NASA HEADQUARTER HISTORY OFFICE ORAL HISTORY PROJECT
ORAL HISTORY TRANSCRIPT

JAMES G. SOKOLIK
INTERVIEWED BY SANDRA JOHNSON
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JOHNSON: Today is June 26, 2008. This interview with Jim Sokolik is being conducted in Washington D.C. for the NASA Headquarters History Office. Mr. Sokolik is in Washington this week to participate in the NASA Program at the Smithsonian Folklife Festival on the National Mall. The interviewer is Sandra Johnson, assisted by Rebecca Wright. I want to thank you again for joining us today and taking time away from your activities. I want to begin today by talking about your background, and how that led to your career with NASA, and your work in high-altitude life support at the Dryden Flight Research Center in California.

SOKOLIK: Good morning. Surprisingly, my career where I'm at now started out—I was born and raised on a dairy farm in Wisconsin, and I thought that I was going to be a farmer like my father. Unfortunately, life has a way of getting in the way at times, and due to my parents' health concerns, we sold the family farm while we were still viable. I was without work. I was about 20 at the time. I said, "Well, I've got to do something with my life." I worked at putting lawnmowers together on an assembly line, I worked in a foundry pouring metal, and even put up silos for a while. I realized that although the pay was good, the job was getting me nowhere, so I joined the military when I was 22. I had a select number of fields I could go into. Life support, at the time, seemed to be the one that got my attention the most, so I went into the life support career field.

I was stationed out of technical school at March Air Force Base in southern California. I worked with B-52 bombers, tankers, some 130 aircraft, miscellaneous other aircraft, for about a year and a half, until our shop downsized because they were retiring the B-52s we were working on. At that time, I had made a reputation as somebody who was a hard worker. Of course, I didn't have a lot of rank at the time, so when they downsized my squadron, they said, "You're an ideal candidate to go up to Beale [Air Force Base, California] to work with the U-2 and the SR-71 program," and again, those were the suits that I work on now.

I jumped at the chance, because the SR and the U-2 had made an appearance at an air show down at March when I was there. And those life support people had come in there at the time and they had brought in these fancy full pressure suits, and I was looking at them, and I said, "Man, that's a job I want to do someday. I really want to work on that stuff," never thinking I'd have a chance. So when the opportunity presented itself to actually get to do that kind of work, I jumped all over it.

So I went to Beale, and I was a section supervisor even though I had such low rank, and I worked up there for five years supporting the U-2 and SR-71 aircraft. I'd come to a point in my life where I had to make a decision whether to stay in the military or get out, and as chance would have it, NASA opened up a slot as a contractor, working at the Ames Research Center up in Sunnydale [Moffett Field, California]. I immediately jumped at the job because that was like going from basically Triple-A to the majors, if you will, to put it in a baseball format. I'm in the big leagues; I'm working for NASA. That's the pinnacle of life support, as far as I was concerned.

So I came on board in August of '87. Here, in just a couple of months, I'm going to celebrate 20 years doing the same kind of work. I still love it as much today as I did the first day

I walked in the door. But that's how I got from where I was to where I'm at now. When I was a farmer, I never thought that I would be where I'm at now. To me, it's just amazing, from where I started to where I'm ending up. You never can plan for the future and where you're going to be.

JOHNSON: You said that life support got your attention, and you joined the Air Force. Did you have any interest in flying yourself, and why did life support, do you think, pique your attention?

SOKOLIK: I don't know. I really don't like flying. I've never had the least ambition at all to be a pilot. Life support, I don't know. When I went in there and they said, "These are all the jobs that you're qualified for"—and there were quite a few. I looked at them, and I just kind of narrowed the list down, and life support just seemed to jump out at me. I have no idea why; I can't explain it. Somebody asked me when I took the career field, said, "Why'd you get into it?" I said, "I don't know, it just appeals to me."

JOHNSON: Let's talk about your position now and the work you do. Has your position changed? You said you're going to be here 20 years in August. How much has your position changed over the years, and if you can kind of explain what you do right now at Dryden?

SOKOLIK: The only thing about the job that has changed over the 20 years is who I've been working for. I started out as a contractor for Lockheed Martin [Corporation], from '87 until basically August of I believe it was '06. I became a CSC [Computer Science Corporation] employee for three months before I went civil service, in September of '06. The job itself hasn't changed because I still work on the same equipment, although there have been improvements on

the equipment. But a full pressure suit is a full pressure suit regardless of what style. Nothing has really changed. Level of responsibility, perhaps. I started out as a technician, I worked up to a shop lead as a contractor. As a civil servant I'm now a technician, but the technicians as a civil servant actually do more work than leads as a contractor, or the equivalent. But the job hasn't changed much in 20 years, as far as from my standpoint.

JOHNSON: Let's talk about the job itself and what that entails, and what you do. You can do this by maybe giving us a typical mission, and when your involvement with the mission would start, and when they're going to fly, and the plane that you work with—I believe it's the ER-2. Then about how that evolves and how that mission evolves, what your involvement is, and what you do from the beginning all the way through the end of the mission.

SOKOLIK: Okay. That is basically a small part of what we do. When a mission is slated on the books, normally I have about 24 hours notice. We go through a procedure of preflighting the suit that the pilot's going to wear. We currently have two pilots. Each pilot has two suits, a primary and a backup. We try to keep all the suits operational at all times. We don't want to lose a mission because a suit has a problem. We'll go through a process of preflighting the suit, which takes approximately an hour. The suits are monitored very closely as far as the pressure checks, the com [communications] checks, that type of thing, and it's a very extensive inspection that we go through to prep the suit. Of course, since we're flying these pressure suits in airplanes, they have parachutes and some other survival equipment, which we also have to go through and prepare. This is all the day before.

The other thing is that the pilots have to pre-breathe oxygen an hour before they take off to get the nitrogen out of their bodies, to keep them from getting the bends. So we have to actually go out and fill some portable liquid oxygen dewars [containers] that we use for the pilot to breathe on and for transport purposes. This again is done the day before or the morning of, but that cuts into your time on that morning.

That's all day before. The day of the mission, we'll come in about three hours prior. We'll go to a briefing with the pilot, find out what the story is on the mission, if it's a go, what the duration is. If it's a long flight, we'll ask the pilot if he has any special requests of us as far as we supply them their tube food that they eat, the liquids to drink. Ask them what they want to take on the mission, just those—a couple of personal questions. At that point, we'll go out and we'll actually load the survival kit and the parachute in the airplane, do a number of checks on the emergency oxygen systems while we're there. Then we'll come back to the shop, actually lay out the suit in the way that's comfortable to the technician that's actually dressing the pilots, just putting things out where they know where they're at. The pilot will come in about an hour and fifteen, hour and twenty minutes before scheduled takeoff time, and we'll put the suit on the pilot. He can't do it himself. You have to assist him. That takes about eight, ten minutes.

Then we sit him down, he goes on oxygen, and then we'll go through a series of checks of the suit with the pilot actually inside the suit. This is actually the most important part of the inspection process. Because you can inspect a suit by itself, and it can pass and be fine. Once you put a pilot in it, you're adding a lot more variables. The pilot's wearing underwear. The pilot actually—well, most of them have hair still. But all those come into play, although they sound minor, because when you're putting the helmet on, if he has four or five strands of hair that gets caught in a seal that goes around his face, the helmet will fail the pressure checks. Or if

you get a couple of strands of cotton thread from the underwear that he wears underneath it, it gets caught in a connection where you put the glove on the suit, it will make the suit fail because the leak checks we take are that minute. So we go through a full series of checks with the pilot suited up, and of course at any time, if anything fails, we either fix the problem on the spot, do some troubleshooting, transfer him, take him out, put him in his backup suit, or cancel the mission. There is no room for error in this career field, in what we do.

At that point, we'll take the pilot out to the airplane. Again, once he's suited up and he's wearing the big old gloves, the pilot's dexterity is very limited. That's why there is what we call a mobile pilot that actually goes out with us, and he will actually go in ahead of the pilot. He'll set up the cockpit, prepare everything. So the pilot that's actually the mission goes up there, sits down in the cockpit, literally puts his arms back, and the life support technician, myself or somebody else, will actually hook him up in the airplane. Because he can't do it himself. That way literally all the pilot basically has to do is start the airplane and go fly it.

Now, the characteristics of the airplane we fly, the reason that we monitor him so closely, is that the ER-2 flies at altitudes at or above 70,000 feet. Which basically, so I've been told, is in the upper 5 percent of the Earth's atmosphere. Well, at 70,000 feet, you're above what's called Armstrong's line. That's a little invisible line in the sky about 63,000 feet up where—that's kind of the point where from a physiological standpoint, the human body is basically in space, because there's not enough pressure in the outside environment exerting pressure on the body to keep the oxygen inside the bloodstream. The pilot would have a problem flying at the altitudes we do without a suit. The oxygen would be pulled out of his body faster than we could push it in, and the pilot would be unconscious, blacked out, within a matter of about 10 or 15 seconds. Even though he's breathing oxygen, his body's starving.

That's why they wear the suits, and that's why we monitor them so closely, because if something does happen, the suit has to work every time. Otherwise you lose a pilot, an airplane, and of course out at Dryden, we have a lot of one-of-a-kind instruments. Even though we're an operational outfit, a lot of scientists will bring us in one-of-a-kind, experimental stuff to fly, and it has a long-ranging effect if we have a problem. So that's why we wear the suit. The pilots are very comfortable with it. The track record on the suit—it has a very, very good track record.

JOHNSON: How do you monitor them during the flight itself?

SOKOLIK: We actually do not monitor the suit during flight. Our suits are generic in that aspect. We just inspect them on the ground. I mentioned we do a preflight with him in it. Once we actually plug him in the airplane, we actually do another series of checks to make sure the suit does inflate. Then when they come down, we inspect it again, so they get inspected four times every time they fly. But once we plug the pilot into the airplane and do the checks, the suit's on its own. It basically goes automatic. It senses pressure, it just does everything it's supposed to without any outside monitoring by us or by the pilot.

JOHNSON: How often do those suits fly? What is the lifespan of that type of suit?

SOKOLIK: The lifespan of the suit is 13 years, which is surprising. I tell the people the price of the suit occasionally, and they're just shocked by what is the price of the suit cost. I'm not going to say how much it costs. But when I tell the people that the suit lasts 13 years—and most people don't have a car 13 years. But again, you look at it from the aspect that if the airplane's

flying—and everything breaks sometime. Everything breaks regardless. But all you have to have is the airplane has to hiccup once. An engine quits. A canopy seal ruptures. A little 12-cent part decides it wants to break, and all of a sudden you have a problem with altitude. All that suit has to do is work once in 13 years, and it brings everybody home. If you look at it from that aspect, it's a very, very cheap piece of equipment.

I've been with NASA 20 years, going on 20 years, and I've had the suit—on two of my launches—I've had the suit go operational twice in 20 years, which is a pretty good track record, considering. NASA, we have a lot of good people, so we don't have a lot of problems. But both times, surprisingly, were non-emergency situations. We had once where a pilot was going up in altitude, and he called back on his radio. He was going through about 40,000 feet, and the suits go operational about 36,000. Before that, they're pretty much dormant. He called back and said, "Hey, I'm going through 40,000, my suit's starting to get a little bit puffy. I think the suit might be malfunctioning." They said, "Well, did you turn on your canopy seals?" "Oh. No." So he hadn't pressurized his cockpit. Turned them on, the suit deflated, he said, "I'm sorry, my bad." I said, "Hey, no problem."

Then about a year and a half, two years later, basically the same thing happened. A pilot was going up, up 40,000, whatever, and he said, "My suit's starting to inflate." I said, "Did you turn on your cabin pressure?" They said, "Well yeah, my light's on. It says I have." I said, "Well, let's go ahead and recycle it." He had a faulty switch. Recycled it, and the cabin pressure came on, and the suit deflated. So we just kind of laughed them off and said, well, they're just operational checks on the suit, to see how they work.

But we've never had, since I've been on board, never had an emergency high altitude inflation of a suit. I don't want to have one. But I have ultimate faith in the suit that it will do its

job if it has to. So do the pilots. Just to the point that from the time that we dress them, there's about a half hour waiting period while they get their oxygen breathing in until they get in the airplane. We have this big recliner in our truck. These guys fall asleep. Literally, you walk up there, and you'll start talking to them. They'll have their dark visor down, and they're sitting back there. People come in, and they'll just start talking to them, and they're asleep. They're so concerned about flying this airplane, these extremely high altitudes, it's hazardous, and they have so much faith in their people and the airplane and the equipment that they can fall asleep. It's amazing.

JOHNSON: You mentioned the suits last 13 years. Has the technology in the suit changed a lot since you've been working with it, or is it still basically the same technology as when you started?

SOKOLIK: The technology basis hasn't changed. I actually called and talked to David Clark [Company], who's the maker of this suit, before I came here, because I just wanted to make sure I had my information straight. The technology of the suit goes back to the late '50s. The suit that they're wearing today, the concept and design was originally built in the mid '60s for the SR-71 program. Of course the SR-71, everybody's familiar with that—high altitude, very fast airplane. But you couldn't ask a pilot to get inside an airplane like the SR and go to the altitudes that it flew without giving him some assurance if they have a problem, they had a chance. So they built these suits. They were called the S1030 suits, that was the name they were given, and they flew those in the SR-71.

Now, just a little sidebar, the first four [Space] Shuttle missions, NASA actually went to the military and got some 1030 suits from them, sent them back to the manufacturer, had them modified into I believe it was called a 1030C suit, and they flew those on the first four Shuttle missions, suits that were originally designed for the SR-71. But over the years, the materials and the ability to work on the suits has changed. The design is still relatively the same, but the materials we use—they used to use non-breathable material, now they're using Gore-Tex, which is a breathable material on the suit which is more lightweight, cooler for the pilots. Some of the hardware on the suits has been modified over the years to make it more user friendly to the pilot and the technicians such as myself to work on them. Every 13 years a new suit comes out, so there's always changes.

But the concept is still the same. If I take a 1030 suit that was designed for the SR-71 that was made 30 years ago and set it down next to a suit that was made last year, the casual observer off the street would look at them and say, "Okay, they're different colors. That's a dull yellow, that's bright yellow." Okay, well one's really old, one's brand new. It hasn't had a chance to fade yet. But they really wouldn't be able to tell them apart. Then the suits that they wear on the Shuttle today—and I don't want to go too much into the Shuttle because that's not my area of expertise by any means.

But again, according to the manufacturer, David Clark, the Shuttle suits and the suits that we fly in our ER-2s currently, are about 85 percent identical. Made with the same hardware, the same parts. At the factory level, they're tested to the same criteria. Because the environment's the same. Because flying at 70,000 feet in an airplane and flying inside a capsule on the Shuttle, both are hostile environments to the pilot. The suits work the same way in both environments from an operational standpoint.

JOHNSON: You mentioned the dexterity, and that they have to put their hands up and other people set the cockpit up and everything to fly. When they're on the plane, the pilots, and they're involved in whatever their mission is, the experiments or the photography or whatever, how are those set up so that they have enough dexterity to do what they need to do during the missions?

SOKOLIK: Well, it's a culmination of factors, actually. Sometimes they'll have easy to reach switches. Not normally the case, but the gloves that they wear, we try to get them to as close to a perfect fit on the hands as possible. That's just part of the custom-fitting process when we put the pilots in the suit. But we try to set it out that when they stretch their arm out to touch a button, the process of doing that will stretch the glove, will pull the glove ring back on their wrist, and will basically put their finger at the tip of their glove, which will if not give them max dexterity, will at least keep them from having a lot of extra cloth at the fingertip, so they don't try to press one button and they get two or three.

Some pilots, actually, they have a couple of pencils in the cockpit. Sometimes they'll just pick up a pencil and turn it around and use the eraser end to push buttons. It's all a matter of what the pilot wants to do, what the cockpit configuration is. Everything changes with what you're doing, and there is no set method. If a pilot comes back and say, "Hey, my gloves just aren't fitting right, I just can't do anything." Well, at that point we'll address the problem. But until he tells us he can't do something—if we don't know there's a problem, we can't fix it. It's up to a pilot to tell us, "Okay, I'm having an issue."

JOHNSON: You mentioned that getting ready for these flights was a small part of what you do. Let's talk about the rest of what you do in your area.

SOKOLIK: That is probably the best part of my job. You never get into a rut. You do most jobs here start to finish. When you aren't launching the airplane, the suits have scheduled inspections every so many days or so many flight hours, whichever comes first. When you start putting a lot of time on the suit, it brings their inspection dates. But when you inspect suits, there are a lot of subcomponents to the suits. The controller, which is the part of the suit which monitors the pressure, tells the suit when to inflate, how much pressure to hold—that is just one of a number of subassemblies, just like the regulator in the back of the helmet. We actually have to take those off, and we put them in altitude chambers. We take them to altitude to do inspections on those to make sure they're working properly. The survival kits that the pilot wears—that he sits on—we're responsible for taking those apart, doing periodic inspections on those. Of course, they contain emergency oxygen systems which we have to check and monitor.

As a very small shop, we do our own calibration. We have a very large calibration kit that we send out to have calibrated at our facility, and we take that and we calibrate the rest of our test equipment off that. Myself, I'm a licensed parachute rigger, which means I can repack parachutes. I don't currently do that, but I have the certificate to do so if need be.

That's just my little part. I'm also part of a larger shop that does egress, which means that on any given day, they might ask me to go out there and help pull the ejection seat out of our ER-2, or to go over and work on an F-18, or an F-16, or any other aircraft. It's just whatever has the priority that day. My specialty is working ER-2s and suits, that's about 98 percent of my job. But I'm always available and willing to go over and work with the rest of my teammates in my

group to work on any other airplane. When you come in to work today, you have kind of a general idea of what you might want to get done that day, but at any time you could be called out on something else. So you never get bored, you never get in a rut, and that's kind of the nice part of the job. It's far reaching. It makes it enjoyable, actually.

JOHNSON: You mentioned your team. How many are typically on the team you work with?

SOKOLIK: That varies depending on what aircraft we're working on. With the ER-2, we work in teams of two. I'm currently in the process of working with a couple other gentlemen to get them qualified at this point. We have a group, I believe we're about ten people now in our life support shop, and everybody kind of has a specialty at this point because we're an expanding process. Because everybody has a specialty, we're in a serious buildup, shall we say, of cross-training everybody. Where if you have a few extra spare minutes—well I'll go off and work on something else, somebody else will come in and work with me.

It's an effort to get the whole shop familiarized with what everybody does, which in the long haul just benefits everybody. It gives you a lot more flexibility. But right now, there are myself, there's another gentleman that has a few years of experience that I work with, there are two primaries in my little piece of the shop. But we have another gentleman we're getting up to speed very quickly.

JOHNSON: Well, let's talk a little bit more about the suit itself. You mentioned that they were custom fitted for the pilots. How are they actually made and custom fitted? Does your shop have anything to do with that part of it?

SOKOLIK: I was talking to some people yesterday, and they were asking basically the same question. The suits are made by the David Clark Company. It takes approximately six months to make a suit, and that's from getting the size—there are two major components to the suit. I mean, of course there's the outer garment, there's an inner garment. The two main things are the pressure bladder that actually holds the pressure in an emergency, and the other one is a link net material that David Clark makes. And the link net, once it's assembled, is very, very strong. That link net is what gives the suit its human shape, its contour. It keeps the pressure bladder from what would turn basically into a big balloon.

The reason I kind of laughed was that I was at David Clark, and this link net material that they put together, although it's strong when it's assembled, it's relatively fragile when it's not, and it can't be put together by machines. Literally, parts have to be knitted together. So there are people actually knit together this link net, a very time-consuming, very intricate process to watch them do it. I couldn't do it myself. It's just amazing to watch them do it. Not all of it, but just parts. But that's part of the process of why it takes so long.

But that link net is joined together in various places by panels. It's held together with some very high-test cord, and those panels allow us to take a suit—they come in 12 sizes. We can just look at somebody. We take their height, their weight, whatever, and a nice little chart tells us approximately what size suit to give them. Well, we get that suit, we put it on them, and then we go through this very long and intense process of adjusting these panels, these cords, to get the proper fit. Because the elbows of the suit have to be made where the elbow of the pilot is, and the same with the knees. The legs can't be too long because you got to have dexterity with the feet as well, for lack of a better word.

So when the suit inflates, the suit has to be working with the pilot to fly, because if a suit inflates at a high altitude, it's going to be holding two, two and a half pounds of pressure, which means that movement is going to be extremely limited. It's going to be hard to do anything. So when the suit inflates, it inflates in a sitting position with the hands on the yoke, literally, so the pilot can just move his thumbs to activate his radio buttons or whatever. His feet are on the rudder pedals. So he can fly the airplane for long periods of time with minimal effort, working with the suit instead of fighting against it.

The custom fitting process, if you get lucky, you can do it in an hour. That's with two people. Because there are panels in the legs, there's panels in the arms, the chest, the waist, and there's a main zipper that goes basically from the waist up the back to the nape of the neck. You just can't start pulling in panels arbitrarily, because you do that and now you start putting torque on the zipper, which could affect the zipper over the long-term. So you have to do it just a little bit at a time, evenly both sides. It's a very time consuming process.

Then of course the pilot, then, is required to keep his weight very close to the same on a year-round basis. Because if he puts on a lot of weight, takes off a lot of weight, now we have to readjust the suit because when it inflates it doesn't fit him properly. You might have a tight spot, you might have a loose spot, which could hold or restrict pressure movement. So the pilots are very careful about their weight because the process of going through the adjustments is time consuming. It’s uncomfortable for everybody, we don't like doing it, they don't like doing it. So it's a whole lot easier for them just to control their weight than it is to come to us and say, "I need to let my suit out, I need to take my suit in." Of course we make them feel real bad about having to do that. Instead of having to listen to us tease them, they just—

JOHNSON: It's easier to exercise and keep the weight down, right?

SOKOLIK: You bet. No, our guys are all old hands, they've been doing this for the last 10, 15 years of their life, give or take, flying the suits. They know what they have to do. It's not very often we have to do a suit fit. Normally the only time it really happens is when we have to get them a new suit, when they're due a major depot inspection of some kind, and we have to issue them a new suit, then we have to go through that process. Once every couple of years is enough.

JOHNSON: When you were talking about your team, you mentioned that you have a couple of people that are coming up right now and training. What is that training process like to get to work in your area, and how does that happen? Is there some prerequisite that's required before people come into you area, and then how are they trained?

SOKOLIK: Prerequisites are kind of a grey area. The one gentleman that I have with me, Josh [Joshua Graham], he spent four years in the military, basically worked out of the same military life support shop I did. So his background, he came to me with a lot of experience. So his training was more refinement than anything else. And he's a sharp troop as well, so that makes a big difference.

A lot of the other people I'm working with are egress people, and although they don't know a lot about the pressure suit environment, they have a lot of training on aircraft and aircraft ejection systems, which are kind of a parallel career field, if you will. So even though they don't know the specifics, they know the generalities, so it's a very easy transition for them. Everybody in our group, like I said, everybody has a specialty, but everybody's specialty kind of wraps

around the life support/egress environment. So somebody comes in who's never seen a pressure suit before is going to pick up on it very, very quickly because they're part of the environment, and that's what makes it really easy to train somebody.

JOHNSON: You mentioned that he came from the same shop, the military area that you came from. Since you've worked on the military side and now in the NASA shop, how do those shops compare? Are they run similarly or are they different?

SOKOLIK: Kind of a loaded question there. I really don't want to address that issue.

JOHNSON: Okay, that's fine.

SOKOLIK: I really don't think I could be fair trying to make a comparison.

JOHNSON: That's perfectly fine.

SOKOLIK: Both of them are very, for what their mission is—I got some fantastic training in the military, as did Josh. But the environments are entirely different. The training and the quality of the work is the same, but just how you go about doing it is entirely different, and I think I couldn't do either one of them justice. Myself or them.

JOHNSON: That's fine. Have you ever been in a suit yourself?

SOKOLIK: I have. That kind of leads to another little story, if I could indulge you on that. Nice thing about doing what I do is there are visual aids. You can't go into an egress shop that has ejection seats and actually light off an ejection seat to show somebody how it works. You can't do that. But at Beale, where I got my military training, they have a lot of altitude chambers, and they're always constantly checking suits, or they're giving pilots training. To actually see a pilot get dressed and go inside a chamber and go through a decompression training, where he's just hooked up in a simulated seat inside a chamber. And they just have him go through the motions and just know where everything is, and then they do what they call a rapid decompression [RD]. They'll take him up to 68,000 or 70,000 feet, just simulate the canopy blowing off or some such event, and just to watch the suit instantly inflate.

Then they take a beaker, a glass beaker of water, and they'll put it on a big chair, the table beside the pilot, and when that suit inflates and you look down there and that water is boiling—because that's what happens when there's not enough pressure. Air comes out of the solution. The pilot's sitting there like this, and it's all inflated around him, and that beaker of water is just boiling like crazy, and then the pilot goes through his training. Going through emergency procedures is great training.

I actually had the opportunity to get in a suit and be strapped in that seat and have that beaker of water there beside me. We had some visiting VIPs come through, and they wanted to make a demonstration, they asked for volunteers, I said, "Please, yeah. I want to go in." So I got in there, got all set up, beaker of water down there, and I'm listening on the headphones as they're giving the demonstration, and they said, "Okay, now we're going to do the RD," and boom. That suit inflated around me. I'm like, "Man, this is neat." I looked over, and I see that bubbling beaker of water. I said, "You know what? Without a suit, that would be the air coming out of

my bloodstream." It gave me a realization of really what I'm doing for the pilot. I literally put myself in his position. It gives you more appreciation for what you do.

When I went through and got my parachute rigger's license, the first thing that they asked me when I went into the class, they said, "If you get your certificate," my FAA [Federal Aviation Administration] certificate, "will you jump out of an airplane?" I said yes. So I went through the class, I got my certificate for my rigger's license, I went skydiving. Only did it once. But again, you get appreciation for the things that you do.

This next story you could cut if you want. It's a little bit corny. But we had a pilot named Jan Nystrom. He's retired now. But we were stationed in California, and his wife and their children lived in Florida on a ranch, so they basically lived separate. He flew back to see her every chance he'd get, and they would try to meet up—if we were TDY [Temporary Duty], they would hook up together. Other than that they kind of lived separately, unfortunately. Her name was Sarah, and I'd never had a chance to meet her, and I'd been on the program with Jan about six years.

Finally, we were back in Wallops Island, Virginia [Wallops Flight Facility] on a TDY. Me and my wife are walking across the parking lot of our hotel, and I look across and here comes Jan walking across the parking lot, and he's got this lady on his side, which I knew was his wife by descriptions. I'd never met the lady, never talked to her on the phone. We just naturally veered toward each other, because we were going to make introductions. I got about eight, ten feet away from her, I was just getting ready to say something, and she just ran right out in front of Jan right and gave me this great big hug. I had never met this lady before! She whispered in my ear, she says, "Thanks for taking care of my guy."

That sticks in my mind so vividly, because that's the reason I do my job. Not for him—a little bit for him. But for her. I know that sounds corny, but that's one of those things that I never forget, and every time I'm having a bad day I think about that. That's why I do what I do. Thanks for indulging me on that one.

JOHNSON: No, that's fine. I'm sure the pilots appreciate what you do every day for their family and for them.

SOKOLIK: I'd like to think so. Don't tell them I said that.

JOHNSON: You mentioned traveling to Wallops Island, and from what I've read, you've pretty much traveled all over the world with your job.

SOKOLIK: Seen a little bit of ground.

JOHNSON: Let's talk about that, how that travel comes about, and why you travel, and what you do when you're on travel.

SOKOLIK: Travel's a lot of work for the most part. Stateside traveling is a lot easier than traveling overseas, of course. It all depends on the mission. My first 10, 12 years in this program, we were heavily involved with ozone research, chasing ozone holes around the world. Arctic, Antarctica. We were everywhere from down in Puerto Montt, Chile, to Stavanger,

Norway, in New Zealand, Australia, Fiji. Wherever they had the best locations for catching data was where we went. We ran all over the world chasing ozone holes.

Got some great data. Of course, data takes so many years to be evaluated and put in perspective, but we would just come by and the scientists say, "Yeah, our system worked, got great data," and we'd just go on to the next location. You'd go in there, you'd put in some long hours, sometimes 60, 70 hour weeks because you're flying seven, eight hour missions. Then you might have three or four days in a row that the weather doesn't cooperate, so you get your time off. But the traveling is nice, I got to see a lot of the world. Didn't get to do a lot of tourist stuff.

JOHNSON: Do you still travel a lot, or is that something you don't do as much?

SOKOLIK: I don't travel as much now, mainly because we haven't had a lot of overseas deployments. The last one we had was to Costa Rica. It was a nice little deployment. But I'm at the age now where I've been traveling anywhere from two to fourth months basically for the last 25 years, and although I like to see new places, traveling is starting to lose its appeal a little bit for me personally. Plus we have the younger guys that are coming onboard that are really anxious to basically see what I have already seen, so I have a tendency to sit back a little bit. I'll stay in the background. I'll kind of let them get their feet wet, get a few experiences.

JOHNSON: When you do travel or when you did, and when they travel, what are the logistics of getting the equipment and everything that's required for you to do your job and your checks and everything to those locations?

SOKOLIK: From my personal standpoint, it's more preparation on the front end. We actually have our logistics people that take care of the shipping. Not much to it, actually, from my standpoint. It's just making sure that what I need now doesn't get shipped ahead so I don't have it. That's about it.

JOHNSON: Do they basically ship the shop to these locations, or do you just have a pared-down amount of equipment?

SOKOLIK: I just have a pared-down amount of emergency stuff and bare necessities. We don't take a lot. That's on the preparation on the front side, is if we know we're going to be on the road for 30 days or 45 days or two months or whatever, we'll prep all the equipment—which are on inspection cycles—we'll prep everything before we go so nothing comes due schedule-wise while we're gone. So when you're in place, all you have to worry about is literally launch and recovery of the airplane and sustaining flight operations. You don't have to worry about anything else. It's just a matter of putting stuff in boxes and giving it to our supply people. They're waiting for us on the other end, so it's not a lot to that aspect.

JOHNSON: How do you actually get there? Is it through NASA planes, or is it through commercial aircraft?

SOKOLIK: Normally it's commercial. Occasionally, it's military transport. Very, very occasionally, depending on where we go, we have flown once or twice on NASA aircraft. But mainly it's just commercial. The last time, when we flew to Costa Rica, we did fly military

transport along with the equipment we were taking. It all depends on the circumstances of where we're going. Everything's different.

JOHNSON: You've been with NASA like you said for 20 years, both as a contractor and now a civil servant. Do you have any feelings of how the Agency itself has changed, and the aeronautics role has maybe changed during that time period that you've been here?

SOKOLIK: I really don't have an answer to that question, unfortunately. Our group is just so small, and I don't see the big picture, unfortunately. I'm just now starting to see the big picture or get an idea of what the big picture is. But I really can't. I couldn't answer that question because I don't know. I'm just now starting to open my eyes to something other than my own little piece of the world, shall we say. I would really like to see aeronautics flourish because there's always stuff out there that needs to be explored, stuff that needs to be tested. In my opinion, there's a great need for aeronautics, and of course from the operational standpoint that we're on, there's a lot of research out there that still hasn't been gathered yet.

JOHNSON: Speaking of that, during these missions with this ER-2, they do the photography, the different observations. I was looking at a list, the global radiation budget, climate change research, satellite sensor systems and development, disaster assessment. How do you feel that that affects the every day person, or how does NASA's research in this area effect or impact society as a whole?

SOKOLIK: Wow. I have no idea how to answer that question.

JOHNSON: Okay, that's fine too.

SOKOLIK: I have no idea.

JOHNSON: Well, the benefits of the research. You mentioned that there's a lot still to be done.

SOKOLIK: Well, yes. There's always new sensors out there that are being made to test new parameters and look for new things that are constantly going on, things that we've never tested for before. There are always people with new ideas. There's just stuff that hasn't been made yet. We just don't know what it is yet. The only way I could probably answer your question is NASA has a little handout that I take to schools, and it's just a little cardboard placard on it, and it's just one of those things that'll show a house or a small city or whatnot as you look at it, and as you tilt it, the view you're looking at, it'll change. It shows you the improvements just to everyday life that NASA or the Space Program has had an impact on, whether it be just making airplanes quieter, or the bed you sleep on, type of thing. I passed it out to kids and said, "These are just some of the advances, the technology that has been transferred over to the private sector that has been developed for the Space Program or something that has been captured by NASA or some government agency or whatever that has improved personal life."

We take them for granted. I take them for granted. I look at that and say, "Hey, this is neat stuff." There's some stuff in there I didn't even know. I was like a little kid flipping this thing, "Oh, that's cool." So that's about the only answer I could give you. It's just you never know what's coming down, and something small and minute could have far-reaching effects.

JOHNSON: You mentioned speaking to kids. Do you do a lot of presentations for school groups?

SOKOLIK: I do a lot, and I don't do near as many as I would like to. I'm a member of the NASA Speakers Bureau at Dryden. I probably hit maybe 30 or 40, about 30 events a year, whether it be a school career day, maybe being a guest speaker at the local astronomy club's monthly meeting, this type of thing. I like to get out there. I give a lot of tours in shop, a lot of the NASA tour groups. I work with the Public Affairs Office, and they're constantly bringing people through, and sometimes they'll tell me who's there or sometimes not. I mean, I gave a tour one day and I took a little beaker of water out to my little, small chamber and boiled it to show them the air out of solution and explained how the space suit worked. Found out after the fact that one of the guys was a retired astronaut. So they won't tell me who's coming through, but they'll be in groups of three or four.

But the biggest thing is when I get the kids. The kids will come through there. We just had your big bring your children to work day at Dryden, and of course mine was one of the stops. The parents will tell me, they say if nothing else, the kids will talk about the life support guy and the pressure suit and boiling the water. If nothing else, they remember that. Of course, I can't take that on the road. But I love talking to children, just to see their eyes get all big, and it's literally the best part of my job is talking to people about the suit, better than talking about myself.

JOHNSON: What are you most proud of when you look back at your career with NASA?

SOKOLIK: Wow. I don't know. Wow, I really don't know how to answer that. It's kind of hard for me to pinpoint something specific because everything's a team effort. I might talk about the suit and people point at me and say, "Yeah, that's the suit guy," but I'm just a small part. I'm a cog in the big picture, and okay, I had a little bit of what's called maybe a high profile job. Still, I'm just one little part in it. To actually say what am I the most proud of, I'm proud of the fact that, again, the pilots' wives wanting to give me hugs. That's the first thing that popped into my mind when you asked that question. That's what I'm proud of.

I guess that maybe in my career field, from where I started and the way I worked up, that maybe I'm the first person that people go to when they have a question, whether it be here or—I get calls from people outside the Agency, private parties, that'll have space suit questions. Maybe that I'm the first person they think of, or when they call somebody at NASA, I'm the person they get referred to as being maybe somebody who's good in their field. Of course, working for NASA itself, like I said earlier, is—I could be working possibly for the Shuttle Program.

I don't think I would like it as much as what I do now. Again, that's just speculation on my part, because I really like my job and what I do right now. I can't see it being any better anywhere else. I also feel like I'm at the pinnacle of my career field. Again, that's my impression. When you feel like you're at the pinnacle of your career field, and people on the outside kind of acknowledge that as well, I guess that's what makes me feel the best. Is that I've been here this long, and I have the reputation, or people think enough of me to come to me with those questions. I think that's what I'm the most proud of.

JOHNSON: What would you say to someone that was considering a career with NASA?

SOKOLIK: I had somebody ask me that question yesterday. He says, "What do you have to do to get into NASA?" They went on saying, "Is it because of this, is it because of that, do you have to know somebody?" I said, "No. You just have to be very good at what you do. You have to excel, you have to set yourself apart," because NASA by itself is very small compared, I mean, people think NASA's huge. You just have to set yourself apart—again, this is all my opinion—and make yourself noticed.

Kids in school will ask me, they say, "What do you have to do to go to NASA?" I say, "Well, be good at what you do. Go to school, go to college." "But what should I go, what should I be? Should I go to math?" Well, I say, "Yeah, math is always good." But not everybody at NASA is a rocket scientist. I mean, I've got a business degree. I don't use it, but I have it. But NASA needs photographers, they need writers. Just go to college, excel at what you're good at. Do what you want to do, be what you want to be, and get good at it. Then if you want to go work for NASA, fine. If you want to go work for somebody else, fine. But give yourselves the options, and don't give up on yourself.

Like I said, I was a farmer. Thought I was going to be a farmer all my life. Never thought I was going to go to college and get a degree. I got a degree. Never thought I'd be where I'm at now. Look where I'm at. You never know where you're going to be ten, twenty, two years from now. You never know. So never give up on yourself, and just find something you like and do it. Then just look for the doors that open. That's what I tell them. Kids seem to like the fact that there are numerous doors that are open to them. You don't have to be a pilot, you don't have to be an astronaut.

JOHNSON: How did you get involved with the Smithsonian Folklife Festival, and what are you going to be doing while you're here?

SOKOLIK: Well, hopefully talking to a lot of people. Two or three years ago, Tony [Anthony] Springer, who is one of the people up here at NASA Headquarters [Washington D.C.], I believe, in the Public Relations Department, he came through Dryden, and he was on one of my tours when I gave a talk. I didn't know who he was until after the fact. He came by, and he said, "That was a very good presentation, and we need to get you up to Washington sometime to maybe talk about this." I said, "Fine," just didn't give it a lot of thought.

Then when the Folklife Festival came up, I was talking to our Public Relations people at Dryden, they say, "Some of the people up at Headquarters asked if you were available because they've been through some of your tours before." I said, "Oh, really?" That made me feel pretty good. One thing just led to another. Was I available? Yes. Could I support it? Yes. And here I am. I came up with one of our ER-2 pilots, and of course a couple of the Public Relations people from the office. I'm just looking forward to the next two weeks. Yesterday was the first day, and it was fun. I thought it was kind of slow actually. I like it when the people don't stop coming. It makes the day go a lot faster.

JOHNSON: Well, if you don't mind I'm going to see if Rebecca has any questions.

WRIGHT: I just have one for you. You gave us a really good synopsis of lots of stuff that you did. Was there a mission or an experience during your last 20 years that really stands out?

Working maybe with specific pilots, or one of the trips that you took, something else that's kind of a—

SOKOLIK: A grabber?

WRIGHT: Yes. Something that just, it happened and you can't imagine it happening again?

SOKOLIK: To be honest with you, no.

WRIGHT: Then let me ask you about when those planes go off, when they launch, and what that experience is knowing that you help that pilot get to where it's going, and that plane's off to do what it needs to do. How does that make you feel?

SOKOLIK: The ER-2, its nickname is the Dragon Lady. It has a very distinctive sound when it takes off, and when the airplane cranks the engines and starts going down the runway, and that thing starts throwing out its little throaty roar, shall we say, it's a sound that for a lack of a better word, it gets in your blood. There's nothing better than the sound of that airplane getting airborne. The sound literally goes through you, and there's no other sound in the world like it, just listening to an airplane take off. You know that's the culmination of all the work that everybody's put in for the mission to get airborne.

But just the sound of the airplane taking off, the visual of it taking off, and of course the pilots are really proud of their takeoffs. The airplane's got a big wingspan, it gets up in the air really quick, and it don't go straight up like a fighter does because of the wings and everything,

but the takeoffs are impressive. The pilots like to put on a show for the ground troops, and it's quite a visual to watch if you've never seen one.

But to me, it's more the sound and the sight and the feeling you get watching takeoff. You know he's going to go up and he's going to do something. He's going to collect some data or he's going to take some photos or do a mapping run or something that, who knows, might help somebody, or maybe he's just going to go up and fly around the flagpole for practice. It doesn't matter. He's airborne, and you've done what you need to do, and you just wait for the next day and do it all over again.

WRIGHT: That's a grabber to me. Thanks.

JOHNSON: Is there anything we haven't talked about that you'd like to mention?

SOKOLIK: I don't know. Let me think on that a second. You can talk while I'm trying to think. The silence is deafening.

I've worked with a lot of pilots over the years on the U-2 Program, the SR-71 Program. I didn't work a lot with the SR-71. I worked mostly with the U-2s, mainly because I like the airframe a lot better. The SR-71 had a lot more popularity, it was a lot more high profile, but I just gravitated toward the U-2 side of the house. I worked on the SRs when I needed to, when they needed help, because I was dual qualified. But the [SR-71] pilots, you're flying an airplane that's going Mach 3 [3 times the speed of sound], whatever, and they were a lot more quiet and reserved on launch days.

I'd be a little bit concerned too. I won't say they were nervous. They weren't nervous, they were just a little uptight. So you kind of treated them that way. You didn't engage in conversation unless they did. U-2 pilots, they walk in and they walk up to you and slap you on the shoulder and say, "Hey, how you doing this morning?" Because it's a whole different airplane. So I found that the U-2 pilots as a whole, for me personally, were a lot more casual, more kicked back, more like me than them. Of course there were exceptions to the rule on both sides. But if I was flying an SR, I think I would be a little quiet too.

Now, I did have one instance when we moved down to Dryden from Ames back in '97, '98, and NASA was flying their SR-71 still. They were doing some final tests on it. I was part of the launch crew. Because I had come down, I was still fully certified, and the rest of the crew I was working with weren't fully certified yet, so I wasn't so much in charge of the crew as I was just basically looking over everybody's shoulder just to make sure that everything was going right. You ever seen a SR-71 fly?

JOHNSON: No.

SOKOLIK: Okay, well, the things have very long takeoff roll, and they're on full afterburner, and if you're within 50 or 60 yards of the runway when it rolls off, the sound just literally vibrates through you with those massive engines on that thing. This is another of those stories that's vivid in your mind. The SR, it started engines and it went down, and it taxied off to our left, to the very edge of the runway, turned around. They had an F-18 up as a chase airplane, and it was circling around in a pattern. The SR ran up its engines and it kicked in afterburners, and of course the sound is immense, and the flame's coming out the rear of the airplane. We watched

that thing coming from left to right, right past us, and everybody's just marveling in the sound and the vibration. The power in this aircraft is amazing.

The thing gets about a quarter mile down the runway, about halfway down, and the sound is just starting to diminish. This throaty roar is down to a light bellow now, and everybody's going, "Wow, wow, wow," and about that time that chase F-18 comes right over our head on full burners trying to catch up to it, and everybody on that ground crew about came out of their skin. Because we were so fixated on the SR, that 18 came around behind us, kicked in his burner, and he's probably about 200 feet over our head, maybe 300, I don't know. And he's just going like crazy and he just scared the (pause) right out of everybody.

That's a story. You had to be there. That was pretty neat. But just to watch the thing fly was amazing. It took a lot of work to get airborne compared to the U-2. But I'd still prefer the U-2 over the SR anyway. Just the style and grace of the airplane. Just amazing.

JOHNSON: I read that you've—well, this was I think in 2006, worked on over a thousand launches?

SOKOLIK: A lot of those go back. With NASA, they have more of a combined effort where you have a couple of people that'll share the work and do the work. A lot of those that I did in the contractor environment were more of a solo environment, which made it a lot more at least important to me, where you did most of the work, and you worked with the pilot as your second person, basically, when you did the hookup. The environment now is you actually have a second person goes and verifies your hookup. "Okay, that works."

In the old days, I would do the hookup, and then I would read a checklist off to the pilot who was sitting in the cockpit, and he would verify the hookup with me, which means there was a lot more work for myself compared to now. From a safety aspect, I think they're relatively the same. But having that number of launches and knowing you did most of it all by yourself, that was a lot of work. It was a big milestone for me.

I have no idea how many I had in military. I probably had as many in the military in five years as I've had with NASA in eighteen, but again in the military I was part of a larger collective where you would do one small part. You might preflight the suits, or somebody else would preflight the suits and you would go out and you would hook the pilot in, then somebody else would recover the airplane after the fact. You had one little part of the big puzzle, where with NASA you go start to finish.

It's better that way, because it's the same person that preflights the suit, that launches the suit, that recovers the airplane, that inspects the suit after the fact. You have knowledge of that suit, and even though we have some very good test equipment that will measure pressure changes and pressure rates with the suit, it still comes down to the technician. The technician has a feel of the equipment, and that's the nice thing you get in a position like where I'm at now, where one person is doing start to finish. I've had a lot of suits, and it's not just me. It's anybody in my career field that works with the suits. You're working with a piece of equipment, and all your tests are right, everything's looking good, but the suit don't feel right. You say, "Okay, everything's good, the tests are all fine. The suit just doesn't feel right to me." So you go ahead and you start troubleshooting it, and most times when you have that feeling, you find a problem. It's underlying, it's there, it just hasn't developed into a big problem yet.

But a lot of the job is about feel, and if you're comfortable with a piece of equipment. Because I always say I won't put somebody else in a piece of equipment that I wouldn't fly myself, mainly because I've been in that chamber. I've seen the effects. I know what happens. So you can literally put yourself in their position. I'd like to think that a lot of the basis of what I've done over the years has not been by what the book tells me what is good and what isn't. It's by, "Do I have the good feeling about this suit?" That's really the underlying thing that keeps me going as far as the job, is how I feel about something. Anyway, I'm getting mushy again.

JOHNSON: We appreciate you spending time with us today and taking time away from the Folklife Festival, and I hope you enjoy the rest of your two weeks here.

[End of interview]