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ANNA L. FISHER
INTERVIEWED BY JENNIFER ROSS-NAZZAL
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ROSS-NAZZAL: Today is May 3, 2011. This oral history with Dr. Anna Fisher is being conducted for the Johnson Space Center Oral History Project in Houston, Texas. Jennifer Ross-Nazzal is the interviewer, assisted by Sandra Johnson.

Thanks again for taking time out of your schedule today.

FISHER: No problem. Thanks for pushing it up a little bit.

ROSS-NAZZAL: Oh, it's our pleasure. We're just happy you're willing to come in and talk to us.

Last time, we talked about your flight, STS-51A, and one of the things we didn't cover was the fact that you were the first mother in space, and that seemed to be a big deal, at least for the news media. What did you think about all that coverage and the interest in being that first mother in space?

FISHER: Well, the whole evolution of everything was kind of a very busy time, because here I was, a new mother. Did we talk about that last time, that I was a new mother and I was training for my flight and was a CapCom [Capsule Communicator]? I think we talked about that last time.

ROSS-NAZZAL: Yes, we talked about those things.

FISHER: That was a very, very busy year. I didn't really expect people to be all that interested, but I guess they're always looking for something novel with each Shuttle flight, so I guess that was it. I guess what I found the most interesting was after I got back. There's an organization in New York City [New York] that gives out Mother of the Year Awards, and I received it that following year after I flew. I guess Susan Lucci was in that group, and there was a governor of Kentucky who was a lady. I don't remember her name. I just thought it was funny that I got an award for being Mother of the Year when I was really, really busy, and then when I took a seven-year leave of absence, I didn't get it so I found that always kind of ironic. It was neat. My daughter, who just got married on April second, she always tells me I owe it all to her.

ROSS-NAZZAL: Isn't that nice of her? That's too funny.

FISHER: So it was interesting, but I guess the strangest question I was asked was either at my preflight press conference or I think we actually had a press conference in flight, and one European reporter asked me how being the operator of an arm made me a better mother. I thought that was kind of a weird question.

ROSS-NAZZAL: I think I read you're the Astromom at that point.

FISHER: Yes.

ROSS-NAZZAL: So, tell us about the next mission you were assigned to, which I think was supposed to be commanded by Mike [Michael L.] Coats, STS-61H.

FISHER: I wound up being assigned to that flight right after I got back from my flight, and we would have been the flight right after *Challenger* [STS-51L]. So, initially, right after *Challenger*, in order to keep the flight control teams proficient, we were supporting a lot of sims [simulations] just to keep everybody proficient after the shock of *Challenger*. But then it was not certain how long that downtime was going to be, so my husband and I decided we wanted to have our second child, and so I decided to do that. They were kind of mutually exclusive at the time.

Also I found out that having two children was way more work than just one, and I just really wanted to enjoy some time with the girls, too, because I knew that there were a lot of people waiting in line to fly on the Shuttle, but there weren't a lot of people waiting in line to be the mother for Kristin and Kara. I wanted to just enjoy it so I decided to take some time off. I think as I mentioned last time, it wasn't a conscious effort to say, "I'm going to take X amount of years off." It was just a year at a time.

My oldest daughter, Kristin, was in school and getting into a lot of activities. Plus, we started her in a private school in Houston, so I was involved with all the logistics of getting her back and forth. We just made the decision for our family that that's what we were going to do for the next couple of years. I really don't regret that. That time wouldn't come back to me.

ROSS-NAZZAL: Do you think it had any sort of impact on your career here at JSC, taking that time?

FISHER: Oh, I think it definitely did. I definitely would have probably flown at least one more time. When I first came back in '96, it was like coming back to a totally different office. When I left, you did business by having meetings. You would send out a memo if you were trying to put out an official crew position on whatever issue, and nobody had computers. I think one person, Steve [Steven A.] Hawley, had a computer. When I came back, everybody had a computer; everybody was on e-mail. The way the office worked was just totally different. Pretty much everybody that I worked with, there were a couple exceptions, but for the most part the bulk of the people I worked with were gone. So it took about a year or so to really get back into the office.

But the one thing I learned, again, I don't remember if I mentioned it when we spoke last time, but by the time I came back, there were very few people left in the office that remembered the beginning of the Shuttle Program, and we were just getting really at the beginning of the Space Station Program at that point. I think I was able to provide an insight that they might not otherwise have had. Here we are now in the nineties, and the Shuttle was flying; it was a very proficient and experienced team. Our products, our procedures were all very good, but it wasn't like that at the beginning of the Shuttle Program. I think the expectations, particularly of some of the earlier Expedition crews, were a little unrealistic. I think I was able to provide a perspective to try to get products that were good, but to also make the other folks in the Astronaut Office realize that the Shuttle was just like this at the beginning. The simulators at the beginning didn't work, and I can't tell you the number of times I'd go over for an SMS [Shuttle Mission Simulator] session and it would crash and you'd go back to your office until they fixed it. That hardly ever happens now.

I remember when we worked on our procedures for ascent, orbit, and entry. There were three different teams, and you could have almost an identical procedure for ascent, which is almost the exact same procedure for entry, and they would look totally different because different people wrote them. During the downtime for *Challenger*, that was one of the things we did; we went through the entire Shuttle flight data file [FDF] and tried to make it consistent. So, in a way, that downtime was valuable because I think later crews really benefited from that. The expectation at the beginning of Station was, I think, very unrealistic, and so I think I was able to provide a unique perspective.

The other thing that happened at the beginning of Station—because everybody wanted to work on Shuttle, all the new people that were hired were put on working Station, rather than the experienced people. So then it was kind of like a double hit. Not only were you working a new program, which is always difficult, but it was also an international program and we were trying to work with our Russian colleagues as well as the other international partners.

ROSS-NAZZAL: You had mentioned something that brought up a question that I had thought of earlier. How has the office changed since you came in in ’78? I understand it was basically a test pilots’ office at that point. Now we have our first female astronaut chief, [Peggy A. Whitson], and she’s a scientist. So can you explain how it’s changed?

FISHER: Oh, yes, it has changed dramatically in some respects. A lot more rules.

ROSS-NAZZAL: Oh, really? Can you explain that?

FISHER: When I first came here, you were expected to use good judgment. There weren't rules for every little thing you did, particularly T-38 flying. More than that, though, just across the board. Either people didn't use good judgment, which resulted in the rules, but there's just a lot more regulations, I think, now and things are spelled out a lot more clearly.

The people that I first came into the office with were Vietnam pilots who had also been to test pilot school. They also weren't used to working with women as colleagues. They were used to women in a support role, either as their wives or maybe as secretaries. But the new class of men have grown up with women and are used to women being their colleagues. So that's a difference.

Definitely with the Shuttle flying, it would be more difficult to have a chief of the office who wasn't a pilot, just because so many of the decisions that the chief of the office has to make required you to be a pilot, and a lot of their things that they do, like being the weather pilot at KSC [Kennedy Space Center, Florida]. They usually tried very hard to have a mission specialist be the deputy chief so that both views got represented. I think that's pretty consistent over the entire program. When I first got here it was pretty much all pilots for both the chief and the deputy, but starting probably after *Challenger* that changed. That's been pretty consistent that there'd be a pilot who was the chief and a mission specialist who was a deputy.

Of course, now with Station, it's really the Station experience. Particularly those who've launched on a Soyuz, since that's pretty much all that we're launching on now. So somebody with that kind of experience is in a better position to make the critical decisions that need to be made at that level. The needs in that position changed, which allowed a mission specialist to actually be the head of the office, but it does create a different feel to the office, particularly with the director of FCOD [Flight Crew Operations Directorate] being Janet [L.] Kavandi, a

woman. Some of the folks in my office were joking about how women are taking over the world.

ROSS-NAZZAL: Well, that's true, isn't it?

FISHER: I remember Judy [Judith A.] Resnik came up with these bright pink bumper stickers that we had made that said, "A Woman's Place is in the Cockpit," but we wouldn't need those anymore, I don't think.

ROSS-NAZZAL: Now that you have women in the cockpit.

I did want to ask you to talk a little bit about Judy Resnik. I know that you had mentioned you were friends before you came to the office.

FISHER: Well, we didn't really know each other. She was in the interview group with my husband, who didn't get selected on that go-around in, I guess, about November. So I actually knew her then through him. Then as it got closer to the announcement, both of us were getting calls from reporters, so we started to realize that something was probably up. And I think the night before when we were expecting the announcement to be issued, we went out to dinner together. The night, when the announcement was made, Bill took us both out to dinner too. Then we've just been friends over the years. It was neat sharing that night before and that night after with her.

ROSS-NAZZAL: She's seems to be a very special person. When people talk about her, a lot of people say she was their best friend, so she obviously had a lot of friends in the office.

FISHER: Yes, she was great. I was actually good friends with her half-sister, who was an interior decorator who helped me get some stuff for my house and went shopping with me up in Dallas [Texas], so I was really good friends with her, her half-sister.

ROSS-NAZZAL: I wanted to ask you about an incident that I read about in the newspaper. I was just curious about your insight. There was an interview done with Judy, and basically the headline was something like "Women's Lib Didn't Get Astronaut Where She Was." Basically someone had asked her did she think that the feminist or women's liberation movements led to her selection, and she said she thought it was her experiences. So I was curious, from your perspective as a female astronaut, do you think it was your experience or a combination of both?

FISHER: I think Judy was probably focusing more on the fact that she wasn't selected as a woman but because of her credentials. I think it would be naïve to say that we didn't benefit from the feminist movement and from women who went before us pushing hard for equal rights.

I just saw a very dramatic difference just in the four classes at UCLA [University of California, Los Angeles] when I was in medical school. When I was a freshman in medical school, the senior class had three or four women. The next class had maybe eight-ish, six to eight. The next class had around ten-ish, and my class had fifteen or sixteen. So just in that four-year period, and I started in '72, so that other class would have started in like '68 or '69, something like that. That was a pretty dramatic difference, I thought, because there really

weren't that many women in medicine at the time. Now I think the classes are pretty much 50-50 so I definitely am grateful to the women who went before us.

I do think NASA made a commitment with the '78 class to select women, so I feel that I definitely had the credentials to be selected, but I feel that being a woman maybe helped a little bit as well in this one case. Whereas many years before being a woman didn't help you at all. I feel that NASA had made that commitment, and someone with my background, I think that helped, and I'm really grateful to the women who went before us.

ROSS-NAZZAL: That's an amazing class, what you've all done.

I did want to ask about the *Challenger* accident. Where were you when the accident happened?

FISHER: Oh, I know exactly where I was. Jim [James F.] Buchli and I, like I said, that was the time that we were at a robotics training session in the SMS. We were up on the flight deck, and I kept asking, "Is the launch still on?" because we'd been listening to the weather. I didn't get the impression that our training team or anybody was going to stop, because I kept saying, "Are they going to launch yet? Are they going to launch?"

When they came out of the ten-minute hold at nine minutes, I asked them to freeze the sim, and we went down to the conference room to watch it. We were watching it on TV. As soon as it happened, Jim and I looked at each other and said, "We're going to cancel," because we knew immediately what the outcome was. So that's what I was doing. We ran over to the office, and we all tried to find ways to help. I remember that evening we all went out to

Ellington [Field, Texas], and we were waiting for the families to come back, to show our support.

ROSS-NAZZAL: Did you spend much time with any of the families after the accident?

FISHER: We have a casualty assistant officer assigned to each person, so that person spent the most time with them. Mike [Michael J.] Smith's family, for example, was a really good friend. We used to water ski together. We both lived on the water. I was really good friends with Dick [Francis R.] Scobee and with Judy, of course. As all the memorials went on, we spent time with their families.

ROSS-NAZZAL: Did you play any role in the investigation or the recovery of *Challenger* itself?

FISHER: No, because I was still assigned to the crew at that point, so we were trying to keep all the flight controllers proficient in everything. We were the most proficient crew at that point so we spent a lot of our time doing that. Then I was our lead for the flight data file, and, like I said, we had a massive effort to redo all the checklists, review them, make sure they were consistent. So that's what I was doing post-*Challenger*.

ROSS-NAZZAL: I also read on your biosheet that you started working some Space Station issues. Can you talk about that a little bit?

FISHER: We decided to have Kara, and they decided to abolish the crews. They put the [STS]-26 crew in as the Return to Flight with Rick [Frederick H.] Hauck, who was the commander of my flight. All that got shuffled, and we decided to have Kara.

So then I think I was on leave for about a year and a half, and I came back and worked part-time, and that's when I started working some Station things. When I came back and they asked me to work some of the training issues, the first thing I found out was that the international agreements were such that each partner country was going to have training in their country. My initial thought was you put all the simulators here and do all the training here. So then I looked and they said, "Well, you know, that's not something that we're going to be able to change. That's part of the international agreements."

I remember my first comment was, "Well, then you better hire a bunch of divorce attorneys and put them up in the front office, because this is going to be a nightmare for people training." That was way back. Kara was born in '89, so it would have been '91. All the complaints we're hearing now about how bad the traveling is, I knew that right away, but there was no way to really change that because each country wanted to have its part. I understood that. They wanted to show people in their country that they're putting money towards the International Space Station, that astronauts were coming there too. You just knew right from the beginning that that was going to be a big issue.

I came back and started doing that, but at the time it was still Space Station Freedom. We had not yet entered into the agreements with the Russians. I think it was just the other international partners at the time so it just didn't seem real. I was really enjoying my time home with the girls. I just said, "If I'm going to come back and work on something, I want it to be real and it's going to happen." Because it felt like—and I know a lot of people felt that way:

"Design this. Okay, now take some money away, and let's see what you can do; let's redesign it now." It just felt like it was going to be an endless study, and I didn't feel like that was worth being away from my girls for. I went back onto leave of absence and then, like I said, came back in '96.

So that took about a year, like I said, to kind of get back in the swing of things, and around that time, of course, the '96 class was selected. Mike [Edward Michael] Fincke, Dan [Daniel C.] Burbank, Peggy [Whitson] was in the '96 class. I was kind of the deputy—at the time it wasn't the Space Station Branch—but we just had a technical assistant to the chief who followed that, and it was Tammy [Tamara E.] Jernigan. I think Ellen Ochoa did that and Tom [Thomas D.] Jones. And then I was around enough to where it was obvious it was heading my way. For a while, I didn't want to. I wanted it to stay more Shuttle focused. Then I finally saw that this new class was coming in, and, like I said, there weren't the people around who remembered what the early days of the Shuttle were like, so I finally gave in. They made me chief of the Space Station Branch.

While that was still evolving, I still remember Dan and Mike, and I don't know if Peggy was there or Sandy [Sandra H.] Magnus, and I looked at them and said, "You know, in case you haven't looked at the manifest, all the flights in the outgoing years are building the Space Station. If Space Station doesn't work, you guys are going to be out of a job so I suggest you work on this and take it very seriously," and I never had to say another word. At that point we had made the agreement with the Russians.

Has somebody talked to you about the Cape Crusaders, as we call them, the people who work at the Cape [Canaveral, Florida]? I came up with the idea that we needed something equivalent in Russia. We'll create the Russian Crusaders. Of course, there's no real formal way

to do that. You use what I call blue-suit diplomacy, you know, go over there, make friends. I just said, "Get in over there however you can and start learning about their hardware. Let's help them with the procedures."

Originally all the procedures were going to be in English. Poor Dick [Richard C.] Snyder, who's the head of the ODFCB (the Operations Data File Control Board), I remember going to him and saying, "We've got to translate these procedures from Russian to English, because it's not going to happen any other way." He hadn't budgeted for any of that. So we developed a group of folks. Slowly, MOD [Mission Operations Directorate] started sending people over there as well, as that began to develop. In the earliest stages of that, we were just kind of creating that all as it went.

ROSS-NAZZAL: That's interesting. I like that, that term "blue-suit diplomacy."

FISHER: Yes. The other one I'll say with my girls or if I'm doing something, I'll say, "Let's use some Shuttle diplomacy here."

ROSS-NAZZAL: That's too funny.

Have you been to Russia yourself?

FISHER: Yes. In fact, I went for ten days for a TIM (Technical Interchange Meeting) that they used to have, but way before Expedition 1. Mike Fincke had trained in Russia and was pretty proficient at Russian, and he was, like I said, in the branch. I remember he'd be at meetings and he would whisper in my ear, "Okay, you're supposed to do a toast now," or something like that,

because Mike is so into etiquette and customs in other countries. I became really good friends with the people that were on that ODF [Operational Data File] Control Board. In fact, I'm still really good friends with Tatiana Matveeva, who's a flight controller over in Russia, and stay in touch with those folks because it was pretty interesting.

I said of those early days that I was ready to go negotiate nuclear arm agreements after learning to negotiate with the Russians about making our displays the same, making our procedures the same. At the time, our office procedure was it's going to be one station; English is going to be the language. Obviously, we were not even successful in our attempts, but we had noble goals back then to keep the Station from being segmented. Unfortunately, it has evolved that way into pretty much segmented ops right now, although, again, talking with Dan the other day, I think some of the folks who did that early work with the Russians have some ideas of how to try to maybe turn that around a little bit.

ROSS-NAZZAL: Would you tell us a little bit about negotiating with the Russians?

FISHER: Oh, I was kind of joking. We would have these ODF Control Board meetings where Tatiana, love her to death, but, oh, my god, was she a difficult negotiator. I mean, you would argue over does a period mean, "and," or the meanings of the symbols in the procedures. Then they actually had a lady who was the head of all the development of their displays. I've forgotten her name now, but they called her the "Dragon Lady." She had all these young programmers who were computer savvy working for her. Getting her to agree, and our other international partners, that our displays had to have a common look and feel was difficult. The way the international high-level agreements were written for Space Station, and still are, is that

each partner could do whatever they wanted in their own module. That would be like when you were in Europe and every time you crossed a border, the money changed, everything changed. That would have been a nightmare on the Station.

We had to convince them that the right thing to do was to make the displays look the same and to make our procedures look the same. It wasn't 100 percent easy with the Europeans and the Japanese, but it was really hard with the Russians. The only way I learned that we were able to make progress is by becoming friends. Like when they were in town in Houston, I had them over for dinners and things like that, and as we became friends and partners, then it was much easier for them to agree.

I came to really admire them. When I'd go over to visit, at some points there, some of their flight controllers were not being paid. They were working two and three jobs to make enough money to support their families, and they continued to work in Mission Control without being paid sometimes. You began to realize they believed in space just as much as we do, and I came to respect some of their ways of doing business. I think we formed a nice team and blended.

If I look back, actually, on my career, I would have to say, for me, that was probably the most personally rewarding time. I love my flight, that was wonderful, but I think my major contributions to the program were probably during that time.

ROSS-NAZZAL: Do you think that animosity was because of the Cold War, or were there other reasons behind their mistrust of Americans initially?

FISHER: I think it's just the way their whole society was back then. One of the things that was job security was if you knew a certain area, and you didn't tell anyone else. Nobody could get rid of you. No, really, I'm not joking. I really think that was part of their mentality, so each little area in training and in procedures had their area of expertise, and they did not like to share it with someone else.

Also early on, the Russians had far fewer people than we did to work that program, so I think early on they kind of did a little bit of what we did. Like at the beginning of Space Station, we assigned all of our new people. They wouldn't send necessarily the correct person over to our meetings. I found out later that Tatiana, she really wasn't working procedures. She was really a flight controller, but somehow they just picked her probably for her negotiating skills.

And then definitely the Cold War atmosphere, some of the pilots that I came in with just thought we were absolutely out of our minds to be partners. I'll have to be honest, when I first came back, I thought we had lost our minds too. I came to totally reverse that opinion, but when I first heard that we were going to be partners with the Russians, I was shocked. In retrospect, it was a very good decision.

The thing that I feel badly about is when they had that big discussion about the two- or three-billion-dollar overrun for the Space Station and a lot of people lost their jobs, I feel that that was very unfair. The decision to become partners with the Russians was made at a much higher level. That wasn't something made at JSC, it was made as an international agreement. Their rationale was because the Russians already had experience it was going to be cheaper. Well, you don't have to be too smart to know that it might have been a good move to do that. But that it was going to be cheaper? Just in the one area that I mentioned, we wound up having to translate all the procedures from Russian into English, and we had to pay for it. So to think

that this was going to make the Space Station cheaper was a very naïve assumption, but I think it was that two or three billion or whatever it was they say, that overrun, that money was so well spent. Would you rather be building nuclear weapons to defend yourself, or would you rather be making friends and becoming partners with them? So I feel very badly for some of the people who were criticized, some of the early Station Program people, George [W.S.] Abbey, who was the Center Director at the time. I think they took a lot of criticism that was not warranted, because I think we really got our money's worth, looking at it from a much bigger, broader perspective.

One of my favorite memories of that whole time was on one of my trips to Russia. It was in September, and I met my friend Tatiana for dinner and a glass of wine in a little restaurant on Red Square. I was sitting there with her, having a glass of wine and eating. There was a full Moon, and right in the background was the Kremlin and all that stuff that I remembered seeing on TV, on—I guess it was May Day, when you used to see all their soldiers marching and tanks. I don't know if you remember all that, but I certainly grew up with that Cold War mentality. I just said, "I just cannot believe I'm sitting here at this very same place where all those tanks would roll by, and now we're partners." And in such a short period of time.

I think the Space Station—when people ask about the science, which I think is wonderful—people got more than their money's worth. I feel that there may be a lesson to be learned there for the rest of the world, particularly in regards to the Middle East, China, and North Korea. You know, when you work together on these big projects and you start getting people working together one on one and not as this nation with that nation, and you start to have a common goal, a lot of those differences go away. I think that we should perhaps learn from that and use it in other areas.

ROSS-NAZZAL: That's a good summary. You had mentioned that there are segmented ops on Space Station. Can you talk about that a little bit?

FISHER: Yes. It's pretty much, as I understand it, and I'm training right now to be an ISS [International Space Station] CapCom, so I'll probably become a lot more familiar with it as time goes by, but it sounds pretty much as though the Russians are operating their segment and the U.S. is operating our segment. Of course, there is some cross-training, but because the training flows were so long—I mean, the training was just a killer for people. First you were on a backup crew, then you became prime crew and you were basically traveling back and forth between Russia and the U.S. Then as we added other partners, the Japanese and the Europeans, the training was just brutal, and people weren't willing to do more than one flow.

I think it was Piers [J.] Sellers and a couple other folks tried to come up with what we call single flow to launch now. You no longer have dedicated backup crews, so you don't have to do a backup flow. Then you just take whatever the next crew is going to back up the flight ahead of it if anything occurs. It took a long time for them to negotiate that with the Russians, because the Russian mentality of dedicated backup crews was well ingrained. I'm not quite sure how Piers and all were able to negotiate that. I'm sure it took a lot of talking. So now we have that single flow to launch. It's implemented, and that has reduced the training time. What it's also done is there's only X amount of time, so pretty much the U.S. is focusing on the U.S. side, and the Russians on the Russian side at the specialist level.

[William Shepherd] Shep and those guys for Expedition 1, Expedition 2, they felt like they needed to know everything about everything, and as the Station got bigger and bigger, and

as I can tell you from just being in the ISS CapCom flow, there's just too much information. There's no way you could know everything about every system in every module and ever finish training. You would be training for the rest of your life. They had to come up with some way to get their hands around that, and one of the things they did is they came up with this user, operator, specialist. So every crew, certain people are designated specialists in certain systems and maybe just a user of a particular system. A user is just someone who knows a little bit about it, an operator is someone who can do nominal procedures, and then the specialist is the one that can do the malfunction procedures if there's a problem. So that's one way they tried to reduce the training.

Also you don't have many cosmonauts that are specialists on U.S. system, and you don't have many U.S. astronauts that are specialists on Russian systems. To the extent that I think there's some concern that the commander is not necessarily as knowledgeable about everything that they need to be, they want to actually try to beef up that kind of training on the others. If you have a U.S. commander, there's certain things you need to know about the Russian side for an emergency, and vice versa when there's a Russian commander.

It has evolved into much more segmented ops than we naively initially wanted. We initially would think that you would have a crew and the commander would decide who's going to be doing what. And that's the other thing. If you want the cosmonauts to do training on a U.S. segment, then you have to negotiate that with them. A commander can't just decide, "I want Cosmonaut A to be a specialist on the U.S. ECLSS [Environmental Control and Life Support] system." That all has to be negotiated. So that's very different than in a Shuttle flight. A commander decided how he was going to allocate his crew and then would go discuss it with the chief of the office and make sure they were in agreement.

ROSS-NAZZAL: Kind of makes things pretty cumbersome.

FISHER: But it's a good learning process now, because if we are going to do international missions to the Moon or to Mars, these kind of issues are going to have to be worked out. A commander will have to be a commander in the true sense. You would not be able to go to Mars and having an international crew without having the Japanese, the Russians, and the Europeans negotiating what their crew members going to do. A commander needs to be able to look at the people he has and the skills they have and distribute them appropriately. I think we're probably going through this kind of a learning process right now as to how we would do something like that. So it's all good. It's going to take a while to work our way through that, I think.

ROSS-NAZZAL: What role did you play in the first couple of Expedition missions?

FISHER: I was still chief of the branch. We were switching to electronic procedures at the time, although the Russians didn't want to do that, nor did the early flight directors. So we wound up flying books for the first two Expeditions, which was kind of funny because I knew that was going to happen, but everybody kept trying to insist we would be electronic, which we were eventually forced to do because there's just, like I said, too much. There's no way you could fly paper procedures for everything for ISS.

So I was involved in how we were going to organize all of that, what we were going to call each system, because we were trying to operate as one station, so we were trying to come up with a Station-wide nomenclature, like CDH for command and data handling, and then have

under that the U.S. procedures and the Russian procedures. We tried to force, by the way we organized our procedures and our displays, to make it a one Station across. So those were the kind of things. And, of course, at one point there, our Space Station Branch probably had forty to fifty people, astronauts and contractors, that I was supervising. At one point, we actually had two deputies and me, because there was just so much work to do.

ROSS-NAZZAL: That must be very different for you, having your medical school background and then becoming a manager.

FISHER: Oh, it was, it was, but that's one of the things that's neat about the office. One of the things I really respected is the difference between the mission specialists who came from an academic background and the military. The military, I have to say, does a superb job of raising leaders, because I remember when I was chief of the Space Station Branch, Jeff [Jeffrey S.] Ashby was one of my deputies, and Scott [E.] Parazynski was the other. Scott comes from a similar background to me as a medical doctor, and he was at the time working EVA [Extravehicular Activity] issues—because we were looking ahead and seeing all this EVA work for building the Station. This was before we'd actually even done the first one. It became real apparent that we didn't have people with the skills to do that in the office. Scott was very busy developing a skills program to put all the astronauts through to get more people with EVA experience before we hit what was called this "wall of EVA" that was headed to us.

Jeff Ashby, on the other hand, came from the military, and he was helping work all the technical issues but he also kept reminding me about doing good performance reviews of people, nominating people for various awards that we can. I wasn't trained to be a manager. In our

office, they just put you in places. Having watched a bunch of my military colleagues with their leadership skills and watching Rick Hauck, who was my commander, they just have a certain way of being a leader. I just tried to imitate them. It was very different being in that position. Like I said, I really didn't want to. At first, I felt very uncomfortable. I didn't think I had the skills, but then what often happens in our office is they put you in a position and you develop the skills rapidly.

ROSS-NAZZAL: You had mentioned that you're training to become an ISS CapCom. How is that different from being a Shuttle CapCom?

FISHER: I'm just going to give you one example real fast before I forget, and then I'll answer that question. I can still remember when Barbara [R.] Morgan came back and was actually a full-fledged astronaut—I guess it's okay if I talk about people's names.

ROSS-NAZZAL: Oh, yes, that's fine.

FISHER: She came back and was made a full-fledged astronaut. When everybody received their technical assignments, she was assigned to my branch. I'm sitting here thinking, "Okay, now what?" Not that I had to worry, because Barbara went on to do an absolutely astounding job as a mission specialist, but when we she was first sent down to the branch, I'm going, "What am I going to do?" At that point we were starting to realize we had a big issue with stowage and trash management, so I said that's what we'll do.

I was sitting there trying to figure out the right jobs for people with their skill sets with where they were in their careers and everything like that. That was also really new to me, figuring out how to manage people and take advantage of their skills and help them with their own personal development.

So, anyway, the difference between—did you say Shuttle CapCom and an ISS CapCom?

ROSS-NAZZAL: Yes.

FISHER: When I was a CapCom it was for STS-9 and it was a very, very different environment. We had all paper procedures, and everything was done by documenting and paper. I'm just in the middle of my flow for ISS training, so I haven't actually started working on console yet. I'll probably start doing that in about the July time frame. But just from my exposure to what I've seen, it's just a totally different environment, both in the Shuttle and in Station, because everything is so electronic now. Everything's available electronically, and you can be in Mission Control and have your laptop there and be doing e-mail and work. When I was a CapCom you were in Mission Control, and there was no way other than by the phone to communicate with other people or do anything about your office job. You were just there. That's a pretty big difference, actually, because—just like in everything—you can pretty much stay connected no matter what you're doing.

The difference in a Shuttle CapCom and an ISS CapCom is a Shuttle mission is just like a sprint, and ISS, as a CapCom, as a crew, is more like a marathon. When you're working a Shuttle mission, everything has to be done rapidly. The biggest difference is you're manned around the clock. You're there your one week or two weeks, and then that flight is over.

So what I've seen on the ISS side so far is it's a much slower process. If the crew asks a question, you might not have the right person there to get an answer right away. The habitability aspects, the stowage aspects, keeping track of where things are, just the sheer amount of knowledge you have to have about the systems, the CapCom flow for ISS systems just scratches the surface just so you'll be familiar with the vocabulary and generally how the Station is organized. There's just so much to know. At the same time, other than, I guess, on certain days, like docking days, undocking days, when a Progress is coming or a Soyuz, other than that, it's a slower pace, I would imagine. That's just kind of my guess, as opposed to when you're in the Shuttle environment.

ROSS-NAZZAL: Will you be doing sims before you start?

FISHER: Oh, yes, definitely. Probably start doing those, I guess, in August. I think in July I'll start sitting with someone else. It's just real interesting, that process. When I was a CapCom for STS-9, you just went over there and you sat with another astronaut who was there before you, and when they thought you were ready, you were ready. There was no training flow. Being a CapCom was training. That was because you didn't get in a flow until you were a crew. So getting to be a CapCom or working at SAIL [Shuttle Avionics Integration Laboratory] or any of those things was your training. Now it's the other way around. Now you have to have all this other training before you can do that. It's just kind of interesting.

ROSS-NAZZAL: Now you don't have to be, I understand, an astronaut to be a CapCom. Is that true?

FISHER: I think we just didn't have enough people to cover everything when we had all the Shuttle flights going and all the ISS crews assigned, and so at some point we picked certain folks from MOD to be CapComs, and they're super. They were very highly qualified people that have been selected to do that job.

ROSS-NAZZAL: And are you working on other projects now?

FISHER: I'm actually doing three things. I am working Shuttle flight data file and training, which obviously is trailing down, and I just didn't figure it was worth giving that to someone else. I know all the people. I've been working with them for years and years, and it doesn't take that much of my time to follow that. For instance, now when the [STS]-134 launch scrubs, I talk to the training manager, say, "Okay, what's your plan? How is this impacting [STS]-135?" And then I let George [D.] Zamka, who's our Shuttle chief, know what the plan is, and flight data file, same thing.

In fact, we're getting ready, I think in June, to have our final CPCB (Crew Procedures Change Board), which I've been on for many years. That's what I was doing before I went on my leave of absence, and then I started doing it when I came back as well. So I feel like I've been doing it all my life. We want to have our last CPCB, and we're going to bring back some of the former people, like Dick Snyder and some of those folks. I think by that time Mike [Michael E.] Fossum will be up on the Space Station; he used to be a flight data file rep also. I'm working that.

Then, as I said, I'm training to be a CapCom, and then I'm also in the Exploration Branch. I'm working a lot of the Orion or what are we calling it now? Multi-Purpose Crew Vehicle (MPCV) displays. In fact, that's why I had to move this up, because we're getting our display ready for Innovation Day tomorrow, and we're trying to decide whether to show the generic cockpit, which we use for commercial crew, or whether to show the Orion cockpit. Some of the managers want to come over and see the two and decide which one we can use, because of proprietary concerns. Lockheed Martin is the contractor for the Orion vehicle, and now we've got the commercial crew, those four contractors. All the stuff they do is very proprietary and you have to be really careful that you don't give away someone's secrets to someone else when you're dealing with them. So they're having some discussion of whether we can show the Orion cockpit or can we show the generic cockpit that we've got that doesn't relate to any specific vehicle. It's really fun working on the displays. I've never done anything like this before, actually programming a little bit, which is unheard of for me.

ROSS-NAZZAL: One of the things that we didn't talk about that I wanted to ask you about was serving on the Astronaut Selection Board. You did that in '87.

FISHER: That was really interesting. Mike [C. Michael] Foale was in the group that we selected that go-around. It was a very interesting process to go through all that, seeing people's résumés on paper, and then to finally selecting the few that you were going to interview. We probably interviewed about 150 or 200 folks. I don't remember exactly how many.

It was just interesting to me to when we finally got to that interview process, how when somebody walked in a room, how often I changed my initial impression by the end of the

interview, and I can only think of maybe one case where my initial impression changed. It was just kind of interesting for me. It taught me a lesson when I'm in a situation where I'm being evaluated. People make up their minds quickly about what they think about you. It was just really interesting to be on that selection board, a real privilege to see how that's done. It's probably a little different now. I know in this last group of folks, they were told that they were picked solely for Station, they weren't going to fly on Shuttle. I really do think you're probably looking for maybe slightly different personality type than perhaps for Shuttle missions.

ROSS-NAZZAL: What kind of people were you looking for?

FISHER: I don't know that we ever discussed it; we mostly discussed technical requirements. You know, the pilots had to have been to test pilot school, and you needed a certain level of education coming in from the mission specialist side. You couldn't just be straight out of college, and you had to have an advanced degree or have certain amount of experience in your field before you even were selected. There's nothing in writing or nothing discussed. You're just looking for a certain kind of person who can be a good leader and be a good follower, because sometimes you're going to be leading in this job, sometimes you're going to be following, and you can't just pick somebody who just always wants to be a leader. They're not going to survive. Then just somebody who's going to work well with all the kinds of people that we have to work with. It's not something that's easy to put into words. You just kind of, after a while, know if somebody's going to fit in well in the office and do a good job or not.

ROSS-NAZZAL: Did race or gender play any sort of role in your decision? Mae [C.] Jemison, for instance, was in that class.

FISHER: Oh that's right. No. I suspect that the higher-up levels, they really wanted to. They had not up until that time accepted a black female, and I know they probably really wanted her, but they wouldn't select someone if we didn't think they were qualified. Given that you had three qualified people or whatever to pick from, that's when they might come into play there.

ROSS-NAZZAL: Did you have any concerns? Mike [Richard M.] Mullane talks about in his book that he was bothered by the fact that NASA selected astronauts when there weren't going to be as many flights after *Challenger*. Were there any concerns on your part selecting astronauts right after the accident?

FISHER: No, because we didn't know what the attrition rate would be with the accident. The other thing is—and most people I don't think realize it—just how much support work the office does and also how long it really takes to be comfortable to be on a Shuttle flight. I think Susan [J.] Helms was probably the only person I can think of who was pretty much selected to a flight straight out of her astronaut candidate flow, which at that time, I think, was about a two-year process, because they had a very different AsCan [Astronaut Candidate] flow. We had no AsCan flow to speak of. They actually went through the 2000-level series of Shuttle courses, which I took as a crew member when I was assigned to a flight. The simulators couldn't support all of my class going through training and all the early Shuttle crews that were training at the same time, because they kept crashing all the time in the early days.

So when they come out of their AsCan flow, they're definitely at a higher level than we were, because they've actually had training in the simulator. What you don't realize and what I realize now looking back, I worked as a Cape Crusader, I worked at SAIL, I was a CapCom, and being a Cape Crusader gave you an opportunity to see how KSC works. All the Centers are very different and have very different personalities. I could have gone into flight probably without that, but I wouldn't have realized just how little I really knew. I mean, you can know Shuttle systems, and all that sort of stuff, but it's way more than that. It's how does the Cape work, how do things get done there, how are the manifesting decisions made, working with the folks in Building 1 and the people who are in charge from the cargo point of view.

I think it certainly takes a couple of years beyond AsCan training to really get an astronaut who is experienced in all that; it probably takes a good minimum three or four years before you're really at a level where you understand how NASA does business, how to get things done, how to handle things in a proper manner and so forth. I was pretty confident we would solve the problem and that the Shuttle would fly again, and you know that it's going to take that many years for somebody to get up to a level to really become a useful crew member.

ROSS-NAZZAL: You had mentioned to us what you thought was your, basically, greatest contribution to the program. What do you think was your biggest challenge since you've been working at NASA?

FISHER: My personal biggest challenge or you mean with the program?

ROSS-NAZZAL: Working at NASA; what do you think was the biggest obstacle or challenge that you had to overcome?

FISHER: I think the hardest thing for me personally—and I don't really see that changing—is just balancing a demanding job with a family and being able to do both. I don't see that even changing for some of the women coming after me. Karen [L.] Nyberg, my hat's off to her. I don't know how she's training for an ISS flight, traveling all around the world as you have to do, learning Russian, and having a new baby. That's a lot on your plate. You need to have a lot of good people in your life to help. So that is the biggest challenge, I think. I think the men in the office, perhaps they didn't face it as much for Shuttle flights because the traveling wasn't as extensive and most of the male astronauts had spouses at home that made sure everything was running smoothly. But when it comes to the demands of ISS training, I think both males and females in the office are feeling the effects of that.

ROSS-NAZZAL: Is there anything that you can pass along to them from your experience?

FISHER: Each person has to make those priorities for themselves. Having someone that you feel confident with to help you with your children. For example, Susie Galvin took care of Kristin while I was training for my flight, up until Kristin started kindergarten. She was at the wedding on April second, and in my talk I said, "Couldn't have done it without you." I mean, literally, I would not have felt comfortable leaving Kristin if I hadn't known that she was with such a wonderful person. I think Kristin actually benefited from having two of us in her life. Each

person has to decide what works for them, and obviously I decided, once I had two children, that I just couldn't split my time in that many directions.

My daughter has just married, I know they're looking at starting a family in the probably not too distant future, and she has a pretty demanding job. She's a reporter, and her job could involve a lot of traveling. I don't even really know what advice to give to her, because it's just a continuing challenge. I do think our technology today does help a lot. Being able to have Skype and video conferences that does allow you to have a demanding job and be able to be there.

We were just talking, you know, the announcement that Paolo [A. Nespoli]'s mother just passed away. I think that's common knowledge, isn't it? He's up on the ISS right now. I'm pretty sure. We got e-mails about it; I think I read about it in the paper. In the past you were totally isolated. I was talking with some of my friends in the office, now you could actually allow someone on ISS to be present for a funeral or memorial with our technology. So that does help a lot, because back in my day, if you went on a trip and you were gone for ten days, like on that trip I made to Russia for ten days, you were gone for ten days. It wasn't even easy to make a phone call because it was so expensive.

And I discovered that when the cat's away, the mice will play, as I was going through some video, because Kristin was really getting on my case for not converting our HI-8 format to digital format, so I was converting these, and I found them doing things at home that they weren't supposed to be doing while I was on that trip.

ROSS-NAZZAL: Good thing you found out about it now, not back then.

FISHER: Yes. So many years have gone by, there isn't any point in getting upset now. But someday I'm going to let them know I saw what they were doing.

ROSS-NAZZAL: I think we've pretty much gone through all my questions, but is there anything that you wanted to add about your class or the Shuttle Program as things start to close out?

FISHER: I just think it's really sad that such a wonderful vehicle is being retired. I attended Dr. [Christopher C.] Kraft's ceremony where they named the Mission Control after him. That was really neat to be there for that. He's one of my heroes, and to listen to Glynn [S.] Lunney and Gene [Eugene F.] Kranz and to hear him speak again, because those were all the people that were in charge when I first started here, so they're my heroes.

To see it end now, it's really sad, because that vehicle is so wonderful. The teams now are so proficient. The Cape folks just know their systems. When I was at the Cape just before [STS]-133, I spoke with this one gentleman. I wish I could remember his name now. He worked on the tiles since STS-1. I mean, he knows that. He started as just a technician out of high school, wound up, through NASA, going back and getting his engineering degree and then came back. That kind of experience is unbelievable, on one hand.

Then on the other hand, like I said, I'm in an office now with a bunch of us that are working Orion. We were talking about how sad it is that the Shuttle's going to retire, but on the other hand a capsule-type vehicle is just a much safer vehicle over the entire range of speeds. There's just a much easier capability to save a crew with that kind of a vehicle. It's not as much fun of a vehicle, but a winged vehicle that lands is always going to be a more fragile vehicle than

a capsule. The Shuttle did what it was supposed to do, build the Space Station, and nobody could do that. But it is sad.

The other thing that's sad is with the ending of the Shuttle Program and the confluence of that with our budget and deficit issues, it's going to be a very hard time for NASA right now. We're probably going to lose a lot of our support engineers. We're already seeing several people that worked in the office that have been there since I've been there, who have been let go and more are being let go. Then when the last Shuttle flight ends, more of our contractor personnel will be let go.

It's going to be a very, very different environment, actually kind of similar to the environment when I first came here. There was a much heavier NASA involvement and less contractor, although, of course, a contractor was building the Shuttle. The training was still NASA, which now is USA [United Space Alliance]. At the Cape, all the processing was NASA and all that. And it slowly evolved. I'm not sure I understand all that and how that happened, but it evolved to much more contractor level. Quite frankly, I never even noticed if somebody's NASA or contractor until now, as we're learning that with all the budget cuts we're going to lose a lot of folks. Although some people would say that we do have a defined program, I still don't feel like we really have a defined program forward. Losing a lot of our very skilled workforce, it's going to be, I think, a very difficult time for NASA over the next couple of years.

I remember when I came here, how exciting it was. It was full of unknowns at that point too. We didn't really know—none of us talked about it, but I'm sure we realized that if the first Shuttle didn't work, what were they going to do with us? So there was that uncertainty, but you had a defined program that you were working towards. It was just a matter of was that program

really going to succeed, and then once it did, from that point forward, it was just the most exciting thing to be a part of.

Definitely we have ISS, and the new astronauts are focused on that, but you can't just have your current program. You have to have a vision forward, and I just think one of the biggest challenges that NASA and other big programs face is that there's no mechanism to make decisions that span congressional elections and presidential elections. There just has to be a better way to make major decisions that are less political.

And I do think NASA—I'll just speak for NASA now—but this is true of other big programs, military programs, particle accelerator kind of programs, all those kind of really big high-budget kind of things, you just can't go ahead creating programs and then destroying them. There needs to be some other mechanism for that sort of thing.

You were asking about challenges, and I think that is definitely one, to figure out a different way to make your forward plans and then not have those be affected by who the new President is or who the next Congress is.

ROSS-NAZZAL: That's a good point. That has been a big challenge for NASA, building the Space Station, for instance, as you pointed out.

FISHER: Well, that came one vote from being cancelled. One vote saved the Station. And that's pretty scary. You shouldn't have one vote saving a major project like that. And I personally feel that the only thing that saved it was the international commitments. I think had we had international commitments with Constellation, then that program might have survived as well,

because you can't just enter into high-level agreements with other nations and then just say, "Oops, sorry, I changed my mind." That just isn't the way to do business.

As I look now towards what I personally want to do, I certainly hope I get to work in MPCV. I really want to work on that, and I'm actually excited about the commercial crew, would love to be involved in that as well. I don't think commercial crews should be the only thing we're doing. We shouldn't put all our eggs in one basket. To be involved with that and to have that succeed, I think that would be wonderful. I think to have people have the chance to go into space, the tourism industry, where they're talking about space hotels and all, that sounds kind of unrealistic, maybe, but then the same could have been said true of commercial aviation. Fifty years ago, who thought that we'd be all traveling all over the world in matters of hours? I think that'll be really exciting, so I think there's an exciting future ahead, but I think it's going to be a hard couple of years of transition. I hope it's all going to work out.

ROSS-NAZZAL: You hope to fly with one of these commercial interests, since you've flown in space before?

FISHER: I would love to. I would love it. I'd like to be able to just go into space and be able to just have fun and not have to work. Go on a vacation in space. Flying on the Shuttle was so much fun, but, boy, you work. You work very hard. Every minute you're conscious that you've got a job to do and you've got to perform it, so it's not like going on a vacation and kicking back and relaxing. It would be so much fun to go into space and be able to do that too.

It would be fun to have people who can write and who are artists. Not that we haven't had that within the astronaut corps, because we certainly have folks like that, but it would be neat for other people who have different outlooks to experience that, so it'll be fun.

ROSS-NAZZAL: I thank you very much for your time today. We certainly appreciate it.

FISHER: Thank you. Thank you.

[End of interview]