WILLIAM F. "BILL" READDY

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Interviewers: Mark Davison, Rebecca Wright, Paul Rollins

Readdy: [In November 1993 I performed]. . . kind of a site survey of Star City and the Russian, I guess, aerospace facilities there in Moscow. So that's kind of where it started, and then-well, I guess, actually it started even before that. I wound up going off to the Defense Language School right after I landed in September of '93 off of STS-51, and went out there [to Monterey, California.].

The plan was to train as Norm [Norman] Thagard's backup on the Mir 18 flight. At the time there was Mir 18A and Mir 18B, and the Mir 18B part was fly up on [STS] 71 and then come back on the Soyuz after a month's stay on the Mir. Of course, at that point, the Soyuz was being considered as the emergency crew return vehicle for our new International Space Station in partnership with the Russians. So it kind of made sense for a pilot astronaut to get a chance to see the deorbit entry piece, because Norm would have had a chance to see the ascent portion.

But then the Mir 18B part of that didn't pan out as part of our initial partnership [with the Russians], so at that point I wound up going back to the astronaut office and working at a couple of different things until the following summer, and that's when I went over and did [a] tour as DOR for four months. Then when I concluded that, I was just pleasantly surprised, a fax rolled in. First of all, when the faxes were working over there, when the phones were working over there, we were, you know, just ecstatic, and when the fax rolled out of the machine on that curly kind of [paper] it comes out on, is the announcements of STS-76 and 79. So it was kind of a pleasant way to leave Star City, with a mission assignment [as Commander of STS-79, a mission to the Mir space station].

Davison: Let's talk a little bit about your DOR assignment.

Readdy: Okay.

Davison: I know you relieved Ken Cameron, but I'm sure everything wasn't up and running, from the stories that we've heard. Tell us how that all transpired.

Readdy: Well, the objective was to prepare the ground and make sure that the two initial crew members that were over there, Norm Thagard and Bonnie Dunbar, got the support they needed, basically from soup to nuts. I mean, not only from everyday living kind of accommodations all the way through all the technical and professional training and all the travel and support and everything -- just the geography of the Moscow area is pretty daunting. Star City is not inside Moscow. Depending on the roads and the weather, it can be a couple of hours outside of Moscow, and so the logistics are kind of daunting, but the

idea was to support them. Of course, that means also supporting the trainers and experimenters and all the other NASA folks that kind of go along with that.

So that was where I kind of took the handoff from Ken Cameron. He had done a really spectacular job, I thought, of establishing our initial presence there, and so when I walked in the door, we already had kind of an administrative assistant already hired up, and we had an INMARSAT satellite terminal that he'd brought with him. So with that and a small office, we kind of set up business.

Davison: You said this administrative assistant that he had hired, was this a Russian local?

Readdy: Yes. Natasha Dorinshenko has been just spectacular over there. She was actually a native of Star City, and her father had been a colonel in the Russian Air Force on the staff of the Cosmonaut Training Center. Star City really is a little tiny city. It's self-contained, and all the services are there, and there are several generations there. There's the original cosmonauts and their trainers and then, you know, kids and grandkids and grandparents, and everybody all kind of lives in this self-contained town. So Natasha was kind of like the second Star City generation, and she was real helpful because, of course, she grew up there, and she knew everybody and everyone knew her. It's a small town. So she was real helpful in at least pointing the Americans who were kind of slow to come up to speed who we should need to talk to and how we should go about obtaining the different permissions and how to make our suggestions so that the Russians would understand what we were talking about because we came from such totally different traditions and cultures, that bridging that gap was very, very important.

The other thing that Natasha was invaluable with, because of her connections she was very able to provide other staff for us in terms of translators and drivers and engineers and things. So that was helpful. She was able to get us the right people that we needed to help do the job.

Davison: It seems like that's very important, to have the right people to get something done, and you don't always know because it's never written down. Is it true that you have to just kind of ask or know the right people?

Readdy: We tried to do all the right kind of homework long before that. I mean, all the lessons learned from the Apollo-Soyuz program, all the folks that we'd had a chance to talk to that had previously been there, like the French cosmonauts, for example. I had flown with Ulf Maribolde [from Germany and ESA], who was currently over there training for a mission, so we'd had a chance to talk with the ESA people. What we had tried to do is learn all their lessons up front and then step out as briskly as we could, recognizing that we had a long, long way to go. And the other thing is that we had a very big program.

This wasn't just a one-off event kind of like Apollo-Soyuz. This was establishing the bridge to International Space Station and potentially decades of cooperation.

What was a little bit surprising to me, pleasantly surprising, is although these were a couple of vestiges of the infrastructure that were left from Apollo-Soyuz, like the Control Center in now Kaliningrad, renamed Korolev, the Control Center was built for Apollo-Soyuz, the "Prophie" there, quarantine facility there in Star City, was built for Apollo-Soyuz to house the international crews that were training. There were several physical remnants, but the real important thing was the fact that there were all these relationships that, although dormant, were still there, and the Russians had very, very pleasant memories of the collaboration during Apollo-Soyuz. For example, I saw Victor Blagov this morning. He was one of the flight controllers during Apollo-Soyuz.

So, everywhere we went within the Russian aerospace industry, most of the same principals were there. Vladimir Serimiatnikov, who did the docking adapter, the docking mechanism for Shuttle-Mir, had built every single docking mechanism for the Russian space program, every single one, and he's still there, and he helped collaborate on the design for the one that's going to fly here tomorrow up to Mir, that's the International Space Station docking system, which is very subtlety different, but still one of those things where there's a continuing theme, I guess, within the Russian aerospace industry, a lot of the same people, and, like I say, their memories, their pride, I guess, in participating in Apollo-Soyuz carried forward, and it was really nice to have a foundation of those kind of relationships to build upon.

Davison: Who was your primary point of contact in Star City, working with the training side of the house?

Readdy: General Glazkov, General Yuri Nikolaiovich Glazkov, was the primary one who occupied himself with all the training, all the Phase One initiatives that we were starting to kick off. So he was the primary one. Also Colonel Kargapolov, who is in charge of training. And then there were literally dozens of people who were all involved in various levels on making the way for Norm and Bonnie a little bit smoother. Of course, those two are the real pathfinders, I suppose, kind of established the path for everybody else to follow.

Andy Thomas, who's on board the Mir right now, and all the crews of International Space Station, they're currently in training right today in Star City.

Davison: Let's talk a little bit about your flight on STS-79. You told us how you got the news there on the fax over in Russia.

Readdy: That was something. That was a surprise, I'll tell you.

Davison: Let's talk about the mission and your crew a little bit and what it was like to be able to visit the Mir after working with all the Russians in Star City.

Readdy: Well, there are a lot of surprises. I guess being assigned to the mission was a very pleasant surprise, for starts. Working with the Russians, in a lot of ways it's kind of like Old Home Week, going to Star City, a lot of the same people. I guess also the opportunity to have seen how STS-71 and 74 and 76 unfolded. It kept building a little bit more, a little bit more, a little bit more.

Our flight was kind of interesting because it was the first flight to the now-completed Mir space station, because Spektr had arrived just prior to STS-71 and now the Priroda module, which was intended for Earth-focused scientific research, the Priroda module had arrived. So the Mir was now in its completed configuration. We were flying the first flight of the double Spacehab module, which incorporated not only logistics, but also science experiments. So that was kind of interesting as a first. Certainly it was the first for me, as a working commander, to do a docking. I had a chance of flying with Frank Culbertson on STS-51 to go through rendezvous training and everything else, so I felt pretty comfortable with that, and over the years had worked on a lot of the procedures for International Space Station rendezvous and docking and then Shuttle-Mir rendezvous and docking.

But what we didn't anticipate was a problem with the new glue that they had selected for the solid rocket motors, and as a result of the flight just before us, they decided that they were going to have to de-stack and stack us up again. So we had a little bit of a launch slip that, I guess, just fortuitously, depending on whether you want to look at the glass as half full or half empty, it meant that Shannon [Lucid] had to spend an awful lot longer on Mir than she planned, which I think Shannon's girlhood dream to run her own laboratory was such that that actually, you know, fit right in with her plan, and it also allowed her to set the world record for time in space, and they were still ready for us when we got there.

The unpleasant surprise, though, was Gennady Manokov, who is the Russian commander that I had been training with in particular, five days or so from launch was medically disqualified. So instead of Gennady and Pavel Vinogradov flying that particular increment, it wound up being Valeri Korzun and Sasha Kaleri, who were part of our training also, but can you imagine getting tapped on the shoulder five days before a six-month stay in orbit and being told, "Hey, you're it"?

So there were a bunch of different surprises, but once we finally came down here to the Cape to strap in early that morning, there were no surprises. We launched exactly on time off to the Mir station. Shannon, I guess, was tipped off to our launch and everything else, and she said she could see the final portion of our ascent from where she was as we were catching up to the Mir.

Davison: Can you talk a little bit about the amount of supplies that you transferred? I think I read somewhere there was like 7,000 pounds that was transferred back and forth, and some of it was pretty urgent.

Readdy: Well, it points to the fact that a space station needs to be maintained, because there's nothing up in space. You can have solar energy, I suppose. Maybe that's up in space, but your food, your water, all your experiments, your fuels, everything has to go up, and then hopefully the fruits of your labor, not to mention the people, come down. So it brought home the point that logistics--and the other thing is planning logistics is a very, very critical element of a space station, and the Russians obviously understand that. They can respond very, very quickly down to the last day or so with their Progress by putting must-ride parts and different things on board. With the Spacehab, we were also able to do that, because the Spacehab was installed on the pad vertically. So they could respond very, very late to changes in hardware that we had to fly to maintain the Mir.

The other thing is you could also [do], at the pad, add certain things either into the module if you absolutely had to or you could do that in the Shuttle [unclear]. So it pointed out the fact that you have to be able to respond very rapidly, depending on what the situation is, and bring some must-ride hardware.

The other thing was, bringing things home is also important. Before the Shuttle started flying to Mir, the Russians weren't able to really do a tear-down inspection on all the hardware that had failed-the gyrodynes, the "Elektron" that generates oxygen, disassociates water and hydrogen and generates oxygen that way. A number of their other subsystems that they had had problems with they never had a chance to do tear-down inspection. They didn't necessarily understand the failure mechanisms. Well, the Russians are a critical part of International Space Station. They build an awful lot of that same kind of hardware. So it's been fortuitous, I think, for our program that we've been able to brings like that back.

But just the volume of things is unbelievable. Tom Akers was our flight engineer, but he was also our loadmaster, and the task fell to him and other folks on the ground to keep track of all those 8,000 pounds of logistics, and some of them are really small piece parts and some of them, of course, are big huge assemblies, and all of them in their own way are equally important. So they've got to go from the Earth to wind up where they need to on that space station and vice versa, and that is a very daunting, daunting task, and Tom did just a masterful job of it.

The other two things that you probably take for granted, though, that we transferred were air and water. We transferred a ton of water, literally, twenty of these water receptacles to the Mir, and also, just before we closed the hatch, we overpressurized the orbiter slightly in order to pump up the level of oxygen on board the Mir station, not to mention John and Shannon, which was another little logistics piece of the

mission. I think probably if the mission is remembered ten or twenty years from now, it'll be remembered for being the one that “rescued” Shannon from the Mir.

Davison: One of the other crew members on your flight, Carl Walz, you'd flown with before, and now he, I believe, is listed as one of the ISS crew members. Do you think he gained a lot of good experience being able to go up on Mir and see how things were and bring that into the station?

Readdy: Oh, absolutely. Absolutely. Carl's got a wealth of experience. We flew together on STS-51, and he had a chance to do a space walk on that, developing a lot of the tools and techniques for the Hubble Space Telescope repair mission, and he brought that to this particular flight. We didn't have an EVA. As it turned out, that was one of the unpleasant surprises. If you look at our patch, you see hands shaking, two gloved EVA hands. Well, originally it was supposed to be our mission to do the first joint space walk, and so Carl, obviously, and Jay Apt[unclear] ideally suited to go do that because they'd been obviously both got experience before on previous flights.

But Carl really took the language to heart and learned Russian. It put him, I think, in very good stead for this International Space Station. I think on the third increment they'll be doing assembly tasks, I think, in the Russian suit and the American suit. So I think Carl is kind of jumping from one to the next to the next in kind of an evolutionary path from STS-51 to 79, to International Space Station.

Davison: I think we're just about out of time, but I have one question, if you could tell us what your most memorable story or experience was on the Shuttle-Mir Program.

Readdy: Oh, gosh. There are so, so many. You know, it's probably a tie, I guess. There are things that you remember visually and there things that you remember, I guess, kind of emotionally. I remember first looking out the overhead window when I saw the Mir during the rendezvous. I could just see it as the brightest star in the sky, and I remember somebody, when I flew my first flight in January of '92 called me up to the flight deck and said that, "Hey, in five minutes you're going to be able to see the Mir go by," because we were in similar-type orbits. So I remember floating up to the flight deck, and I saw the Mir go by, and I guess never would I have thought, given the political situation back then, never would I have thought in a million years that we'd be joining not only physically with the Shuttle-Mir, but also joined up in this International Space Station.

I guess to look back on it, as I'm sure we will ten or twenty years from now, I think people will remember the Shuttle-Mir and the Phase One program as being the first real swords-to-plowshares program that really forged the relationship between the U.S. and Russian programs and was really the bridge into

the next century of International Space Station.

Davison: Thank you very much. Enjoyed it.

Readdy: You're welcome.

[End of interview]