

## **VICTOR BLAGOV**

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Interviewers: Rebecca Wright, Paul Rollins, Mark Davison  
[Interview conducted with interpreter from TTI]

*Wright:* We would like to begin by asking you if you could tell us something about your educational background.

*Blagov:* I graduated from Moscow Aviation Institute. My specialty, my major, was aircraft engines. I graduated from the Institute in 1959. I have been an airplane engineer.

*Wright:* How did you begin your career in the space agency?

*Blagov:* At that time, of course, there was no space agency. At that time the distribution of assignments was not straightforward. The government had a placement for us after we graduated from the college, the university, the institution. There were a number of institutes that would recruit graduates from various institutions, and I was initially assigned to work at the Flight Testing Institute [FTI] in Zhukovsky, because my specialty was actually to perform testing of the aircraft engines.

Shortly I met some people from the space organization, and they offered me a job with their company, and that's what I did. So before I started working [FTI], I liked the idea and I did the transfer. That happened in April of 1959. You probably remember that in two years was the first manned space flight, the Gagarin mission. Two years after that, at that time, in the company where I worked under the guidance of Sergei Korolev, a special designer's department was created to design manned vehicles. That was actually the first work that was assigned to me when I came to Energia. Mostly my responsibility was to design the rescue vehicles. That was the first rescue vehicle designed in the form of a sphere, and that was a very challenging job because we had to provide certain features such as to protect against high temperatures caused by the friction in the atmosphere and also to develop layout to accommodate various equipment inside the sphere, which was also challenging. So those were the first two tasks I was assigned to, and I worked on these up to Gagarin's flight.

Then I continued working on the Vostok Project and I was terminated. You probably know that after one person, one man Vostok vehicle, we had two men Voskhod vehicle. Actually, the first EVA [Extravehicular Activity] was performed by Aleksandr Leonov on this vehicle, Voskhod II using an airlock, and I was actually responsible for the air lock design and its interface to the spherical capsule.

After that, we created another vehicle that was for three crew members, and we also used these spherical-shaped rescue vehicle. One of my colleagues, Mr. Feoktistov, flew on that vehicle. So that was the final mission of the Vostok era. After that, we started the transition to newer spacecrafts. I consider

that experience to be extremely valuable, an incredible technical experience during those years, and I consider myself extremely lucky that right after college basically I ended up in the right place at the right time. So that was my beginning of my career.

*Wright:* And now he's involved in the Shuttle-Mir Program. Could he tell us how his involvement began with that program?

*Blagov:* Well, before the Shuttle-Mir Program started, I got involved in Mir Project, so basically I was just one of many people working on the Mir Project. Then when the decision was made to start the joint program, the same people got involved in the Shuttle-Mir Project. That's why I remember our first visit to Washington to coordinate the very basic agreements between the Russian and American sides to actually start the program.

So the first program was Mir-Shuttle Program, which actually consisted of only three Shuttle flights to Mir. The first mission was not a docking mission; it was just a rendezvous, an approach, and that was it. And then two others docked to Mir station. At the same time we started negotiations on the International Space Station Program. So when it became clear that the International Space Station was actually going to take place, there was another decision made to have a transitional phase between Mir-Shuttle and ISS programs, something that we call now Mir-NASA. So this is something that's supposed to be a transition to Phase 2, and we just started to call it Phase 1. One of the main reasons to have Phase 1 prior to the International Space Station is to gain as much experience as possible on technical design and operation of various systems so that we can use this experience in future missions.

By that time we actually had a draft of the preliminary design of the next orbital station, something that we call Mir-2. Here in the United States you continued working on developing the Freedom Station. But eventually we just decided to use all these individual experiences and just put it all together in one program, to be a joint project. If you are familiar with the Mir-2 design, then you will probably see a lot of common features of the Russian segment of the International Space Station with Mir-2 design. I think that it's only natural that we used our previous experience.

*Wright:* You had many duties when you were working just on the Mir. Did you continue the same duties or did those duties increase as you became part of the Mir-Shuttle?

*Blagov:* Well, pretty much my responsibilities are the same, because from the very beginning when we just started the Mir Project, there was a deputy director of the Mir missions, and that pretty much stays to this date.

*Wright:* Could you please explain some of those duties and responsibilities?

*Blagov:* For each mission we have a mission director who has several deputies. One of the deputies, of course, has pretty much the general responsibilities, so called like general issues responsibility, and this person can actually take the responsibility of being mission director when the mission director is not present. Then we have a lower level of deputies. For example, we would have a deputy on medical subjects, also a deputy responsible for all of ground tracking stations. Depending on the program, we have several deputies for the mission director.

Basically my responsibility is the planning of the mission. Actually, I am heading the planning department. This department prepares instructions and on-board communication, as well as the documentation for the ground personnel at mission control centers. This is still my responsibility as it was during Phase 1. I'm going to continue this in Phase 2.

*Wright:* How long have you been doing this?

*Blagov:* Since 1959. It is probably surprising for Americans, but in Russia we have a tendency, our approach is that we like people to kind of stuck to their specialty and not to rotate people as often as is happening here. I remember in the seventies I was involved with the Soyuz-Apollo mission, with our American counterparts, and it's interesting that many of the Russians who were involved in Apollo-Soyuz mission are still working and still doing the same work as they did in the seventies, but I can only think of one or two Americans who are still doing the same work they did in the seventies. So you actually have a high rotation in your program.

Jay Honeycutt just recently retired. He was head of the Johnson Space Center. I remember him when he was still the chief instructor for the American ground crew, the ground personnel. So he and his Russian counterpart worked together on developing the procedures for ground personnel training during the Apollo-Soyuz mission. So he's the one person I remember.

The second person that I remember is Morris Kennedy. He's responsible for operations during Phase 2. There may be one or two more people that I would still remember from those days.

*Wright:* We had the opportunity to visit with Paul Dye earlier this week. He was sharing with us his admiration for the expertise that you have.

*Blagov:* It probably makes sense because we've known each other for so long, but I think that expertise is maybe not as important as something else that I'm going to mention right now. I think that the most important thing is to learn to work as one group. There were a lot of problems of all kinds--technical,

linguistic, even political, but, fortunately for us, we were able to resolve all of these problems. It turned out we have very similar ways to deal with challenges, and everybody is determined to overcome the difficulties as soon as possible.

So now I think our task is to actually teach new people who are coming for Phase 2 to deal with challenges. Actually, on the Russian side, we try to keep the same people, just transfer them from Phase 1 to Phase 2, and there will be actually quite a bit of people transferred from one program into another. I understand that on the United States' side, it's not quite the same. The approach is not quite the same. There will be a lot of new people coming for Phase 2. It's going to be an all new start from scratch. So our task is to maintain the consistency and not to repeat the mistakes. That's why we try to keep the same people involved.

*Wright:* Would you share with us, please, some of the most memorable experiences working with the Americans with this program?

*Blagov:* You mean Phase 1?

*Wright:* Phase 1.

*Blagov:* The first Shuttle mission was extremely memorable, STS-63. It was amazing to see these huge vehicles which weigh more than 100 tons approaching each other, actually coming so close in a very short distance.

Actually, the Shuttle came to a distance of 9 meters to Mir station. So I remember how anxious we all were, considering what could be the consequences of an impact. In the beginning, we actually didn't plan for the Shuttle to approach Mir closer than 100 meters. Then I remember long discussions. We agreed to have it come to 30 meters' distance. That's the minimum distance accepted in Russia for any vehicles that are coming close to the station. This is actually determined by the situation when the vehicle loses control and starts spinning. The 30-meter distance is the minimum safe distance that allows the vehicle not to get in contact with the station.

And then I remember the proposal came from the U.S. side to choose the distance to 9 meters. That was a real challenge for us, because we had to think of so many measures to assure the safe rendezvous. We had to have very firm justifications for why we wanted to have Shuttle so close to Mir station. So eventually we all agreed on such a procedure and found a solid justification to be within this hazardous range because the next time the Shuttle would have to dock to the station and it would be extremely valuable to try to play this scenario as close as possible to reality.

So we all came to face these challenges and were able to agree on short distance. As you know, that mission was a big success.

*Wright:* Yes. How were the experiences or how was the atmosphere in the control room when the two space vehicles united with the docking module?

*Blagov:* That was not the first docking. What was special about that mission is that the Krystall module, the one to which Shuttle docked during STS-74, was redocked to the side port. That was a very unusual configuration for the Russian side to dock. We always prefer to have a configuration where all modules are pretty much docked in one place. Soyuz and Progress vehicles would come to the main access. So that was the first radial docking. So in order to assure the success of the Shuttle mission, we had planned the Soyuz mission where Soyuz would have to dock to Krystall port, also the regular docking. So at that time when I had three Soyuz vehicles docked--two Soyuz vehicles and one Progress vehicle docked to the station, so basically we just created the configuration that was later on adapted for all Shuttle missions to Mir. So that's how this mission was different.

*Wright:* You've explained your feelings or your most memorable [experience] with the Shuttle-Mir. If you could tell us, you spent forty years in the space program, is there something that's very significant to you that you'll always remember?

*Blagov:* I'd like actually to be able to remember everything that has happened or will happen, because any new mission brings something that has never been done before, and there is always a risk and always an anticipation that something will be happening that we don't expect. So I think all the memories are extremely valuable. For example, we had so many dockings of our cargo vehicle to Mir station, and we had one that ended up in this collision with Mir. So it's like driving a car: you should always be cautious and careful.

Of course, you remember the best something that you've never done before and you finally do it, and this is the most memorable experience. I remember working on the program, actually developing a plan for the mission that would orbit the moon with people on board. We already got used to just doing these flights, orbiting the Earth in geostationary orbit so they are not so exciting anymore, and that was the first vehicle that was supposed to return to Earth after flying with the second level. In theory, we understood everything well, but, of course, nobody knew what would be the outcome of that mission.

So the vehicle had to enter the atmosphere twice to end that mission. It lowered its speed after the first reentry, then after that it would glide again outside of the atmospheric layer, and then would reenter

again just as a regular Earth satellite. So, of course I will remember that project, because it was very challenging to do. We launched thirteen vehicles, unmanned, and we were practically ready to do the manned flight, but you landed on the moon, actually using the same return algorithm we proposed.

So, for some reason, when we were completely ready, our government decided that it wasn't worthwhile doing this anymore. It was a political decision, because technically I think we had to just put a closure to it and do it. It's not important who was the first time.

*Wright:* It's nice that the closure to Phase 1 leads into the beginning of Phase 2.

*Blagov:* I think that we are all really lucky that we are going to continue. I'm extremely sorry that we wasted so much time after the Apollo-Soyuz mission. We were moving in opposite directions for such a long time. Only in the last few years we really started coming towards each other. And we should be happy that the process began, so we will combine our potentials, and we will use each others' experiences, and enjoy the fruits of our mutual labors. Because I'm sure that neither side would be able to continue on its own. The Mars Program will not be able to survive without joint effort.

Just on a purely philosophical wave, I think that mankind needs something that would lead to the unification of people. I think that it is extremely important to do something that will benefit everybody, and not fight with each other in wars. Wars are too expensive; we can't afford wars anymore. I think it's much smarter to spend money doing something like the International Space Station or something similar. Then politicians will not have an opportunity to make wrong decisions.

*Wright:* Are you planning to continue until we reach Mars?

*Blagov:* Well, I think that this probably will be done by not my children, but my grandchildren. I've heard that some scientists feel this will not happen in the next twenty years. I'm sixty. I'll be lucky if I'll be able to see it on TV.

*Wright:* Maybe if we continue our relationships as well as they've been in the last few years, maybe we can get there sooner.

*Blagov:* Let us hope so. This is something we can all look forward to, and another reason why we should continue in Phase 2. If we resolve Phase 2 problems, then we can probably consider ourselves ready for the Mars Program.

*Wright:* This concludes our interview. We don't want to take too much more of his time. We would like

to see if you have anything else that you'd like to add.

*Blagov:* I don't really have anything new to add, other than just saying again that I think I am--and we all are--very lucky to be able to work together on this project. In 1975, the Apollo-Soyuz mission was maybe just a single event. Nevertheless, I think it was an extremely important step. But I think that what we're doing now is the right thing. The continuous operation is very valuable and important.

*Wright:* I'm glad that you've stayed all these years, that your challenges have continued, and at least they have changed.

*Blagov:* Yes, it's never boring. It's never boring. We have the same challenges all the time or we wouldn't have any challenges. Sometimes I think when I have some free time on my hands, I'm going to write a book about contingencies and how useful they are. Maybe it sounds strange, but the real learning occurs not when everything goes smoothly, but when something goes wrong. It speeds up the learning process and prevents the next contingency and allows us to find a solution much quicker. Unfortunately, the smooth mission, when everything goes fine, just weakens personnel. But these are already the specifics that I'm sure our American colleagues will learn when we start working on long-duration missions.

I'm just talking about the situation when an operator never exposed to contingency, and it was actually a dangerous situation, because it's easy to oversee. You get used to everything being fine. But as I said, you have to be--in fact, just to keep ground personnel on their toes, when everything was fine with the mission, we would introduce some contingencies just to make sure that they can react promptly to the simulated contingency. This is one of the greatest differences between short-duration and long-duration flights, so the American side will have to learn how to deal with these situations. So we'd like to share our experience with the American colleagues so that they won't repeat our mistakes. Then that will allow us to move forward more quickly.

So, thank you very much.

*Wright:* Thank you.

*Blagov:* It was nice to recall some of the things that you're asking about. As I said before, I'm extremely lucky to be where I am. I wouldn't want to be an astronaut. Maybe it sounds strange, but I just want to do what I do now, because I think it's the most exciting thing.

*Wright:* I'm sure it's very reassuring to the astronauts to know that you're down on the ground.

*Blagov:* I think the astronauts like to think that there are experienced people on the ground working with them.

*Wright:* We wish you continued success.

*Blagov:* Thank you. We'll try.

[End of interview]