NASA JOHNSON SPACE CENTER ORAL HISTORY PROJECT
EDITED ORAL HISTORY TRANSCRIPT

MICHAEL L. COATS
INTERVIEWED BY JENNIFER ROSS-NAZZAL
HOUSTON, TEXAS – NOVEMBER 9, 2012

ROSS-NAZZAL: Today is November 9th, 2012. This interview with Mike Coats is being conducted for the JSC Oral History Project in Houston, Texas. The interviewer is Jennifer Ross-Nazzal, assisted by Rebecca Wright. Thanks again for taking some time out of your very busy day to meet with us and talk about history and your space flights.

COATS: It dawned on me, I've lived a lot of history. It happens if you wait long enough.

ROSS-NAZZAL: Especially a lot of JSC history. One of the questions I wanted to ask you is about your recollection of being assigned to [STS-]41D.

COATS: Well, what I remember is they called us over to George [W. S.] Abbey's office. He was Director of Flight Crew Operations. We had an idea, since the five of us were walking over together, maybe we had a crew assignment together. Pilot-wise we were competing within our astronaut class to fly as soon as possible. I was in the middle of the class I think. I had been support crew for STS-4, Ken [Thomas K.] Mattingly and Hank [Henry W.] Hartsfield, and a CapCom [capsule communicator] for their mission. So I got to know obviously Hank and Ken very well.

Hank asked for me to be his pilot when he became the commander. That was quite gracious of him. I appreciated that a lot. So they called the five over, and we went up to

George's office, and he basically—George would mumble like George always does, "You still want to fly?" What answer does he expect? So we were pretty excited about it.

Now the mission changed almost immediately.

ROSS-NAZZAL: Were you assigned to [Space Shuttle] *Discovery* initially?

COATS: Yes, they assigned us to *Discovery*, and that was neat because we got to go out to Palmdale [California] while it was still being manufactured, or finished up out there, and spent some time in the Orbiter in the manufacturing facility at Palmdale, which was really neat.

Then we got to be there along with several thousand people when it rolled out of the barn there. That was pretty dramatic. We had a stage area and we were up on the stage area. People were surrounding us next to the hangar. The Orbiter was being towed around the hangar, so it slowly appeared. You see the nose first and then it just gets bigger and bigger and bigger as it comes around the side of the hangar and then it turned toward us. It stuns us. Actually we were all shocked at how big it was. Even though we'd seen it and been in it, it was always surrounded by platforms. Then to see it being towed and realize what a big vehicle it is. And to think, "This is going into space. Holy cow!" It's a 200,000-pound machine going into orbit.

I was standing next to Hank, and he said, "Good God, it's big."

I said, "That's what I'm thinking too." That was a nice event; it was a beautiful day out there. That was a memory to have. I remember they handed me a baby—I had the reputation of liking babies—they handed me a baby. We're all in our blue flight suits, and of course just as I get to right here [gestures], the flood opens up. The crowd got a big kick out of that. I was lucky I wasn't quite holding him yet. So that was a good memory.

That was nice that we knew we got to fly the maiden flight of a vehicle. The payload changed. At first they had us with one of Boeing's interim upper stages, a boost stage to carry the satellite up there, so we spent a lot of time up in Seattle [Washington]. We made a couple trips to Seattle to visit Boeing and learn about the interim upper stage, the IUS.

That was nice. We got to meet a lot of people. In fact we learned a lesson. There are several thousand people that worked up there. At one point they said, "Would you mind signing a few pictures?" Hank said, "Tell you what, just send us a list. We'll sign them."

Judy [Judith A. Resnik] is sitting there saying, "Are you sure you want to do that, Hank?" Sure enough we got home and they sent us a list of 1,200 names. We were signing till our hands ached. But they were really nice, and the folks worked awfully hard to support the mission.

Then the payload changed. They had some delays, so we ended up taking up three satellites and carrying up a solar array of course. Judy and I had responsibility for the big solar array, the 110-foot solar array, much like on [International] Space Station. We used that mission to extend it out, uncoil it, just like we do with those arrays, and slowly unwind the mast and pull it out. Then it was my job to put in the maneuvers of the Shuttle to try to excite the mast. We had lots of cameras to record how quickly it dampened out.

Judy did a marvelous job because it turned out it was stiffer than they thought. It dampened out much quicker, which meant we could actually get a lot more of the testing done in the time we had. So we did a lot of real-time replanning. Judy was really good at that. We got a whole lot more data back than we had anticipated, which was nice.

Of course we deployed three satellites. That was cool. When we first opened the payload bay—remember this is the first flight of an Orbiter, there's usually a lot of stuff that floats up when you get zero gravity. In this case a Coke can floated up. I remember, we had two

turntables. We had one satellite that was going to roll out of the payload bay, but two of them were going to spin up on turntables and go out.

Here comes the Coke can floating out. We asked Henry. "Think we ought to tell the ground about that?"

He said, "What are they going to do about it?" Nothing. So he didn't tell them. To this day we didn't tell them. But it was a good flight. I told you the IMAX story with Judy's hair, which meant I got to do all the IMAX camera work.

But, it was a fun crew. It really was. Steve [Steven A.] Hawley and Hank and Judy and I loved to tell sports trivia and tell jokes. [R. Michael] Mullane hated sports, but he was the funniest one on the crew. Like I told you, when you get tired and you've been up for a couple days, you get really tired, and nothing much seems funny when you're really tired. Mike could be funny sometimes. The more tired we all got, the funnier he got, which really helped keep us all loose. I appreciated that a lot.

We had some long days in training and long days on orbit up there with the ice problem we had. Those are my main memories about that mission. Just a really fun group of people to train with and work with. We had a pad abort, then we got delayed two months. That was fun. Having Judy on the crew, she gave as good as she got. She wouldn't put up with anything. We'd tease her mercilessly and she'd tease us right back. Mike says in his book that he had a crush on her. We didn't realize that at the time. Very professional. I think he's exaggerating that to sell books or something.

ROSS-NAZZAL: You had a payload specialist on board. How did you adjust to bringing Charlie [Charles D.] Walker on board? How did he fit in with the rest of the Zoo Crew?

COATS: Well, Charlie worked really hard. We had no problem at all adopting Charlie, including him in the crew. We thought the payload that he was operating, the experiment that he was operating, was pretty important. When we got up on orbit he had lots of problems with the machine. This was the first time, and he flew several times trying to get this thing to work properly. So Charlie, from the time he woke up until he went to sleep, was downstairs working on that machine. We joked. I don't think he got upstairs to look out twice the whole mission, just working his tail off. We had an awful lot of respect for Charlie and how hard he worked. He wanted that thing to work. He used it to produce very pure medicines and products. You can do that in zero gravity, which you can't do here when gravity is stirring things up.

We wanted that to work as well as anybody did, so we didn't have any problem adopting Charlie as payload specialist. He was just really easy to get along with. Still is. Nice guy. We stay in touch. It really was a pretty good enjoyable crew. There weren't any difficult personalities. I know some crews you have some people that are a little more difficult to get along with than others. That was a good crew.

Like I said, this flew before [Space Shuttle] *Challenger* [accident, STS-51L]. It was almost like a dream job. Things couldn't get any better. Training was long and arduous and we loved it. The flight was fun. We had challenges to overcome and did. I'm really proud of that. Then of course *Challenger* made us realize it's serious business. People can get hurt. It made it more like a real job instead of a dream. That was a good crew.

ROSS-NAZZAL: Sounds like it from everyone we've talked to. I wondered if you could take us through your recollections of launch. You talked about the abort on the pad, but what are your

recollections of that day, getting ready, going up to the pad, and actually launching into orbit? Any memorable events from that first launch?

COATS: I remember we tried to launch four times. We climbed in four times before we finally launched. I think the last time we went out, we walked out of the crew quarters, and a lot of cameras there, and get in the astronaut van. As we're walking out, I'm going [gestures with fist], "Like we're going to launch this time." A half smile, half oh, we're going to go. After the mission, I got called in by Jay [F.] Honeycutt, who was deputy of FCOD [Flight Crew Operations Directorate]. He said, "We got a letter complaining that you're a communist because you held your fist up and you stuck out your lower lip like a communist does." In all seriousness he said, "So how are we going to answer it?"

I was stunned that he would even ask me that. I said, "Jay, are you serious?"

He said, "Yeah."

I said, "Well, I think you ought to tell him what I'm telling you, which is 'Why don't you stick it up your ass?'" and walked out. Jay and I have been friends ever since. Good friends. But to this day if he mentions that I'll tell him, "Jay, you screwed up big time to even ask the question. I came back from Vietnam, I flew 315 combat missions, lost a lot of friends, and some kook is asking me if I'm a communist and you're passing it on. Are you out of your mind?" To this day I give him a bad time about that.

"We just had to go through the motions."

"No you didn't. Don't give me that stuff." So that was a memory of walking out and getting in the astrovan. Of course then you ride out, which we did four times before we finally launched.

When you drop off the Director of Flight Crew Operations near the Launch Control Center you stop and he gets out. We proceed on to the pad. The crew gets together in the van. Of course they didn't tell us this ahead of time. "Okay, let's get together for a prayer." And we're going, "Hmm?" We all get together and put our hands together in the van. Chief of the Astronaut Office says, "Dear Lord, don't let these guys screw up." And that's the astronaut prayer. So we did that the first time it's a surprise. Then of course we did it as a tradition the other times. It wasn't a surprise those times.

It was easier back then because you just wore the blue cotton flight suits. So getting in and strapping in [was easier]. If you were delayed on the pad—you could be delayed a couple hours. We didn't have something to rendezvous with, so we didn't have to worry about orbital mechanics back then. So you're time-limited by the time—the commander actually was the first one in—the time he had to lie on his back, theoretically. But of course we didn't lie on our backs. We unstrapped and sat up, because you could strap yourself back in, very comfortably.

Later on when we had the orange flight suits and you strapped yourself in, launch and entry suits, now you couldn't unstrap. You could unstrap, but you couldn't strap yourself back in, so it meant you couldn't unstrap. So you did lie there for a long time. That got to be painful sometimes, lying in one position for two and a half hours.

So we climbed in several times. I can't remember all the reasons we scrubbed. Obviously one was the launch abort. I think we had a weather problem and a technical problem. Finally goes. So people say, "What's going through your mind during launch?" What was going through my mind—and I think everybody else's—when the solid rocket boosters actually lit and started lifting off was, Thank heaven we're actually going this time." So it was one of relief for a microsecond. Then of course you're saying, "Woops, I better pay attention." You start doing

what you were trained to do, which is watching all your instruments and making sure everything's doing what it should do.

It was funny. Like anything you do, the first time things just go by in a blur. The second time, you notice a lot more things. The third time—things slow down in other words as you repeat it. That was certainly the case with launches. My first launch, it was a blur. You're glad that you are trained to a fine edge if you will, because if something happens, you react automatically. That's what you've been trained to do.

So you don't have to think about it a whole lot, and that's a good thing. I was impressed on my second mission. Even though I was in the commander's seat now, things seemed to come by slower, and I could notice more things, even though I'm on the other side of the cockpit. By the third mission, I could actually talk almost constantly to keep the people in the mid-deck informed about what's going on. They can't see anything down there. So I'm calling off altitudes and airspeeds and things like that to them, which I couldn't imagine doing on my first launch. Suddenly it was over. So things really do slow down, when you repeat it, do anything repeatedly, you get a lot better at it. You hear pro football quarterbacks say you just have to do it a thousand times and the game will slow down a little bit, but for the first hundred or so it's so fast you're just not really very good at it. Well, it's true about flying too. You have to do it a lot to be really good at it.

I remember on the first flight, I remember being impressed. Of course there was a lot of vibration during first stage. Solid rocket boosters are still firing. A lot of noise even though your helmet is on, and a lot of vibration. You're bouncing around quite a bit. I remember being impressed with the twang on the pad. Of course we had the twang when we had the pad abort, so

we knew what to expect, but it's a pretty good movement swinging back and forth. I remember being impressed how quickly it lifted off.

Now remember it's five million pounds sitting there, and you're going to accelerate going straight up, and you accelerate fairly quickly. It really lifts off and goes when you have seven million pounds of thrust. I was impressed. Wow, not only this huge flying machine, the Orbiter, but the fuel tank and the solid rocket boosters and everything was really moving quickly. That's a lot of power back there. So that sensation of an awful lot of power behind you was pretty stark.

Then I remember being impressed when the solid rocket boosters fell off with how quiet it got and how smooth. The main engines are very smooth and very quiet. We didn't hear anything really. Of course now you're pretty much out in a vacuum through the sensible part of the atmosphere. The air is pretty thin, so you don't hear any sound really out there.

Then it's a matter of the Gs [gravity] building up again after three Gs, and watching the engines throttle down. You're sensitive about what does three Gs feel like on you. It's not terribly bad. You hit about four and a half Gs in a Soyuz spacecraft, so that's a little stronger. But after eight and a half minutes you're happy that that guy got off your chest and you can breathe a little bit easier, talk a little easier.

Then I remember being impressed when I looked out the window and saw the Earth and how colorful and beautiful it was and how black everything else was. I must have stared at it for a minute because Hank said, "Okay, that's enough, we got to get to work."

You're so busy reconfiguring and you're not really moving around. You feel the sensation of floating but you're strapped in. Your arms are floating up. Get back down here so I can do this. But at least for the pilot. The mission specialists have to unstrap fairly quickly and

move their seats. So they've got to be moving around much quicker than the commander and the pilot who have a lot of reconfiguring to do from those seats.

It was probably another hour, hour and a half, before I'd get a chance to get out of my seat and actually float around for the first time. I remember the sensation coming out of the seat slowly. I wanted to keep my head up, at least up is an orientation in the cockpit there. There's really no up or down. Your vestibular system is screaming at you, "What the heck is going on here? There's no gravity gradient anymore. No down vector. What's going on?" So at least with me I was very careful to float up and then float out and float down. I wanted to stay upright in the Orbiter. That sensation was still there for about 24 hours I think. Reluctance.

I think after I went to bed and woke up I felt much more comfortable in zero gravity. Then sometime in the second day my brain anyway clicked in and said, "Okay, I don't know what's going on here but let's just get on with it." It just says, "We're going to get along just fine in zero gravity." Then you feel really at home, comfortable.

So those are my big impressions of the first launch. The last two launches reinforced all of those. I knew to look for them of course. But the first one is special because the whole crew has worked very hard to get up on orbit. Of course thousands of people worked very hard to get you there. As soon as you get there you're saying, "Wow, I can't believe we actually did it."

Then you're motivated and almost overwhelmed with the desire, "Let's get everything done we possibly can. So many people worked so hard to get us here. Let's accomplish every test objective. Every mission objective we possibly can." The crews invariably work really hard. That's something on the Space Station and on the long missions we're sensitive to. For a weeklong mission like we had, yeah, you can work 16-hour days for 7 or 8 days, because you're

only going to do it for a week. Even a two-week mission you can work pretty hard. But you're not going to do it forever. Just wear yourself out literally.

We mandate that the crews take a rest day. Essentially every week you get a day off to rest up there. You need to do that just for your mental health if you will. So the crews work really hard. Of course frequently you'll have a problem like we did with the ice buildup that will add to your workload quite a bit. That obviously did.

That makes you feel good when you deal with a problem. We did on the first mission and the last mission we had some problems. And the second mission, all three of them, we had to make some changes to the flight plan because of problems encountered.

It's fun to watch. You know because you've been a CapCom what the team on the ground is doing, both the front room in the [Mission] Control Center and all the back rooms, how hard they work. The Mission Evaluation Room is working very hard to overcome any kind of problem.

You feel like you're just a representative of a huge team that's really doing fantastic work. I had that feeling, and I know talking with other members of all three of the crews they felt like there were thousands of people watching us to help us. That's a pretty good feeling to know you're part of a really good well trained team. I'm sure Super Bowl winning football team feels the same way. That's an amazing team working together. I was never part of a football team that won. I can't tell what that feels like. But I can see you really feel like an awful lot of work has gone into getting you up there.

You want to make the team proud of you. That's a big motivation factor. As a crew commander I occasionally had to tell people, "No, go to bed. You just can't work all night. You got to go to bed, get some sleep or you're going to be wiped out tomorrow." Because you do.

You want to stay up and use part of your sleep time to get ahead or get more done, because you always got a long list of things you'd like to do. Anyway, any other specific questions?

ROSS-NAZZAL: I was curious. I did want to ask you just for grins. Mike Mullane says that you were nicknamed Superman because you had the looks of Superman. What'd you think of that nickname?

COATS: Of course the way it came about, we had two Mikes on the crew. When Judy or Hank or Charlie or Steve would say, "Mike," both Mike Mullane and I would answer. So Judy quickly said, "Look, we got to come up with some nickname." Now I told you the story about Tarzan with Steve?

ROSS-NAZZAL: No.

COATS: They were sending astronauts to the tracking sites around the world just for visits to show the flag. We didn't have TDRSS [Tracking and Data Relay Satellite System] satellites back then, so we had ground stations around the world. Steve and Mike went to the Seychelles Islands. Now remember the movie *Tarzan* with Bo Derek? Well, she and her husband John Derek were on the Seychelles Islands scouting locations for the Tarzan movie they were about to make. She had been in the movie *10*. So Steve and Mike got to meet them over there. That's tough duty obviously. So Judy essentially said, "Okay, I'm going to call Mike 'Tarzan' because he met Bo Derek and John Derek who were making a Tarzan movie, and I'm going to call Mike

Coats 'Superman.'" She did. She was really religious about it. Hank was pretty good about it too. Mike Mullane was pretty good about it too.

She tried to call Steve "Cheeta." He didn't appreciate that much. That didn't last very long. But that's how it came about, that nickname. I don't think there's much of a resemblance there. But boy, she stuck to it. It was always Superman and Tarzan.

ROSS-NAZZAL: Is that how the moniker Zoo Crew came about? You guys were known as the Zoo Crew. Hank I guess as the Zookeeper.

COATS: Let me think how that came about. That's a good question. Might have been. You may have heard some of our trainers hung up a bunch of bananas in the simulator one day. We climbed in and there was a stack of bananas hanging there. They said, "That's for motivation. If you do something good you can have a banana."

ROSS-NAZZAL: I did want to ask you. Of course as the pilot you helped to fly reentry back to Edwards Air Force Base [California]. What are your recollections of that first reentry coming back from orbit?

COATS: Well, my biggest impression was—of course it's dark outside when you're reentering, because we land early in the morning here, which means it's dark as you reenter. So your first impression is, Wow, the windows are glowing cherry red out there." The forward windows are red. Then the upper windows—remember you're cocked up as you're coming in—the upper windows, the superheated plasma is separating on those overhead windows. So it looks like

you're inside a fireball. The flames, the plasma reflects on the instrument panel, because it's dark outside. Of course it's lit in there, but the reflections are pretty dramatic. You really feel like you're in a fireball. Think about that. You've got the reflections of what looks like a fireplace on the instrument panels. The windows are glowing cherry red. You know it's really hot out there. Then you start to see sunrise through the cherry red windows. The blue sunrise starts to occur, and it's just spectacular to see.

I remember commenting about how beautiful it was. I remember Henry said, "Okay, pay attention now. Pay attention."

I'm going, "I'm paying attention. I'm looking outside." He meant no, you're paying attention inside. Unless something goes wrong you don't have a whole lot to do except make sure it's following the needles. Everything's automated.

I was enjoying the view. Unfortunately the mission specialists in the back can't see as well obviously as the commander and pilot can up front. They can see the cherry red windows but not much else. So that was my big impression, first reentry, was that we were inside a fireball and it's really hot out there. That was a pretty smooth ride.

Some of the crews have come back and said there was a little burble at about Mach 20 and maybe another burble at Mach 5. We were looking for that and didn't really see anything noticeable. Then of course Henry took over and started flying, as soon as you get subsonic over the field, 50,000 feet. It's important for the commander to get a feel for flying, because he's going to land it in a couple minutes. So he took over, as soon as you're subsonic and can do that.

Then usually back then the commander would let the pilot take it for a few seconds just to say he flew it. Henry did that, allowed me to fly it, which was nice. He flew around and made a really nice landing out at Edwards. It turned out the right strut was deflated a little bit. He

landed right on centerline, but because the wings went down on the right side, we actually were pulled off to the right. So now we're in the center of the right half of the runway as we're tracking down. I remember him saying, "Should I steer back to centerline?" I said, "No, why don't you just hold what you have?"

That was probably not good advice, because he did exactly that, but it ended up rolling out and stopping on the right-hand side of the runway. Of course what the media showed then, they had the helicopters flying over showing the Orbiter sitting on the right-hand side. On the news that night they were talking about how the commander had a hard time steering that thing down the runway. It's easy to steer it back to the center. So that was probably not good advice to give.

ROSS-NAZZAL: Did you get teased from anyone in the Astronaut Office when you got back?

COATS: Yeah. Sure. Well, the lesson learned is it's always better to look good. Wherever you stop you'd better make it on centerline. That's where the pictures are going to be of the Orbiter after you stop. I learned that lesson, so my next two missions—of course we landed on the runway at Edwards my first commander mission, and then the runway at KSC [NASA Kennedy Space Center, Florida], but I made sure I stopped right on centerline.

ROSS-NAZZAL: Did you do any interesting PR [public relations] trips after your flight? Anything notable other than hometown events?

COATS: Well, I probably told you my Barbara Mikulski story. Haven't I? Senator Mikulski.

ROSS-NAZZAL: I don't recall that one.

COATS: Every crew goes to [NASA] Headquarters [Washington, DC] and Capitol Hill for a week. We can't call it lobbying, so showing the flag, and we're in our flight suits. So we're up there visiting our congressmen from our hometowns and some of the Texas congressmen. We got this call when we were up there. Our escort said, "Representative," at the time, "Mikulski would like to see the crew."

She wanted to see the crew because Judy had graduated from the University of Maryland, got her PhD from the University of Maryland. Of course Hank says, "Sure." So we walked into her office. Before we could even introduce ourselves—or before Hank could introduce himself and the crew—she said, "You've got to understand. I'm not a fan of the space program. I think it's a total waste of money."

Henry goes, "Nice to meet you too." What do you say? So it's an awkward thing. She was very polite and very courteous but she felt like she had to be honest right up front, which is Barbara Mikulski.

Later on my next mission, I'm up there with my STS-29 crew, and we're seeing politicians. I got this message saying, "Senator Mikulski would like to see the crew." I'm going, "No way. Not a chance in hell. Over my dead body are we going to go see her."

They said, "We really can't say no. She's chairman of the NASA committee, very powerful. We just can't say no."

I'm going, "Oh, gee."

So we walk into her office. Before I said anything, I said, "Senator, I know you're not a fan of the space program."

She interrupted me with a big smile on her face and said, "I know what I told you last time, but it's Senator Mikulski now. I have [NASA] Goddard [Space Flight Center, Greenbelt, Maryland] in my district. I'm a huge fan of the space program." Laughing as she said it.

You got to admire her honesty. She really has been a good supporter of both human spaceflight and Goddard's work. She and Senator Kay Bailey Hutchison [Texas] have worked very closely together, even though they're on opposite ends of the political spectrum. So that was a memory of the postflight to tell you.

I remember we went out to Hughes [Space and Communications Company], who had made two of our satellites out in the Los Angeles [California] area. That's where Steve met his current wife. She was the hostess showing us around and representing Hughes, public relations office out there. I remember him asking. He said, "Do you think she's cute?"

I said, "I'm married. I can't comment. Not going to comment." But I said, "If I wasn't married I'd say yes."

He said, "Yeah me too." So one thing led to another. They've been married for a long time now. I can't think of any postflight—we had a lot of hometowners and that sort of thing.

Now when *Challenger* happened of course, Judy had been on *Challenger*. We as the 41D crew actually went to a lot of events in Judy's hometown in Akron [Ohio] and Cleveland [Ohio]. They brought us up there for a lot of memorial services and recognition services and that sort of thing. The crew obviously stayed close without Judy up there. But I can't remember any other postflight things other than the hometowners.

We went out to Palmdale and thanked the team out there for building a great vehicle.

ROSS-NAZZAL: Did you tell them about the Coke can?

COATS: No, we didn't tell them about the Coke can. Now we did debrief, because a lot of stuff floats up again on a first mission. Eventually the cabin fan will clean the air. You have to clean the filters regularly. But a lot of stuff floats up, and that's a problem with getting dust in your eyes and breathing it.

We complained about that or commented on it during the debrief. Apparently we must have been more vocal than the *Columbia* or the *Challenger*, which were the two previous Orbiters, had been after their first flights, because they really instituted some pretty strict measures inside the Orbiters while they were at KSC or being manufactured to keep them as clean as possible. I know on *Atlantis* and *Endeavour* the crews came back saying it really wasn't nearly as bad as what we'd seen. So I think we must have complained a little louder than anybody else.

ROSS-NAZZAL: I wanted to ask you too about getting your astronaut wings. Mike Mullane paints this great story of you being the hero and your wife being bestowed by the Admiral.

COATS: We went back to the Pentagon and the Navy made a big deal out of it. Of course I had Diane and Mike had Donna with us. I can't remember which one we did. I think we did the Navy first. Man, they had a big celebration, brought in a lot of guys I'd flown with in Vietnam. The Admiral was there. Just a really big event, and made a huge deal about pinning on my

astronaut wings. They made me feel really special and made Diane feel really special. They had cake and punch.

It was strange because I had called up the night before we left, to make sure what uniform. In the Navy you have summer whites, in winter you have your blues. There's a changeover date. We were going up in the fall, so I had somebody call and ask, "What uniform are you in?" Apparently the question, the way they asked it, or maybe I did, was "What uniform are you in right now?" They said one thing. Turned out the next day they were changing. So I'm in one uniform and everybody else there is in the other uniform. I'm in my blues and they're in whites. Which I thought was cute.

But the Navy made a big deal out of it. The Admiral and Vice Admiral just couldn't have been more gracious. Then we went over to the Air Force side. General Welch, who did not like the Shuttle—remember the Air Force was being forced to use the Shuttle and essentially put all their eggs in one basket, which later was embarrassing. We lost *Challenger* and now we had no way to get a spy satellite up in space. So General Welch was not a real fan of the Space Shuttle.

We went to his office, and the four of us, the two spouses and Mike and I, sat outside in his office with the door open watching him sit at his desk for maybe an hour. He was purposely keeping us waiting. And when he finally allowed us to come in, it was pretty obvious that he did not want us there. He was just downright rude. He had that reputation, he was a real SOB. He had that reputation, but I felt bad for Mike. He was embarrassed. Donna was absolutely humiliated. Mike had his Air Force uniform on, and I've got my Navy uniform on. On the Air Force side they're treating us like unwanted guests if you will. So he felt pretty bad about that and I did too.

I remember one of the aides to the general as we walked out apologized the best he could. That was like night and day. I was so proud of the Navy, and I know Mike was embarrassed about General Welch. But he got his Air Force astronaut wings pinned on. So that's what we went up there to do.

ROSS-NAZZAL: I understand you were a CapCom for three flights before you were assigned to STS-61H. Any recollections of being in mission control for those missions?

COATS: Well, I'll tell you, of course I was CapCom for STS-4 and 5, so I had Hank and Ken's mission. That was fun, because they had both gone to the Auburn University [Alabama]. So naturally since there's a big rivalry with Auburn and [University of] Alabama, we filled up their flight data file, their checklist with Alabama stuff, roll tide stuff. It may have been the only crew that had been flying together where the whole crew, both of them, went to one university. But I remember Ken occasionally calling down and going, "I'm going to get you." So that was a big memory.

I was also CapCom then later for the only Shuttle mission to lose an engine, [STS-]51F with [C.] Gordon Fullerton and Roy [D.] Bridges [Jr.]. Cleon Lacefield was the flight director. Cleon was an old friend. I think I told you the story, but he was a student of mine in the Navy, and I had to tell him to eject out of an airplane.

ROSS-NAZZAL: No.

COATS: When I came back from Vietnam, I went to what we call the Replacement Air Group Training Squadron to take pilots who'd just gotten their wings but now needed to learn to fly the fleet airplane. I was an instructor for about a year before I went back to Test Pilot School and became a test pilot. Cleon was a student, a Navy pilot who'd gotten his wings and came to the replacement air group. I took a detachment of planes and maintenance people and pilots, instructor pilots and student pilots, down to Yuma, Arizona from Lemoore, California, where we were homeported, down to Yuma for two weeks of bombing practice. They had lots of bombing ranges around Yuma, Arizona. There's a Marine Corps air station. It was really fun, because here I am a Navy lieutenant in charge of a bunch of airplanes and a bunch of people and a bunch of pilots.

Cleon was one of the students who came through. When you take out a group of three students, four airplanes, you have instructor leading the four flights. Remember, single seat airplanes, everybody's flying their solo airplane. Also had what we called T-28 airplanes, propeller airplanes that circle the target to keep an eye, not only spotting where the bombs hit, but to keep an eye on the planes, the students.

This was the first time they really dropped bombs from an airplane. Cleon rolled in and departed the airplane, rolled in a little too hard. The plane got into a flat spin. I had to yell at him to eject. He did, but he hurt his neck in the ejection. He actually landed right next to the fireball where the plane landed. So he couldn't fly ejection seat airplanes anymore because he had hurt his neck a little bit. He said, "Well, I'll get out of the Navy then." So he came to NASA and became a propulsion flight controller and then a flight director.

So here he was as a flight director and I'm a CapCom over there. Remember he'd been a booster flight controller. Lo and behold, they lost—Dick [Richard N.] Richards and I were the

two CapComs—they lost an engine going uphill. The only time we lost one due to bad sensors. Cleon was fantastic. He and Jenny [M.] Howard, who was the booster flight controller, were communicating just beautifully. It was a night launch, and here they'd lost an engine. They did what they call an abort to orbit. They really didn't have a place they could land like a transatlantic landing site. Plus it's at night. A second engine started having sensor problems, and the communication between Cleon and Jenny was really good. Jenny was like the ultimate professional, was able to quickly explain to Cleon, who quickly understood that it was just a sensor problem, and we didn't have to worry about an engine blowing up.

They aborted to orbit and accomplished the whole mission. Cleon did a fantastic job and so did Jenny Howard. So that was my big memory as a CapCom second time around.

ROSS-NAZZAL: A big moment.

COATS: Yeah, it's the only time we lost a main engine going uphill.

ROSS-NAZZAL: You also spent some time after *Challenger* working on a simulation as I understand it for STS-26. Something called STS-61MT, with the crew of what was supposed to be STS-61H, which became 29. Can you tell us about that simulation and what it was for?

COATS: Remember we were down for two and a half years between *Challenger* and Rick [Frederick H.] Hauck's flight [STS-26]. So they wanted to keep the crew trainers and instructors sharp. The crew goes through a long syllabus getting ready for a flight. We had just been through because not only had we flown one mission but we'd been through the syllabus, were ready to fly. I think we would have been the second or third mission to fly after *Challenger*. We

were going to launch out of Vandenberg [Air Force Base, California]. That's why it was 61H. We would have been the second mission out of Vandenberg if *Challenger* hadn't happened.

So when *Challenger* happened they said, "Well, we need a couple crews to go through the training syllabus again." More to keep the trainers sharp than anything else. Knowing full well that we'd have to go through it again when we were finally assigned to another mission. So that was what we did. I think Brewster [H. Shaw] did it with his crew, Brewster Shaw, and I did it. He had a classified syllabus and we had an unclassified syllabus to go through.

So we went through the whole training syllabus again, which was good. It's fun to get as good as you can get in a simulator. We had the opportunity to do that. Then we were assigned another mission and essentially went through that again. So essentially for three missions I went through the training syllabus five times. We'd flown a mission. We'd gone through the training syllabus. We were about ready to fly when *Challenger* happened. Then we went through just the exercise syllabus. Then we went through again to fly the second mission. Then we went through a fifth time to fly my last mission. So it's a lot of simulations if you will.

But you feel like you get pretty good in the simulator when you've done all those things. Kind of fun, but after my third mission I thought man, I don't know if I can go through that syllabus again. That was why they had the strange numbers in there. I know Brewster did exactly the same thing.

ROSS-NAZZAL: You must have been quite prepared for STS-29 by the time you were ready to launch.

COATS: Well, I hope so. What stuck out about that, other than the huge TDRSS satellite we deployed, which was a big, big satellite, was we had an experiment in the payload bay to check capillary action. A long tube that ran along the side of the payload bay with fluid in it, and the idea was that capillary action ought to move the fluid. The tube got bigger, and we thought the fluid would move naturally. But it didn't move, wasn't moving. So the result was we got to actually tumble the Shuttle end over end in space trying to get this fluid to move in the payload bay.

That's pretty cool. Usually your flying an attitude, usually it's head down so you can take pictures of the Earth. So we got to tumble it at two degrees a second, which is a pretty good rate, kind of cool, end over end. What was cool was—I can't remember who got the idea. Anyway, we got the idea. Hey, when you see the Earth going by quickly through the windows as you're turning over around, "Oh, there it goes, whoo, there it goes, whoo." We ought to set up the cameras, let's do that. So we got the cameras all set up to capture Florida. What was neat was we had the IMAX camera set up too, big 70-millimeter camera. We had thought about this in the crew. "Come on, let's set these things up in a hurry," because we spun for a while.

The funny part was the ground called up and said, "Oh, we wish we had thought of about setting up the cameras, because we had a great shot of Florida coming up."

We started laughing, saying, "Yeah we know, we're ready." So we took the film. If you see that *Blue Planet* movie, they've got a shot of Florida coming up. You see black and then you see the Earth horizon and you see Florida. You just pan down. What they did was actually take the movie film that we had, the 70-millimeter movie film, and run it backwards.

So it looks like instead of going west to east, which of course you are when you're in an orbit, it looks like you're going east to west. Now most people recognize the state of Florida,

and it doesn't matter. But anybody that knows anything about orbital mechanics knows you don't go the other way. You don't go west around the Earth, because the Earth is turning toward the east, and you need to use the Earth's rotation to help you get into orbit. But I thought that was kind of cute that they reversed that. And nobody noticed. I never heard anybody make a comment about, "Wow, you were going the other way, weren't you?" No, actually it was just a movie.

ROSS-NAZZAL: Any military rivalry on the crew? You're from the Navy. You had somebody from the Air Force, couple Marines.

COATS: Yeah, we joked, we'd tease each other unmercifully about that. Both Mike and Hank were Air Force. My dad was Air Force, I grew up on Air Force bases. So there was a fun rivalry, healthy rivalry. But Mike went to [United States Military Academy] West Point [New York] of course. So we had the Army-Navy rivalry. Hank had the Air Force as well. So it was a friendly rivalry which we still do. But it's a very friendly rivalry. We have to balance the selections. If one service gets more than another service we hear about it in astronaut selections. It usually works out pretty well. We know we need to pick equal numbers. When you rank them, they always come out that way. I think we get the best of the best from every service. It's nice.

I remember in our class the Marine Corps felt like they got stiffed. They had Jim [James F.] Buchli, who was a marine, but he was a naval flight officer, backseater. They didn't get any pilots selected. They had had a group of pilots that they very carefully groomed, had been grooming for some time. Sent them to graduate school and got them lots of flight time.

None of them were selected in 1978. The Marine Corps was really upset about it. So you notice two years later they selected Charlie [Charles F.] Bolden [Jr.] and Bryan [D.] O'Connor. So whenever one service feels like they get a little bit out of whack we'll hear about it.

ROSS-NAZZAL: Interesting. On STS-29 you had people from the '78 class and people from the '80 class. How did they meld well together?

COATS: Well, you don't really think about it that way. You see somebody and you don't think what class they're from. You think how good a job did they do and how is it going to be working with them. John [E.] Blaha. John is one of the hardest-working people I've ever seen. He can focus on something better than almost anybody else; amazing powers of concentration, which means he can be totally oblivious to other people. So he can be unintentionally inconsiderate if you will. He'll tell people, "Would you go fix my meal, would you go do this? I'm really busy here." At one point during the mission I remember I had Bob [Robert C.] Springer and Jim Buchli, both Marine Corps colonels, and they floated up to me during the mission and said, "Blaha has redefined MS."

I said, "What do you mean?"

"It no longer means mission specialist. It means manservant."

I laughed and said, "Yeah okay."

A day later they floated up to me and said, "We're going to kill Blaha."

I laughed and I said, "Okay, I'll play along." I said, "What are you going to do with the body?"

They said, “We’ll put it in the wet trash.”

I said, “Well, where are you going to put the wet trash if you’ve got John in the wet trash bag?”

They said, “We’ll put him in the airlock.”

I said, “Well, what if we have to go out on an EVA [Extravehicular Activity]?”

They both smiled and said, “So? Obviously we’ll just float him out.” They’re doing this all with a straight face, dry sense of humor.

I said, “I’ll tell you what. It’s only a few more days. If you’ll put up with John—because you know it’s unintentional, he doesn’t mean ill at all, he’s just totally focused on what he’s doing—when we get back I’ll help you.” All this jokingly.

So we landed. Of course landed out at Edwards and flew back here. Nice welcoming ceremony out at Ellington [Field, Houston]. So after the festivities are done I’m thinking, “Oh, we’re going to go home and celebrate.” And we’re walking back, and Bob and Jim walked up and said, “Okay let’s go.”

I said, “What do you mean?”

They said, “We’re going to kill Blaha.”

I said, “Yeah okay, I changed my mind. I can’t kill Blaha.”

John is one of the hardest-working guys I’ve ever seen. He just doesn’t stop to think how other people around him—he’s just not terribly clued in. His people skills were a little rusty I guess you could say.

ROSS-NAZZAL: When we interviewed him he said he was really disappointed that Anna [L.] Fisher had been replaced on the crew, that it had really changed the crew dynamic. What were your thoughts?

COATS: I tell you. If I have a regret, it's probably agreeing to replace Anna on the crew. I think [Daniel C.] Brandenstein—and Steve Hawley was the deputy at the time—came to me. Bill [William F.] Fisher, Anna's husband, simply wasn't coming to work. He was working as a doctor. Yet we were paying him, a big civil servant salary. Dan was pretty upset. Dan was chief of the office by then and was pretty upset about that. Anna wasn't the hardest-working member of the Astronaut Office but she was okay. But she had the reputation of not being as dedicated if you will as other people. Bill was the extreme and she was not that extreme. But they wanted to replace Anna on the crew, and I agonized about that for a long time, and I finally agreed to do it. It was probably a bad decision on my part. They were pretty determined. I was unhappy with Bill Fisher too, but I think we punished Anna, which really wasn't fair to Bill.

So John was probably right. That was a mistake to take her off the crew. Got Jim in place, which was good. But if I had a regret that's probably my regret. I agreed to that. I had to agree to it, they wouldn't have done it if I hadn't agreed.

ROSS-NAZZAL: Did you have a chance as a commander to pick who was going to initially be on the crew? Or was it pretty much you had been assigned the crew?

COATS: They assigned the whole crew. I was Acting Chief of the Astronaut Office for a while in 1989, '90 before I was assigned to STS-39, so in that case I did have an input to my last crew

assignment. It was Dan's call even though he was off training for a mission. He was still technically Chief of the Astronaut Office and I was Acting. But he wanted to do the crew assignments. I did have an input. He wanted to fly certain people in the crew, and I said, "Okay but I want certain people as well." We had a lot of rookies. I had Guy [Guion S.] Bluford of course who was very experienced, but the other five were all rookies, and it was a very complicated flight. So I got to have an input on who I wanted to make the crew as strong as I could.

That's unusual. Usually the Chief of the Astronaut Office will tell you who your crew is going to be.

ROSS-NAZZAL: Talk to us about the role of the commander. Pam [Pamela A.] Melroy was telling us so many people think the commander's job really only is to safely land the Orbiter, and there's so much more to it than that, there's working with MOD [Mission Operations Directorate], working with different offices, making sure the crew comes home safely, meeting all the goals. Talk about that. You were crew commander for two flights.

COATS: Well, you are obviously responsible for the crew. You're the interface with everybody outside. If you have a problem with training, if you have a problem with MOD, with the Mission Control Center, the crew commander is the one that has to talk about it. I remember a trivial thing, but on our first mission we were on training, and the last thing a pilot wants to do, a PLT, is tie a shorted bus. We had three main buses, and if you tie a shorted bus you're bringing a second one down and you lose the Orbiter. So recognizing a short is really important. Tying a shorted bus is a black mark against the crew. We had a simulation and had a short. I said to

Hank, "I think it's a short." The ground was telling us, "It's not a short, go ahead and tie it." The simulation supervisor puts in the malfunctions.

The ground controller has to recognize it just like the crew has got to recognize it and coordinate a response. I told Hank I was pretty sure it was a short and I didn't want to tie it. The ground was telling us it wasn't a short, go ahead and tie. I turned to Hank and I said, "What do we do? You're the commander."

Hank said, "Well, the ground is pretty confident. Go ahead and tie it." Well, I tied it, and it was a shorted bus and we crashed and everything.

Well, all hell broke loose in the control center. Flight directors, lots of flight directors came over to apologize repeatedly. It was a big deal. Much bigger deal than I—to us it was "Okay, big deal, made a mistake, we learn." They apologized for days after that. They thought they'd lost the confidence of the crew. Well, they hadn't. It was simply a mistake. We'd all been CapComs. We'd worked with the folks over there.

But Henry is the one that kept having to say, "It's okay, it's okay, it's not a big deal, let it go, let it go for heaven's sake." Gary Coen was the flight director at the time. Gary just couldn't get over it. Let us down. We said, "No, it's just a silly mistake. Don't worry about it." But the commander has to be the interface there and speaks for the crew obviously.

Now you also have responsibility, a huge sense of responsibility as crew commander, for the crew. You want to bring them home safely. When I was a crew commander, I made sure we had flowers delivered to each of the other spouses while we were up on orbit. I had a note saying, "I'll bring them home safely." That meant a lot to me. But remember we had the pad abort. Then we'd had the *Challenger* happen, and I saw what Diane went through and how hard

it was on her. So I wanted the spouses to know that if there was any way possible I was going to make sure their spouses got home safely.

It's a huge sense of responsibility. I've had nightmares. Because I know for about 30 seconds what Rick [D.] Husband was going through on *Columbia* [STS-107 accident] when he could not regain control, and 30 seconds is a long time. Think about that. Time it. When you know you're going to lose not only your life but the lives of your crew and you get to think about it. I know he was fighting madly trying to gain control and he had no hope of doing so. But that 30 seconds has given me nightmares ever since, because I can picture it. That's exactly what you worry about as a crew commander. Not being able to pull it out if you will.

That's a huge responsibility that you feel. You feel responsibility to accomplish the mission certainly. You want NASA to look good. You want to represent the space program as well as you can. But primarily you want to make sure your crew gets home safely. That's a big deal for any crew commander.

ROSS-NAZZAL: Your first mission as commander was pretty short, a little less than five days. Did you guys have any leisure time in orbit? Or were you pretty much working night and day trying to get everything done?

COATS: We were working pretty hard. It was a short mission. Primarily it was to deploy the TDRSS satellite. Then we had the capillary test and a few other minor things, so it was a pretty short mission. We really didn't have any problems with the Orbiter to speak of. It was a fairly clean mission. First and last missions had more Orbiter problems to deal with and payload problems. The crew was very professional, after they got used to dealing with John. You've got

to put that in context. Everybody knew John was just incredibly focused on what he was doing. He certainly didn't mean to be inconsiderate but he wanted to accomplish as much as possible on that mission too. He just had a different way of doing it than other people. But Buchli was fantastic. Of course he was experienced. He was the other veteran on the crew.

John, Bob and Jim were all first time rookies. Both [STS-]29 and 39, I could turn to Buchli or turn to Guy Bluford and say, "Can you take care of this? Make sure it gets done?" They would go do it. They didn't have to ask how or anything like that. They'd just go make it happen. That was really a blessing.

Plus when you first get up on orbit on the first flight, usually you feel lousy for a day. Not all crewmen. The majority feel kind of lousy. I did. But on your second and third flight you get up there and you say, "Oh, been there before," and you pick up right where you left off, there's no adaptation period like you have on your first mission. So it's nice to have a couple veterans on a crew. First mission it was just Hank, all we had, the rest of us were rookies. But I don't think Mullane had any problem at all. In fact I'm not sure Judy or Steve had much of a problem. I was sicker than anybody on the crew for that first day. I just tried to stay busy until it went away.

But it was nice to have a couple of veterans that you knew were going to feel good as soon as they got up there. Jim did great and Guy Bluford did great. The crews actually didn't really have any serious problems, fortunately, on either 29 and 39.

It was nice having [James P.] Bagian along as a medical doctor. So that was a pretty uneventful straightforward flight, STS-29.

ROSS-NAZZAL: Afterwards, you were asked, as you pointed out, to be the Acting Chief of the Astronaut Office by Dan Brandenstein so he could go off and work on a mission. What sort of issues were you working in the office? Things like personnel or budget, training?

COATS: Well, when I came in I put my foot down and said, "I'm not signing Bill Fisher's time card." Dan had been signing it. I said, "He's not working 40 hours a week. I'm not signing it that he is."

Don [Donald R.] Puddy was the Director of Flight Crew Operations. He said, "Somebody's got to sign it."

I said, "It ain't going to be me. That's fraudulent. You can sign it if you'd like."

He said, "Well, we got to do something about that."

So I actually sat down with Don. We got together with the Center Director, Aaron Cohen at the time, and said, "I'm going to confront Bill, and say, 'Either you give up your real job and come back and be an astronaut or we're going to ask you to resign.'" And I said, "Now Bill will think we're bluffing." So we drafted a letter for Aaron Cohen to sign essentially saying, "If you want to call our bluff and threaten to go to the press, we'll go to the press as well. Is that really what you want to see?"

Aaron wouldn't have done that. He said, "I'm not really going to do this."

I said, "Okay but sign the letter anyway saying you would." Don helped me, backed me up, and Aaron Cohen backed me up, bless his heart. So I called Bill in and said, "I'm not signing your time card, nobody else is either." Bill essentially said we were bluffing. So I pulled out Aaron Cohen's letter. I got his attention. So he did resign. That wasn't a whole lot of fun, as head of the Astronaut Office.

It was fun being on the selection panel in 1990, because I was on the selection panel for selecting Ellen Ochoa. I think that was a very fine class we had. Ellen and Nancy [J.] Currie and several other members of that class did quite well. So I'm really proud. Eileen [M.] Collins. We'd been looking for the first female pilot astronaut for some time and almost selected one from the Navy and almost selected one from the Air Force and didn't. Then later both of them had problems in the Navy and Air Force. Remember, it's not fair and it's not right, but the first person to break a barrier is under tremendous pressure, and has to be somebody that almost can't fail. Once the first person gets through, the ice is broken and it doesn't matter. You can pick as many of those as you want, and if they fail nobody cares. If the first one fails, everybody talks.

So we really needed the first female pilot to be somebody who was a slam dunk if you will. So Eileen, even though she was at test pilot school and was a pilot, the Air Force wouldn't forward her as a pilot. Their rule was you had to have finished test pilot school before they would send you forward as a pilot. Our rule was as long as you're done with test pilot school by the time you report, that's fine. A little bit different timing. We actually didn't have a rule saying you have to be a test pilot. It just really helps.

She actually was forwarded as a mission specialist. She came to the selection board as a mission specialist candidate. When she interviewed she just knocked our socks off. Incredibly poised. When she walked in, we knew she was a pilot and had flown C-141s with a crew, so was good with a crew. When she walked out of the room I remember Mary [L.] Cleave was on the board too, and there was absolute quiet in the room when her interview was over. Everybody's thinking. Finally Mary was the one that spoke up and said, "Okay, if nobody else will say it I'll say it. Why don't we consider her as a pilot?" The room erupted. Just erupted. Everybody talking at once.

After a lot of discussion we agreed. Okay, let's go research her background. If she's going to be selected as a candidate for the first woman pilot astronaut, she can't fail, she can't flunk out of test pilot school, which she was in the middle of. I swear we talked to her kindergarten teacher. We talked to everybody she'd ever known, met, heard of, whatever. Everybody we talked to assured us that she couldn't fail. She'd be great. So it was fun to call her and say, "Well, unfortunately you didn't get selected as a mission specialist. Would you like to be a pilot?" That was kind of fun.

She did great. Once the ice is broken, you got Pam Melroy and some others that have done really well. I understand we've got some good candidates in this class we're interviewing now.

We had Nancy Currie in the selection. I got to call her. She had been a flight engineer out here at Ellington that I already knew of course, because we were flying the STA [Shuttle Training Aircraft], and she was an STA flight engineer. So I called her and the timing was bad. She had just had a call from her first husband asking for a divorce. So I'm calling her and she's crying. I'm thinking, "What did I say? All I said was hello." She said later I kind of made her day, made it a much better day asking her to be an astronaut. Unfortunately she married and was very happily married, second marriage, and he died. That's pretty tragic. But she was a pretty special lady I think. That was a pretty good class. We did good. I'll pat myself on the back.

ROSS-NAZZAL: There are a lot of notable people from that class. One of the things I noticed. When you were in that position there were a lot of DoD [Department of Defense] flights. Of course NASA was trying to finish up all those missions. What was your role in working with DoD and getting all those classified flights through?

COATS: Well, it was really not a big deal doing DoD flights. There were still people in the Department of Defense like General Welch, especially after *Challenger*, who were very bitter that they'd been forced to put all their eggs in one NASA Shuttle basket. Welch was gone by then, but there were still a lot of folks that resented NASA. Remember, what they had to do then was go develop the Titan IVB program to have an alternative to the Shuttle. Their feeling was in DoD that Lockheed Martin which built the Titan IVB stuck it to them as far as cost. Having worked for Lockheed Martin, they did. They had them over a barrel.

Now they needed a capability very quickly, so there's two sides to the story of course. It's funny because I ran into General Welch years later when I was working for Lockheed Martin. When he found out I was an astronaut working for Lockheed Martin, he felt like I personally had screwed him two ways: number one with the Shuttle and number two with the Titan IVB. So he wasn't a terribly nice man to start with, but a very influential four-star general. So I got to have my ears burned off a little bit by him.

But most of the people you work with in DoD or elsewhere are really dedicated, hardworking people that just want to get the job done, and are looking for help to get the job done. I didn't really detect any issues. Frequently the DoD would come to us asking for some help. They'd like to get maybe a little payload on a mission or whatever. A classified payload that most people never heard about. Things like that. I think we worked pretty well with them. I didn't really have any issues with them. You'd have to look at crew assignments to make sure you had military people on the crews to handle things.

About 40 percent of the office was military, even a little more, so it wasn't usually a problem. We almost always had a military person, or somebody with a military background.

Might be a civilian, but they'd been military. But other than that it wasn't really something to worry a whole lot about.

ROSS-NAZZAL: Any notable missions that you recall, or any assignments that really stand out? I understand as Chief of the Astronaut Office you go down for launch, and you're there for landing.

COATS: Yeah. You get to fly the weather flights for launch and then the weather flights for landing. It was fun. When we were landing out at Edwards and I was the weather pilot, you take off in the T-38 first and go check the weather out early, early. If you're landing about 6:30, you take off about 4:00 a.m. to check the weather. When you take off at 4:00 a.m., not a lot of other airplanes in the sky. I remember taking off and talking to the air traffic controller. I said, "I'd like clearance up to 50,000 feet."

He said, "You're cleared as far as you want to go. It's just you and me. You can go anywhere you want, do anything."

I said, "Oh good. Can I do a loop at night over Los Angeles?"

He said, "You betcha." There was nobody coming in, which is unusual for Los Angeles even at that time. But he said, "I'm the only one on duty down here." That's kind of fun because you can go do anything you want. Especially on a clear night and there's no weather to check on. It's absolutely unlimited visibility. That's kind of fun.

You do the weather. Then you come back and land. Then you take off on the Shuttle Training Aircraft, and you're checking not only the weather, but you're checking the winds and giving information to the Shuttle crew that'll soon be landing about what they should expect

when they land, and that's important too. That's a good memory. That was kind of fun being in a high performance jet and you're the only one flying. Go anywhere you want, do anything you want.

ROSS-NAZZAL: You had been in the office for more than a decade by the time you became Acting Chief. How had the office changed?

COATS: Well, you got to remember *Challenger* shook things up obviously. John [W.] Young had been chief of the office. George had been flight crew operations. John had a really rough time after *Challenger*. He became obsessed with we can't fly because it's not safe attitude. Now technically he's right. If you stay on the ground you can be safe, but it's not what they hired us to do. It's not why they spend billions of dollars on the space program, to sit on the ground. The idea is to make it as safe as we can afford to make it, but let's go accomplish the mission. So we had some pretty tough discussions with John.

The commanders actually got together. At one point he even made the statement to a group of commanders that, "I'm the only one that cares about safety." Now that's not what you say to a bunch of not only experienced astronauts but a bunch of military pilots. Most of us had lost a lot of friends in Vietnam or in testing airplanes. So saying we don't care about safety is not the right thing to say.

Surprisingly Vance [D.] Brand, who was usually pretty quiet, was the one who took the lead and said, "Oh no." Had a little bit of a mini revolt if you will against John.

About that time Dick [Richard H.] Truly became [NASA] Administrator. He very quickly replaced both John and George Abbey. Of course Dick had flown with Dan, so he put

Dan in as Chief of the Astronaut Office and Don Puddy as Flight Crew Operations. So it was different personalities, and before *Challenger* the emphasis had been from NASA management almost top to bottom was okay, the astronauts are here to go fly. They're not here to talk, they're not here to manage, they're here to fly. So keep a lid on them. That was George's charge I think and John's charge. Keep a lid on the astronauts. So communications didn't flow up and down very well. Now neither George nor John were the world's greatest communicators anyway.

Afterwards when Dan came in and Don Puddy came in, I think we felt—and Don was pretty good about having commanders' meetings. Let's talk about an issue. I want to hear everybody's inputs. So we felt like we had a voice that we had never had before, had an input if you will.

Obviously Dick Truly now became the NASA Administrator, and they started putting astronauts in other management positions that they'd never been in before. Deke [Donald K.] Slayton had been essentially Chief of the Astronaut Office, FCOD combined, but that was it. You didn't have astronauts in management positions. So then you start putting them in management positions.

People saw actually they could have a career after they wanted them to quit flying if they wanted to stay involved in the space program. I think that was good. We got a whole long list of astronauts that are in management positions, starting with the Administrator. I think that's a good thing. I think we work very hard to have a pretty rigorous selection process and get the best people we possibly can. It'd be nice to use them in other positions if they're so inclined. There are people who don't want to be managers. We have scientist astronauts who want to be scientists or professors or teachers or whatever. We have pilots who just want to fly forever.

But if you want to get into management, we need to give them an opportunity. I think we've been doing that pretty well.

So things changed that way significantly I think after *Challenger*. Now remember I was gone. After my third flight I left, in '91, so I was gone for almost 15 years. I really can't tell you what it was like during those 15 years, or leading up to *Columbia*. I really wasn't working much with JSC. I did a lot of work with [NASA] Marshall [Space Flight Center, Huntsville, Alabama] and Goddard and Jet Propulsion Laboratory [Pasadena, California] but not a whole lot with JSC here. So my experience is in talking with people, the pendulum swings back and forth. It did after the Apollo fire, it did after *Challenger*, it did after *Columbia*. After one of those tragedies, boy, the emphasis is on safety. Let's throw a lot of money at it, make it as safe as we can within the budget we've got. We have more budget. But then I don't know the right word, but complacency sets in. We're operating okay, we're doing okay. The budget is tight, so let's take a little money away from the safety emphasis. I've seen that happen several times. What we're trying to do now, and have been for several years, is make sure we don't get complacent.

Now it may be inevitable. It may just be human nature. I don't know. I hope not. I hope we're learning from the past. One of the things that I felt very bad about at the time was we weren't allowed to write a report on the *Challenger* accident.

ROSS-NAZZAL: The Astronaut Office?

COATS: NASA. None of us. George wouldn't let it happen. Now in all fairness, George was—I was down at the Cape. I flew down two hours after the accident and stayed down there for about four months. I was working recovering the debris. There was a pack of wolves out there.

The media was just beside themselves trying to get any information they could. It was really bad. They didn't believe anything we told them. "We know you recovered bodies. Who'd you recover?"

"Well, actually we haven't recovered bodies."

"Well, you're lying."

Wow, I haven't been accused of lying before. George at one point told us to burn all of our notes. Everything, because the judge was going to tell us to turn everything over to the media. So you can see where George was coming from. He was under attack if you will. Now most of us had been military test pilots, and had learned. You learn everything from an accident that you possibly can because you want to prevent the next accident. How do you make it safer? How do you improve the safety record, if you don't learn every lesson you possibly can?

Now the airliner safety record was horrendous. Back in the '60s, it wasn't unusual to have an airliner crash once or twice a year. Everybody killed. Everybody'd go, "Oh, that's horrible." Then they kept flying. The accident rate was horrendous. They had a policy then too. Let's report near misses. You can do it anonymously. That's how you improve your safety record. Learn everything you possibly can about accidents and about near misses. So pilots anonymously would say, "Boy, I screwed up here, and here's how to prevent that in the future." The safety record has just been improving dramatically. The same thing in the military despite the dangerous flying they do. The accident record has really improved.

So we were big believers in you study it, and you write a report that everybody sees, you don't hide it. Except for medical information and privacy issues, you publish everything. It would have been nice before the Apollo fire to know that the Russians had had a similar fire several years before that that killed cosmonauts. It would have been nice to know that.

Well, George said, "No, we're not going to write a report, ain't going to happen."

So when I came back to this job, I said, "Where is the *Columbia* report?" They were working on it. Pam Melroy just did a fantastic job, she and Nigel Packham led that effort. Wayne Hale, the Shuttle Program Manager, also put his heart and soul into it, backed it up. They came out I think with just a fantastic report. I'm really proud of that team. Mike [Michael D.] Griffin helped us get it released and published. There were people saying, "No, no, you don't want to do that."

I'm pretty proud of that. That was the right thing to do. I can understand why after *Challenger* they didn't want to do that, but I think that was the right thing to do. We owe it to future astronauts to learn everything we can from our accidents and near misses. So I worry about complacency setting in again. Now we depend on the Russians to launch our people. Eventually we'll be paying the commercial companies to launch them. Eventually after that we'll hopefully have our own spaceship again. But things have changed. A lot has changed in 34 years, wow, almost 35.

ROSS-NAZZAL: It's amazing. Well, I think that's probably a good place for us to stop today.

[End of interview]