did not change, going through and removing all those hazardous commodities off of the vehicle stayed the same. What did change is we had the Space Launch Systems [SLS] program that has come about within NASA that needs and wants to use a lot of the main propulsion system hardware out of the Orbiters. They wanted it out of all three of the Orbiters, and they did get hardware out of *Discovery*. The difference is because *Discovery* is the vehicle of record, Smithsonian obviously wanted to keep it as flight-like as they could, and so they negotiated with NASA to not take as many components out of *Discovery* as we're going to take out of *Endeavour* and *Atlantis*. So although some things came out, the vast majority of the aft compartment of *Discovery* is intact.

With *Endeavour* and *Atlantis* that will not be the case. We're taking out the large 17-inch feed lines, and many other smaller components. Pretty much the entire main propulsion system is going to come out. So when we're done with that, and we're working on that right now, you'll basically look into the aft compartment and it'll be empty, which will be an odd sight. I think it

will be very similar to what we talked last time regarding the orbital maneuvering system [OMS] pods and the forward reaction control system. How we are gutting those modules and how on the outside they looked perfect, as if they had just landed, but on the inside everything is gone. It'll be basically the same for the aft of *Endeavour* and *Atlantis*.

So we're in the process of doing that on both vehicles right now, and we're still doing some safing activities, and then eventually we will get into some display activities as well. Display activities are configuring the vehicle in the way that the particular museum wants it configured. There are certain things that they have asked us to do to configure the orbiter. That's pretty much a small subset of the work compared to the safing and removing the SLS hardware.

ROSS-NAZZAL: I think last time you told me that some of the museums might want the galleys, they might want the potties. Have some of them requested those remain outside the vehicle?

STILSON: Yes. In fact, both California Science Center [Los Angeles] and the Visitors Center here at Kennedy have requested that, and, in fact, we have already shipped the galley and the potty to California Science Center. They actually already have the components, because they come out relatively early in the processing flow, but then they have to go back to Houston [Texas, NASA Johnson Space Center] to be decommissioned or reserviced, and then we shipped them back here to KSC and then to California. So that's been done.

Something that happened just recently with *Endeavour* is after *Endeavour* landed, we always have to go remove the flight tires, and we had removed those and did the testing that we had to do to make sure that everything was okay. Then we reinstalled the STS-134 tires back

onto *Endeavour*. In the course of our discussions with the California Science Center, because they're planning to display with their landing gear closed, they asked if they could have those actual flight tires to display separately. No problem. We have plenty of what we call roll-around tires, or RATs, which are previously flown tires, so we just recently swapped tires. To you and I looking at them, you can't tell a 134 tire versus another tire, but they want to be able to show people these are the actual tires used on Endeavour's final landing.

So we're happy to do things like that. We try to keep that type of work within scope, because obviously it takes additional cost and time to do that. Now, the museum, in the case of the California Science Center, is paying for that, so they can choose to say, "Hey, even though you're telling us it's additional money, we'd like you to do it." But we try to minimize that. If there are a lot of things they want to do after they get the vehicle, they're more than welcome to do that, but some of those things they can't do. Obviously, they can't go pull off the landing gear tires, so we're more than happy to help them out with that.

ROSS-NAZZAL: Tell me about powering down the vehicle. It seemed to be a big deal here at KSC. What happens when you power down the vehicle, and what do you have to do after that?

STILSON: It's funny, because we—I shouldn't say we celebrate, because it's not celebrate, but we focus on the final power-down, but in reality, it's the final power-up, because it's the last time you power the vehicle up that day. There are certain things in the course of our processing that require the vehicle to be powered, and so we had to get through all those activities. Then there's another set of activities that after completed prevent the vehicle from being powered up. For instance, we're having to go through and drain all the Freon out of the Freon cooling system.

There are two loops for redundancy. Once you do that with both loops, you can no longer power up the vehicle, because it generates so much heat you would immediately start affecting the avionics boxes adversely.

So we de-serviced the first Freon loop relatively early in the processing flow because we could operate on the second one. Then you get to the point where you're done with all your power activities, then you power down that final time, and now you can go de-service the final loop. So that's basically what the celebration is about. In the course of the processing flow, a great amount of work was done to get to the point where we can power down for the final time. For us it was more of, "We're powering this vehicle down for the final time." That's not something any of us really ever thought about doing, and it is a very unique situation to see the glass cockpit, the MEDS, the multifunction electronic display system, powered up and to see those displays. Once you realize that's never going to be possible again, then it is kind of a hard thing to swallow. We did focus a lot on that being a major milestone for our processing.

The way we get around that is that we have some high-[resolution] digital images that are basically taped on those displays. I saw a picture of *Discovery* that had that, and you really can't tell that it's not the actual image. So it's good to do that, because so far we've had two media days where we actually allowed media representatives to go into *Discovery* and then into *Endeavour*, and we were not powered up. It's not smart, when you're going to have people coming in and out of the vehicle, to have it powered, because you could accidentally hit a switch that could cause problems. They were disappointed because they wanted to see it, but with these taped-up images that we put on there, it looked real. We did the best we could to accommodate and give them the best experience we could, but for safety purposes and for the safety of the vehicle, it didn't make sense to have it powered up at the time.

So, yes, we've had the final power-down, obviously, *Discovery*, and then also I think we've had the final power-down on *Endeavour* as well. I haven't been following. Because of everything that's going on with being prepared for the offload, I haven't had the opportunity to follow as closely along with the processing for *Endeavour* and *Atlantis*. Fortunately, I have people to help me that do that, so they definitely have their thumb on it and they know what's happening.

Ironically, it's probably a good thing that *Discovery* retired first, because *Discovery* is my baby. I really wanted to be a part of those activities going on with *Discovery*. I care a great deal about *Endeavour* and *Atlantis*, but not quite as much as *Discovery*. I've been fortunate that we went through some of those major milestones along the way with *Discovery*, and I was able to be a part of it. I was not there when they powered down *Discovery* the final time. I was actually on TDY [temporary duty]. I believe we were at a display site working with either California or New York so I did not get to say my final goodbye before she powered down for the last time, but Bart did. Bart Pannullo is my right-hand man, and he was actually the last one to come out of the ship before they closed the hatch, so he was there for that. I was glad for him to get to do that.

We've talked about this before. We've kind of likened it to having a child, right? And we've talked about the fact that it seems like you're sending your child off to college. You think about missing the dance recital or sometime things that come up in your work life and you have to miss a softball game or whatnot, that's really how I felt about it. "Well, I really just can't be there but Bart's there. He's taking care of her and everything will be fine, but I really wish I could have been there too." But I've gotten to see and do a lot of great things, so I've been very blessed so far.

ROSS-NAZZAL: We also talked last time about the fact that you were starting having to work things like contracts.

STILSON: Yes.

ROSS-NAZZAL: You're having to contract out and get people to work the de-servicing of the Orbiters and facilities as well.

STILSON: Yes.

ROSS-NAZZAL: So how many people did you end up getting on your team?

STILSON: We still have about a hundred people on the team total, which is what we expected, and that's total for working all three vehicles. So a much smaller team than when we were processing them for spaceflight, obviously. But in a way that's good because you need that consistency among the three vehicles for what we're doing because we're overlapping that work quite a bit.

In the ideal process, we would do everything serial. I would process *Discovery* first, learn all those lessons and then process the next one. But obviously from a time constraint, that would send your schedule way out, so we are doing a lot of things in parallel. In a way, having that smaller team helps, because they do share those experiences across the vehicles and can easily adapt from one to the other, depending on what they come across as they're doing that

work. So it's been good. I think we have the right number. There's always times where you wish you had another person to help out or the person you thought was going to help out took another job, and so now maybe it's not the best person but they're going to get up to speed and they're going to do a good job as well.

Just like any other project, any other program, we're going through that, maybe a little bit more than normal because of the layoffs and because of the fact that the Shuttle program is coming to an end very quickly. That's made it more difficult, I'll say it that way; it is not that we can't do it, but it does make it more difficult when you lose key people that you thought you were going to have. And you can't blame them. They take other jobs and have other opportunities, and they have to look out for themselves and their families. As a team lead, I would love to keep everybody that I consider my A-team. I'd love to always have my A-team. Everybody would. Sometimes you don't always get that opportunity.

Everybody has been stepping up and doing a good job, and it's a hard thing for United Space Alliance to manage. They're in a tough position themselves, so it's hard for us to be very critical of them because they've done such a wonderful job with the situation that they've been dealt.

ROSS-NAZZAL: Have there been other challenges along the way as you've been working on this, besides personnel issues?

STILSON: You know, the processing of the vehicles has gone really well, better than I expected. I thought that we might stumble upon more challenges along the way, and it's actually been the smoothest part. The biggest challenge has been the contract side and getting on contract to do

work. We were used to operating in the Space Shuttle program where we had one big contract and never really had to worry about whether what we were doing was in scope of that contract or not, where now the way we operate, the very first question I have to look at anytime someone comes up with a new requirement or something they want to do is does that fall within scope of a contract, and most of the times the answer is no. So that means if you really want to go do that, we have to go amend that contract or put a new contract in place and that takes time. That takes a lot of time.

Everything ends up having a ripple effect of what you have to do to get through contracts, to get through procurement and so forth, whereas, I'll call it the real world outside of the Space Shuttle program, people deal with that every day. I've never had to deal with that, and so it's been a great experience in the fact of learning, but it's also been very frustrating because we were so used to, "Okay, we need to go change out this black box?" "Then go change out that black box." There's no need to go talk contracts. We have a contract in place. We have scope to do the work.

That's been difficult in dealing with the contractor, not that they're making it difficult. Really I think most of the difficulty happens more on our side than on their side, but there's that negotiation. We give them a statement of work. They come back with a plan and a dollar figure associated with that. We review that, and we come back with a government estimate that's never the same. It's usually less. So then we get into the negotiations of what is that true number, what should it be? And we have an obligation to save the government money, so if we really feel like it should not cost as much as the contractor is suggesting it costs, it's our job to ensure it doesn't. We are stewards of the country's money, so we need to be diligent.

Like I said, I've learned a lot and I think it's been a great experience, but it's definitely been the more frustrating part of it. I'd love to just process Space Shuttles. I'd love to manage a schedule and get a vehicle ready to fly, and there are other not-so-much-fun things that go with it as well.

ROSS-NAZZAL: Has that had an impact on your schedule because of these ripple effects with the contract?

STILSON: In some cases, yes, we've had to delay things. We haven't had anything that has impacted a major milestone, like delivery of a vehicle, but our internal milestones along the way have been affected. But that's part of what we do. In the past, I would say we would have done that manipulating of a schedule and changing of plans based on a technical issue, where now we may do the same type of thing, but it's based on a contractual issue. So, okay, we wanted to start on April 1st. Well, guess what? We're not going to be on contract until May l[st]. What do we do to go work more efficiently, change the schedule, or cut back on the requirement? There are a lot of different options and things that we look at when faced with those challenges.

ROSS-NAZZAL: Did you meet the milestone goal for completing *Discovery* on time?

STILSON: Yes, we did. Actually, we were ready with *Discovery* earlier than we initially planned, and we went over to the Vehicle Assembly Building earlier than we had targeted. The main reason for doing that was to get out of the way so that *Endeavour* could get back into process. We had had *Endeavour* sitting over in the Vehicle Assembly Building waiting for her turn to get

back in the Orbiter Processing Facility [OPF]. So the sooner we were finished with *Discovery*, the sooner we could get back started on *Endeavour*. It wasn't because we were going to deliver *Discovery* any earlier. We had already set that date, and that wasn't something we wanted to change, but it really did help to keep moving on *Endeavour* because with her in the VAB we were not doing work on *Endeavour* that we needed to do in the OPF.

ROSS-NAZZAL: How long did it take you to finish her and get her ready to go?

STILSON: Oh, gosh, I'd have to pull the schedule. You mean my total time for *Discovery*?

ROSS-NAZZAL: Yes.

STILSON: Total time in processing, let's look at this. I don't have my glasses on. Look, see, I've already flipped the page and *Discovery*'s on the second page now because she's done.

ROSS-NAZZAL: She's done. She's ready to go.

STILSON: Yes. Let's see. We landed in March, right? Beginning of March? And we rolled over and we were ready to ferry at beginning of March, so a full year. In fact, right at a year from landing, I believe it was. That's right, the 9th. I remember someone saying that, "Do you realize today was the one-year anniversary of landing?" So right at a year.

When you are talking about a year-long schedule, a week or two difference is pretty good. We thought we were going to be about—a half a week later was our original target, so I'm

pretty proud of the team for making it that close to the original schedule. We talked about how we didn't change a lot of the requirements on *Discovery* like we are doing on *Atlantis* and *Endeavour*. So those schedules have changed quite a bit, significantly, but it's because we added new requirements, and that's always the case. If you add new requirements, mostly likely your schedule is going to have to slip, because it's that whole concept of putting 10 pounds of potatoes in a 5-pound bag. It just doesn't work. Something has to give.

So in some cases we can hold the schedule for major things, and other times we just can't do it and that's been the case with *Endeavour* and *Atlantis*. We haven't had to move major milestones, at least recently, for *Endeavour* and *Atlantis*, but when we added the removal of the main propulsion system hardware that did slip us out.

But that's something that we worked through the program, and everybody agrees, because now you're operating with two programs. You have the SLS program and the Space Shuttle program, so they have to agree that, okay, if we're going to go take this hardware out of the vehicle, who's going to pay for it and who's going to pay for the effect of the schedule, and so that took quite a bit of time. My role in that is to lay out the plan, lay out the schedule, show what the impact is, and then the business office side comes up with the cost associated with that and then we go to the program and pitch the plan. The two programs came to an agreement that it was a smart thing to do from an agency perspective to allow us to share this hardware with the SLS program.

ROSS-NAZZAL: Has your team of one hundred been working regular eight-to-five hours, or have they been working around the clock?

STILSON: For the most part, we work five days a week, eight-hour days. Now there are some instances, depending on the activity, where we may go longer days, 10 hours, 12 hours. We have worked some Saturdays and Sundays, but not many, just here and there, once again based on how an operation needed to work. For instance, when we were removing OMS pods before they were de-serviced, they were still hazardous. So we clear not only your processing bay, but that entire building during the removal of the pods. That's a task that you don't want to do on a weekday because then you've got a bunch of people displaced from their offices. So something like that we would plan for a Saturday so that we can minimize how many people we affect by the operation. There's been a handful of instances like that, but not too many.

Then, of course, now that we're working at Dulles, we work 6/10 [6 days a week/10 hours a day]. We started out with 6/8s. It depends on the work that we're doing, but once again we're able to go 6/10s if we need to and then, for offload it's at least 12 hours, and we may work Sundays. When we're offsite, we have a little more freedom to work longer hours and more days just because of the sheer cost of working remotely, paying all those folks TDY money and so forth.

We always have to be careful that we don't overwork anyone and that it's not taxing the team too much. So we're very, very cognizant of that. For instance, this past week, we got our work done pretty quickly and we were holding for the cranes, so we would work short days. We had some things to do because the workforce is there and they want to work, but they would go home after six hours or after eight hours, and it was a very light day. So we try to keep that in mind, that if we know a big operation's coming up that's going to require long hours, we try to, a couple of days before that, have very light workdays so that we can assure that they're properly rested and comfortable going into the hazardous operation.

ROSS-NAZZAL: What are you doing this weekend? *Discovery*, she's getting towed?

STILSON: Yes. Tomorrow morning, bright and early, 5:15, we should have first motion out of the Vehicle Assembly Building, out to the SLF, and we'll immediately go into what we call our mate operations. So we will tow *Discovery* into the mate-demate device. There's a sling just like the sling we're going to use at Dulles inside the mate-demate device that we lower down, connect to the Orbiter, and then we're able to raise the Orbiter up. They bring in the SCA, lower the Orbiter down, attach it, disconnect the sling, and then we back out the entire stack of SCA and Orbiter.

Tomorrow we'll roll out, and we'll immediately go into those operations. Saturday is the big day. Saturday, we plan to get soft-mated, and then hard-mated on Sunday. Then we're going to back out of the mate-demate device on Monday morning, not because we have to, but because we want to give the employees an opportunity to come out and take pictures and group photos. And, of course, media will be out there. Everything, as usual, is pending weather. So as long as weather's good, Monday morning we'll back out of the MDD.

There's some work that you have to do once you back the Orbiter out from the mate-demate device. You have to pull window covers and that's about it on the Orbiter side. Then there are some things we have to do on the mate-demate device side. There are some pieces of hardware that we want take with us as spares for the operation that is happening in Dulles, and we fly those pieces up on the Pathfinder. So we have to go in and remove those components. If things go well, Monday should be a very light day from a work perspective and will give

everybody the opportunity to have a really neat view of the Orbiter sitting on top of the 747 before we take off Tuesday morning.

ROSS-NAZZAL: So what are your feelings now that she's getting ready to leave? I know you said it wasn't such a big deal that last mission, [STS-133].

STILSON: Yes. You know, I think I'm still in the mode of it hasn't yet hit me, and I still don't think it will just yet. I go right from working on *Discovery* and getting *Discovery* into the space hangar to taking *Enterprise* to New York and getting her offloaded, and then I'll come back to Kennedy. The more I think about it, I think that's when it will hit me, when I get back here and realize I can't walk into that Orbiter Processing Facility and see *Discovery* whenever I want, or into the Vehicle Assembly Building when she's there and see her whenever I want. I think that's when the realization to me is going to hit of, "Wow, she's gone. She's no longer a part of our immediate family here."

It will be an odd feeling. I really don't know how I'll feel. I know I'll be sad, but I think more it'll be just an odd feeling. I think that's the best way I can describe it, is just odd, because it's been such a big part of my life for so many years. Not to say that I've taken it for granted, but you sort of do, right? When you know you have the freedom to walk over and see a Space Shuttle whenever you want, that's a really neat thing to do, and we're going to miss being able to do that.

So what will happen, though, is it will allow me to, I think, put some more emotion into *Endeavour* and *Atlantis* because I've not had strong ties with those vehicles because they were not the vehicle that I was assigned to. Maybe with *Discovery* being away, now my attention can

go more towards those vehicles and I can get to appreciate them even more. I have started doing that and it's been neat to learn some of the things about the other vehicles and be a part of that and give myself an opportunity to think about all the great things that those vehicles did as well.

I think that is how it's going to play out. Now, I may feel differently when I leave the space hangar before we head to New York, so that could be an opportunity for some emotion too. The team will still be actively working on *Discovery* to get it ready, so it will still seem like a work environment, because working in the space hangar at the Udvar-Hazy Center is somewhat similar to being in an OPF. We're going to be removing the tail cone and repositioning engines and going into the crew module, so it's going to feel similar to previous work.

ROSS-NAZZAL: When you come back, you're going to take over processing vehicles?

STILSON: Yes, when I come back then the focus will be on getting *Endeavour* ready to go out in September and then *Atlantis* ready to go in November. So I'll still be busy, but there will be a little bit of a lull compared to how it has been, just in the sheer fact of dropping from four Orbiters to two. But my focus will be on all the preparations and things that have to happen to not only get *Endeavour*, the vehicle itself, ready, but the preparations out at Los Angeles, the things that we're now doing at Dulles that we'll need to do at LAX [Los Angeles International Airport, California].

We've already been working that. We've had two site visits to LAX. We'll have another site visit probably in the July timeframe, and that will be the final time where we sit down with all the key players from LAX. I will give the same presentation I've given five or six times now,

but once again to look them in the eye and say, "You understand what we're doing. We're going to go drill 200 holes into your concrete, we're going to put up these masts, we're going to bring in a 650-ton crane and a 250-ton crane with booms that extend out to 175 feet. This is the final time for us to all look at each other and to hear them say, 'Yes, we understand, and we're okay with what you want to do.'"

All the airfields have been very supportive and helpful. I was a little bit nervous at the first site visit for each one, each one meaning Los Angeles, JFK, and Dulles, because it just seemed like there was a lot of head nodding, "Yes, yes, yes, yes, yes." I'm thinking, "Okay, they're not fully understanding, because I expected I'd have more questions or at least somebody saying, 'Well, wait a minute. Is that really going to be a good idea for us to allow you to do that?'"

But after holding three site visits at each location I felt much better. It gave them a chance to digest what we had said to them, ask questions, and then, of course, we work with them outside of those site visits. We're in contact with them from here, asking questions and sending drawings, and they send us drawings. So by the time we were done with the meetings in Dulles and JFK, I felt very confident that everybody was on the same page and understood the undertaking that we were about to do.

ROSS-NAZZAL: You're going to fill in the concrete, right?

STILSON: Yes. We go in and we fill in all the holes, yes. It'll be just as good as it was when we got there. That's the plan.

ROSS-NAZZAL: It's my understanding that *Endeavour* is supposed to be pulled from LAX through downtown L.A.?

STILSON: What we decided at the last site visit was that when we go through the offload operation for *Endeavour*, similar to New York, we will load *Endeavour* onto a transporter. Now, the difference with this transporter is we have given California Science Center a transporter that we have used in the Shuttle program before. It's called the overland transporter. Basically, it was used back when we would move vehicles from Palmdale [California] to Edwards [Air Force Base, California], and so we have pictures that actually show the use of it. Basically, it's a beam with attach points on it. It can be pulled by a semi truck of some sort, the way that we did it in the Space Shuttle program back in the eighties.

The attach points are basically the same as the SCA attach points, so once we get the Orbiter off the SCA and move the SCA out of the way, we'll bring in the overland transporter and we will lower *Endeavour* down on top of the overland transporter and secure it there. At that point in time, we spend about a week doing the final preparations for turning *Endeavour* over to the California Science Center. This includes removing the tailcone, repositioning the engine nozzles, closing the vent doors, and installing the Orbiter Maneuvering Engine nozzles. The transport of *Endeavour* from LAX to the California Science Center will be managed by the California Science Center and their contractors.

What I think you're referring to with the overland transporter is that SCS is going to use self-propelled motorized transporters under this overland transporter. They're somewhat modifying the overland transporter to support these independently operatable mobilized units. The reason for that, as opposed to using a tractor-trailer, is because of the precise movement that

has to happen during the course of the 12 miles that *Endeavour* has to travel from Los Angeles International Airport to the California Science Center. The route is through city streets of Inglewood and Los Angeles. During our first site visit at LAX, we drove the route. We've seen where they have to take down streetlights and telephone poles and, in some cases, trees, and there's actually one section that they have to maneuver through where there is less than an inch from each wingtip to a wall. I don't mean a wall that you can remove, but a building wall, a structure. That's why the California Science Center wants to use these mobilized units, because they can move in any direction very minutely to work their way through the route.

That is going to be quite an undertaking for them. It's 12 miles. It will take them two days to complete because they'll have to move so slowly. And if you think about it, it's hard enough to do that, but then you're also going to have a huge number of people lining the streets to watch. I envision it being similar to a parade route. I expect hundreds of thousands of people are going to be staged there to watch this move. You have that complexity of now managing the crowd on top of having to manage moving a vehicle. So whether it's luckily or unluckily enough, my team is not a part of that operation, but we will be anxious for them to be successful and for everything to go very well. Of course, we've helped them along the way giving advice for how to go about moving the vehicle and consulted them, but there is no responsibility from NASA for the movement.

ROSS-NAZZAL: Will you have more close ties with the KSC Visitors Center, being that you're right here?

STILSON: We will. That is the easiest of all the moves, really, because we're just going to move it on our Orbiter transport system down the road. Now, granted, they'll have to move a fence, and there are some things that have to be coordinated. It's not just a quick and easy thing to do, but compared to the other moves, it will take a lot less preparation to accomplish.

The thing that's unique about *Atlantis* is Delaware North [Companies Parks and Resorts], who is the contractor to NASA, that runs the Visitors Complex, will be contracting directly with United Space Alliance to prepare the vehicle to do the display preparation in the Orbiter Processing Facility. I will continue to manage that work. It's just that I won't be responsible for the contract that manages that work. The NASA organization that runs the Visitors Complex looks to me to oversee the operations on Atlantis to make sure everything goes well, but if I have any concerns, I will then work them back through a separate NASA organization, who will then work it through their contractor, the United Space Alliance. So it's a bit different. We haven't done anything like that before. USA will follow all of our same operating procedures and all of our same rules, so it will be somewhat transparent when we're actually doing the work. It's the contract side that will be a little bit different. United Space Alliance is under contract with Delaware North already, and so they're putting plans in place and plan to start some of this display work the middle of this month, so they should be getting started pretty quickly.

ROSS-NAZZAL: So when will officially T&R [transition and retirement] stop for you?

STILSON: When we deliver *Atlantis*, which is the mid-November timeframe, when we get it to the Visitors Complex, then my job is done. And I have to figure out what I'm going to do next. I have to figure that out before then, but, yes, that's where my work with the Orbiters will end.

Now, there could be something within the transition retirement efforts that are not Orbiter-related that I may be able to help with at that point in time. Our office doesn't go away when the vehicles are done because there's still facility work, equipment removal, and records disposal that isn't yet complete. So there may be an area that I can help out with, or I may do something completely different.

In fact, the conversation that I had with my supervisor when you were waiting was talking about, "You need to start thinking about what you're going to do next. You've got to start answering some questions as to where you're going to be." Not really something I want to think about right now, but it's not the first time he's told me I have to start thinking about it, so I need to start doing that.

ROSS-NAZZAL: I'm going to ask Rebecca if she's got any questions for you.

WRIGHT: I do have one. You mentioned about going or having *Discovery* being processed once it's inside of the hangar.

STILSON: Yes.

WRIGHT: So you will be involved with that?

STILSON: Yes.

WRIGHT: How long will that be?

STILSON: We're delivering on the 19th, we look to be out of there by the end of the month, so not too much work that has to be done. So the target right now is to be done by the 30th. That includes removing the tail cone and shipping it back to Kennedy since we have to use that tail cone again for *Endeavour's* ferry, then repositioning the engine nozzles, because to put the tail cone on you have to tuck the nozzles. We're going to flare those back out, because Smithsonian wants *Discovery* to look as if it had just landed. We will also reposition the vent doors and install the orbital maneuvering system nozzles. There are a handful of other things, but mainly just getting *Discovery* into the final display position, jack and leveling it, because we have to jack and level it to get the tail cone off and then put it back down on its landing gear when all the work is complete.

There will be a small team that complete the hangar work. In fact, I won't be there for much of that since I have to leave on the 23rd to go up to New York. My backup, Bart Pannullo will be there managing the work in the hangar and also the cleanup effort out on Apron W. So he'll be managing those while I'm up at JFK, getting things set up and ready to go for the offload of *Enterprise*.

WRIGHT: That's the real question I wanted to ask, how are you going to be in two places at once.

STILSON: I have very capable help, which is good. I get the fun work of setting up, delivering, and offloading. Bart gets to be there for offload, the final orbiter work, and the site cleanup.

WRIGHT: Sounds like a good plan.

STILSON: Yes.

ROSS-NAZZAL: Well, I think that that's it for us, and I think that we did it in less than 45 minutes.

STILSON: Well, great. Well, good. Thank you very much.

WRIGHT: Thanks for filling in all those blanks.

STILSON: Yes.

[End of interview]