

INTERVIEW OF
MR. PHIL CULBERTSON
KENNEDY SPACE CENTER

APRIL 1, 2004

BY

DR. ORVILLE BUTLER

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DR. ORVILLE BUTLER: Okay, we're here in the archives at the Kennedy Space Center. I'm Dr. Orville Butler and we're talking this afternoon with Phil Culbertson.

I guess I'd like to begin with background information. Tell us a little bit about where you grew up, went to school and how you got into NASA.

MR. PHIL CULBERTSON: Well, I'll try that. I was born in (inaudible -Comdon?) Washington in 1925, where my Father was in the Department of Chemistry for Washington State College. I remained there until I got into high school, and was getting ready to go on – but about that time, we were in the war and I was obviously gonna be drafted. I would turn 18 in the summer that I graduated from high school.

So I went up in the preceding Fall to the registrar at Washington State College to see if I could enroll in college without having graduated from high school. We lived across the street. It was very simple, and he said, well, I don't know that there's any rule that you can't. So I enrolled, went in college in the morning and high school in the afternoon. Graduated from high school and would have been, it was early in the Summer then, I signed up for a program in the Navy to go into flight – to be a pilot.

I won't go into all the complicated details, but when I got into the

program, by the time I had my uniform on, they said that we were going to be sent to two (2) years of college. Half of us were gonna be spending two (2) years in college and other half would go to flight training. Then after two (2) years the two (2) groups would switch, and to my disappointment, I got the college training for two (2) years.

They sent me to Millsap's College which had a program for – this is in Jackson, Mississippi – had a program for pilot training. Had a program set up by the Navy for them to give us the two (2) years. After the end of those two (2) years, by that time the war was coming down pretty fast, and they said we could go on and go into flight training, but by that time it was possible that we would be grounded or taken out of the flight training program for taxing wrong.

Said, if we wanted to go into college some place and stay in the Navy, that would be fine. I asked them, what college I could go to and they said, well, the nearest technical school was Georgia Tech. So I elected to go to Georgia Tech. So the Navy sent me to Georgia Tech for two (2) years.

By that time, the war was over and they said we could stay in the Navy or we could get out of the Navy, and I elected to stay in the Navy for, at least, one (1) year. And that's how I started to get into the missile business, sort of. I was sent to Mojave Naval Air Station in the center of California, where they were developing drones and testing drones. I stayed there for a year.

I then retired from the Navy, and decided that I wanted to be an aeronautical engineer by that time, and the nearest school was California Tech. Cal Tech. So I was driving back home and I just – this is in – it was early part of Summer –

I stopped at Cal Tech and they said, well, it's too late for the next Fall, and what part of aeronautical engineering would you like to get into. I told them that I was interested in aerodynamics and they said, well, the best school for aerodynamics in the country was at the University of Michigan.

So it turned out I was familiar with Ann Arbor because when I was six (6) my Dad had gone to Ann Arbor to get his doctorate in chemistry and so I had the first grade in Ann Arbor and then I arrived in Ann Arbor, as a student. Working there I got involved with a supersonic wind tunnel that we had on the campus – a very small one. It was about 10 by 14 square inches, but by then, this was, well, I was 21, I guess, so it would have been 1945 or 1946, around in there.

There were very huge super sonic wind tunnels in the country, but we were doing some testing on drones that we're being developed. Most of the testing that we were doing was on services that supported companies that they had. I was working the same time I was going to college.

Got my degree and continued to work for awhile and the chief aeronautical engineer from what was then, in San Diego, I can't think of the name of the company. My memory is failing me. Anyway, and the chief of aerodynamics there, was touring the country where there were super sonic tunnels, because they were hoping that General Dynamics, that was the company at the time – the overall company.

Convair was the local company, but Convair was a part of General Dynamics.

So, General Dynamics was hoping to build a super sonic wind tunnel there in San Diego, and so the chief of aeronautics was trying to get familiar, somewhat, with super sonic tunnels. He asked me if I'd be interested in coming out there and being their assistant to try and get the super sonic wind tunnels started. I thought it over for awhile and decided that yeah, that was a good thing to do.

Went to California and San Diego and worked with the people who were thinking about the super sonic wind tunnel, and we got to the point that the company did decide it was gonna build this. I got started as kind of a senior scientist working on the development of the tunnel.

After a couple of years, I decided that I would like to go back to Ann Arbor and get my PhD in Aeronautical Engineering. We had two (2) children by that time. After a little while at aerodynamics, I mean at the University of Michigan, in Ann Arbor, before I enrolled, I realized that I didn't have enough money to survive a year and I better work for a year and save a little money.

Decided I would go back. I gave up on the PhD. Went back to San Diego and was assigned at General Dynamics in San Diego – assigned to the Atlas missile program and my job was to. I'll have to say this. We were building launch vehicles, as well as ballistic missiles and the ballistic missiles were all of the same configuration, where it was necessary to do something particular or its launch vehicle for a spacecraft.

It was my responsibility to find out all the things we would have to do to the Atlas to satisfy the customer, who was the spacecraft on the top end. Make sure that the vehicle had come off the line was properly adjusted to that. I got the early

ones that I was working on for the Apollo program. I'm sorry, I jumped – it was the Mercury Program.

I started working with NASA to make sure that they were satisfied that we were doing the right thing and when we delivered a vehicle down at Florida, I was responsible to make sure that we were covering it from the San Diego standpoint, as well as we should.

I got to be a good friend of John Glenn's, and a few other people that we all know about. I stayed in that responsibility for about three (3) years and by that time I was hooked on NASA. I left San Diego and went to Washington, D.C. and signed up with NASA and spent the next twenty years in NASA. Twenty-something years, I guess.

DR. ORVILLE BUTLER: So, what year was it that you made that change?

MR. PHIL CULBERTSON: Let's see. I have to look up – when did John fly? Been about two (2) years after that. Yeah, a couple of years after that. It would have been about '75, but I'd have to look at up, and I'll give you a call and tell you when it actually was. If that's all right?

DR. ORVILLE BUTLER: Sure. Now John flew in the early 60's.

MR. PHIL CULBERTSON: Whenever it was. I was there. I'd been there for at least a year, but I will look it up. And I worked my way up gradually after, in a number of assignments. I started - well I don't need to get through all the details.

I was involved in the Shuttle program as the Deputy Associate Administrator who was responsible for the Shuttle, and I started the Space Station Program. I was the Associate Administrator for the Space Station Program and then when Jim Beggs (phonetic) was falsely charged by the government for doing some bad work, I was made NASA General Manager, as a Number Two man in the agency.

So that's probably more than you wanted to know.

DR. ORVILLE BUTLER: During this time how much interaction did you have with the people out here at the Kennedy Space Center?

MR. PHIL CULBERTSON: Oh, a lot.

DR. ORVILLE BUTLER: Who were some of the people you were working with and what were some of the issues you were having to address down here?

MR. PHIL CULBERTSON: Well, I came down for most of the launches – the manned launches took place down here. Like, for instance, when we lost the Challenger, I was the one who put together, immediately after the launch, put together the group who would initiate the investigation. I wasn't on that Board, but as the senior person in NASA who was here. I felt it my responsibility, and early in the afternoon we met for the first time. The launch was in the morning.

I was here for all the Mercury launches, earlier before than that, but that was before I was with NASA. I don't know if you're familiar with the Skylab program or not. I guess I would say that I was as close to the Manager of the Skylab program as there really was. It was kind of a put together thing.

After I became, about the time I became the Manager of the Space Station Program, I would have a lot of consultation with the people down here, but no more than I did with the other Centers that were very much involved with in the program.

The only time I had an office was when, down here, when we did the study, which you're gonna talk to me about later. I was here for three (3) months on that, and so I did have an office here. Other than that, it would just be a relatively senior person in all the programs, who left Washington, D.C. and came down and was tolerated by the people at the Center, who didn't really care whether I got there or not. (laughter)

Just a little bit like that - but there is a feeling like that. The Center Director thinks he knows what the hell is going on and how to do it. When somebody from headquarters comes, a fairly senior person, he's got to listen to him. But whether or not he does anything that is said, is up to himself, so. That's pretty healthy the way it is, it really is. Because he knows that - I would know that I could not direct people down here, what to do.

I could tell the Center Director what to do, and then he would use a certain amount of judgment. So there was respect for the power that we had and therefore, we were effective. Whether or not they ever respected any intelligence on our part, is questionable.

DR. ORVILLE BUTLER: Can you give us a couple of examples where that tension between Headquarters and the Center, came to the forefront?

MR. PHIL CULBERTSON: Well, I don't know that I can, because. Well, let's say that I never came down here and told them to do something and it was refused. I accepted the fact that they could do about ninety percent (90%) of what I said.

I think there was a good relationship between the Center Directors and Headquarters. I sort of jest when I talk about this tension, but I think if I were a Center Director I'd figure I was smarter about what I was doing than somebody sitting in an office in Washington.

DR. ORVILLE BUTLER: Sure, and part of his job is to protect the interest of the Center.

MR. PHIL CULBERTSON: Yes.

DR. ORVILLE BUTLER: And the interest of the Center sometimes differs from the interest, as perceived, up at Headquarters?

MR. PHIL CULBERTSON: Yes, but that wasn't the dominate factor, but it was certainly true. I guess once in awhile, they wouldn't feel the pressure that we got when we go the Congress, and be trying to get more money, or more this or more that. That, we had to do. They could not do that. They were not – occasionally a Center Director would be called by Congress, but not too often.

Our job was as much to manage the relationship between NASA and the Federal Government, as it was between NASA Headquarters and the Center Directors and the Centers. So I think, I would say that it was very seldom that I felt they were just saying, go to Hell, Culbertson, you know?

I really think that's true, so I can't give you an example other than to say there was obviously, once in a while, some differences of opinion. I expected that to happen occasionally, but it didn't happen very often and I was pretty careful how I talked to the Center Directors, because in most case, well, they certainly knew the technical problems more than I did.

In some cases, I was putting some pressure on them because of the pressure we were getting out of Congress, as things seemed to be going wrong, you know, there was that kind of thing. They understood that too. So, I can't identify any individual thing where I felt that there was real, honest to God, stress, so much that that it bothered me.

DR. ORVILLE BUTLER: Let me raise one (1) issue where I don't think there was stress in the sense of they were saying, ARH Headquarters, but where certainly the Center had a very difference prospective than Headquarters did. In the development of the Shuttle - the Shuttle was portrayed to Congress as being economical based upon about 40 flights a year and a 160 hour turn around time.

Kennedy analysis said that the 160 hour turn around time was impossible, and subsequently we found out it probably was. What do you remember about the interaction between the people at Kennedy, with how to handle turn around by you and others at Headquarters?

MR. PHIL CULBERTSON: I don't recall anything about that particular situation, except that I was aware, well, I was in (inaudible) shell program. I

was certainly aware that they felt it was not possible to do what we were targeting for, and I felt certain, at the time, that we would not get down to 160 hours.

But I felt unless we kept talking about 160 hours, it was gonna be 360 hours. I mean, I felt Washington had to put some pressure on the Center to some extent, and probably there were times when I stated that position, that requirement or desirement, as the very best.

I think the pressure that we put on 'em probably did make a difference in what they did, because they knew we were being pressed by Congress to do that kind of thing, because we had said it. I was aware that we would never get – I mean I was pretty sure that the Centers were right – that they could never get it down to 160, but we had said some other things, along the road, that we were optimistic, and perhaps recognized by all of us, who said it, that they were optimistic.

Trying to think if I really can pull any other of those – that specific time out. No, I can't give an example, a specific example of that at all, other than to recognize that there was a difference of opinion, and that I knew that we were asking them to do something that they were not going to be able to do.

DR. ORVILLE BUTLER: Very good. Let me ask you a different type of question. When Kennedy was formed, they were, in some respect, the cultures that developed here were divergent. You had one (1) group that came out of – originally out of Langley and then ended up at Johnson, working down here primarily on the spacecraft – the nose cones. They were sometimes down here as the nose cones people.

Then you had another group that largely came out of Marshall and the von Braun tradition, that were the launch vehicle people. From your prospective at Headquarters, first how did you deal with those diverse cultures, and said you – was that something that ever became a major concern?

MR. PHIL CULBERTSON: Trying to think – I think there was not a major concern in the respect that you're thinking about. There were some people here who were unhappy with von Braun. In part, I think, some of that came from the fact that he was a German, and there was resentment that we had taken a Nazi, brought a Nazi here, and that he was showing us how to do things.

There was also respect for von Braun because he was doing the job pretty damn well. There was always, you know, as Kennedy grew, and had the people who had supported the vehicle itself, and the engine and the tank, there was – there was always a certain amount of friction between the people at Kennedy, after being here for a year thought they knew as much about it, as the Center that had developed it, knew.

There was always a little bit of unhappiness when von Braun would send people down from Huntsville, or Gilruth would send some people from Houston, as they always did. I mean there was always people from the Centers to do that.

The tank wasn't that much involved in this kind of problem because it was pretty inert kind of vehicle, and it was the engine and the vehicles themselves that had the most technical support come out of the Centers.

I think if there was any – there was a certain amount of unhappiness between the Kennedy people and the people coming out of Houston, because there

was an arrogance from the Johnson people. Now after all, they had designed the vehicle.

DR. ORVILLE BUTLER: This is the Shuttle?

MR. PHIL CULBERTSON: Yes. And people at Kennedy had had most of the experience with the vehicle, so there never was a Shuttle in Houston itself, which is not the case, there were engines at Huntsville. Well, and Gilruth, who was the Center Director at Houston, had come out of the NACA, and he was known very well and respected and he knew a lot of the people who also migrate down here.

So I think at the Gilruth level, there had to be some extra respect of the Kennedy people with Gilruth because of Gilruth, but there was a resentment. I have always felt there was some resentment between them from people here who had been working on the vehicle for six (6) months getting ready for launch, and the Houston people came over and told them how to do it. That was not appreciated very much.

I don't think that the feeling was that strong with Huntsville, but I'm not sure. I just knew more about the tinkering from Houston on the orbiter than the tinkering from Huntsville on the engine.

So I really, I'd rather not comment on that relationship, cause I just don't know. And that tank being in there, that was never a problem to be best of my knowledge.

DR. ORVILLE BUTLER: What do you remember being the major problems in the design and development of the Shuttle?

MR. PHIL CULBERTSON: Major problem in the design and the development?

DR. ORVILLE BUTLER: What were the things that were always frustrating Headquarters?

MR. PHIL CULBERTSON: I don't know. I know we did have a lot of the concern over the development of the tile – insulating tile, cause that was so new to what was going on. Metal mechanical systems and propulsion systems – we had a lot of experience with them and other vehicles, but we never had to face the need to be able to bring these things back.

So there was a lot of sweat that went on in finally coming up with the individual tiles themselves. Then a lot of us worried about how they would be adhered to the surface, the metal surface. I forget how many thousands of tiles there are on one of these, but how you can put all these dots together and make it work. At least from my standpoint, I think I worried more about the insulation systems than anything else.

We had flown a lot of hardware in space. We knew how to navigate things and we did it. We knew what velocities we had to get to and all that kind of thing. We had that – we'd gotten that experience in other vehicles. We worried about the – all the things that the crew had to do, and knew that they would be getting out of the spacecraft and all that kind of stuff was new to us. The only people they had gotten out before was when they got out on the moon.

I can't give you any one (1) specific, or two (2) or three (3) specific things that stood out as a dominate worry, other than the insulation system.

DR. ORVILLE BUTLER: Okay. After Columbia arrives down here and they have the first launch. That launch was fairly successful. They got to do some mods out at the launch pad to take care of the sound shock wave and a few things like that.

The primary concern was during the first four (4) developmental flights appears to be, how do we get the turn around time back? What sort of issues do you recall being the focus of the turn around time issue? Or, if that something that is just Kennedy's problem and Headquarters said, it's your problem, just tell us what the time's going to be?

MR. PHIL CULBERTSON: Well, we knew there were going to be times when we were gonna have landings in California, and that introduced a new set of problems, but not a great deal because we could get it back here – carry it back here – in a week or so - something like that. I don't think we ever had to step in to worry about a specific problem on turn around. We kept putting pressure on `em to come a little closer to what we promised the Congress.

DR. ORVILLE BUTLER: Do you remember anything that Headquarters thought that Kennedy was weak on, in terms of its turn around program?

MR. PHIL CULBERTSON: I don't know that I would say Headquarters. I was concerned about how we could make sure that all of the tiles had

all the adhesives and then, that they weren't cracking in a way that we couldn't see them.

How do you test whether or not you still have a hundred percent (100%) of the adhesive working? I was always worried about the tile problem, because I came and I saw that there were chips and pieces. I'd come down and look at the way the tiles were being treated, and they were treating individual tiles very meticulously because it was a concern here too, and that was taking a long time.

DR. ORVILLE BUTLER: So, that special treatment that had to be applied to the tile, each tile handled it individually, each tile being unique to its position on the Shuttle, and in fact, each tile being unique to a particular Shuttle?

MR. PHIL CULBERTSON: Yeah.

DR. ORVILLE BUTLER: All created problems?

MR. PHIL CULBERTSON: Well, yeah, it just took a long time. We didn't try to pull every one to see if it was there. They didn't go that far, as far as I know. They may have done it some places, but most places they didn't. If there was a significant chip out of a tile, why that would be a concern and they would try taking extra care to make sure that it – when it was removed properly, it was put on right.

No, I don't think there was anything that stood out that I know, or that worried Washington, that didn't worry the Center here. I'm sure I'm missing some but you can't keep track of all these things.

DR. ORVILLE BUTLER: Sure.

MR. PHIL CULBERTSON: I mean you don't get involved in all those because the office on the Shuttle in Washington – there might be 20 people – and you know, we had specialists in all the different areas that had a special responsibility. I can't say that there is any special thing in the way of defining it. I'm disappointing you. (laughter).

DR. ORVILLE BUTLER: I want to hear all the different prospectives.

MR. PHIL CULBERTSON: You may get an entirely different feel from some of the people at the Center.

DR. ORVILLE BUTLER: Let's go on to the issue of prioritization of the handling of the Shuttle. What were the roots of the decision to increasingly turn over the handling and the operations of the Shuttle to the contractors rather than to keep it in NASA hands?

MR. PHIL CULBERTSON: Well, there were always a lot of contractors involved in it. The companies that manufactured the hardware would send a lot of people down here all the time. Kennedy civil servants, in most cases, were leading what was going on or supervising.

I can't remember whether there's any striking thing about that because all of that contractor work was done, the contractor personnel were here, of course, the Rockwell people would do that work on the orbiter itself. (inaudible) would work on its engine.

I don't know how to answer your question.

DR. ORVILLE BUTLER: Okay, then let's move on to the next one. The process of consolidating all of these contracts. We had a study, or several studies, in the late 70's that all suggest that they great variety of contracts – I believe there were 26 or 27 of them, that dealt with either processing the Shuttle or processing the payloads pr processing the ground support equipment. Those should be consolidated, and initially they suggested they be contracted into three (3) contracts. Where was the push for this consolidation, and what did NASA hope to achieve from it?

MR. PHIL CULBERTSON: That led to the big change that took place?

DR. ORVILLE BUTLER: Yes.

MR. PHIL CULBERTSON: Well, first it was – it's pretty common for – want to change that?

DR. ORVILLE BUTLER: We got a few more minutes.

MR. PHIL CULBERTSON: It's traditional in the government, both with the armed services and with NASA, that the first people from the contractors who need to get their hands on – out in the field, so as to speak, are the people who built it.

It's a logical thing because it's their product. They know the most about it and so they usually, the government, usually gives them a contract. The contractor gives them a contract to have its people on hand in the field to maintain it or to fix it or to make changes as they are necessary.

We just fell into that naturally. That most of the people working on the orbiter itself, the contractors, it was the responsibility of Rockwell to put them here on

the engine and so forth. But it is also very common, and in some cases, it's a requirement, that consideration be given to getting different contractors or at least to allow different contractors to bid on that part of the job.

It usually happens after the production contractor, or the people from that company, had worked on the maintenance or the preparation, the overhaul for a reasonable period of time, frequently years, to say, okay, now, you are the reason the government requires that it be competed. I believe that the NASA's case on the Shuttle.

That was a requirement. I'm not positive about it, but I know it is within the government that it wants that to happen. At least opened it up for bidding. The reason for that, is several. One (1) is that they want to get the best contract they can have with a company, and if another company thinks it can outbid the production company, they want to give it a chance.

In some cases I imagine the production would like to pull it's people out and get them doing something else at greater benefit to the company, but it is very common that, and it almost always happens that, after a certain number of years, it will be open for other people to bid those jobs.

Let me straighten it out in my head.

DR. ORVILLE BUTLER: Okay, while you're thinking about it, I'll ask. You had, I believe it was the 10 or 11 different contractors dealing with different aspects of the Shuttle processing, and you had the development of the Shuttle

Processing Contract where there would be one (1) contractor that NASA would deal with.

What led to that decision to rather than bid out to Morton Thiokol, separately for the SRB's, or Rockwell for the orbiter, or who was it?

MR. PHIL CULBERTSON: Martin Marietta for the tank.

DR. ORVILLE BUTLER: Martin Marietta for the external tank?

MR. PHIL CULBERTSON: I don't know. I don't know what that first one – opening it up for specialist. I don't know the answer to that. I'm not familiar when that happened. I'm not ever sure that it did happen, but I come back once again to say that the government – anytime the government, in most cases, anytime the government can see that there is another contract

(Side One of the tape ended)

MR. PHIL CULBERTSON: I am unfamiliar with how much of that took place. I always looked at, for instance at Thiokol, as gonna be the people that did the work at the engines. I don't think I had any other dealings with any other contractor on it at all.

Now, I didn't have a lot of direct – I didn't go out and talk to any contractor, any big contractor, by myself anyway. It was always within an office in which other people were represented. I can't comment on whether there was any tension of that or where the pressure came. I just don't know when that took place. I'm pretty familiar the process by which we consolidated the whole job.

DR. ORVILLE BUTLER: Let's talk about that process and the development of the Source Evaluation Board. Who were the members of the Source Evaluation Board and what was their goal in evaluating the proposals - who made contract bids and how did they evaluate the (inaudible)?

MR. PHIL CULBERTSON: The majority of the people on the Board were apparently senior people here at Kennedy Space Center. They all were had management positions. Very close to the top of the area in which they were working. We had some Air Force people come because the Air Force was still planning to fly the Shuttle out of the West Coast, and so they send us a couple of Colonels. We had people from Huntsville and Johnson and New Orleans.

DR. ORVILLE BUTLER: Do you remember any of their names?

MR. PHIL CULBERTSON: I chaired it. Well, sure, Andy Pickett, for instance here was essentially my Deputy on it. I got a list of them back home. I can call you on a few, but we had - there were about 40 people on the Board. I got the top half dozen and I'll give you a call, if that's all right, and I'm sure that they have all retired since then, but I know several of them are still around town. In fact, I talked to Andy Pickett yesterday, just about this.

They were chiefs in different departments, most of them. The people from Huntsville and Houston, they were also senior people. The one (1) from Houston was here because Houston didn't like the idea that we were doing this.

DR. ORVILLE BUTLER: Didn't like the idea that you were consolidating the contract?

MR. PHIL CULBERTSON: Yeah.

DR. ORVILLE BUTLER: And what was Houston's concern about that?

MR. PHIL CULBERTSON: Because it seemed to be taking some of the role away from Houston. See, Houston sent most of the – sent a lot of the people from Houston to work on the Shuttle here. There was a strong feeling in Houston that they knew more about the whole thing than anybody else. Some of them were pretty close to that.

They didn't like - see, Houston still had a reasonable amount of control over the contractors that they had who would move down here in the existing contracts. They felt more strongly about it than either New Orleans or Huntsville, but that was one (1) of the problems too because a lot of the people, let's say from Houston, they would come down here for awhile.

These were contractor people, who lived in Houston because they worked on the development of the vehicle. So Houston still took pretty strong control over what was going on here, by an element of control over the contractor. More so than in Huntsville.

Huntsville did some too, but the tank was quite different because it's inert pretty much. Didn't even know it caused one of the problems, one of the most severe problems, maybe because it wasn't given enough consideration, but it was a different kind of relationship that we had with the people in New Orleans.

There were, I guess, I think I may have been the only person from Headquarters that was on the Board, and Andy Pickett, the one that I mentioned, I had as my Deputy here. I picked him as the Deputy working for me. I sort of picked other senior people that I had gotten to know very well, and had a lot of respect for to lead individual parts of the evaluation as it went along.

I guess I mentioned – one (1) of the reasons we decided to do this was that there's some elements of the government that require that after a reasonable number of years, during which the contractor – the developer contractor – does the field work, the term field work, that is what goes on at KSC – it almost always happens, and it begins in the field by the development contractor, but the government wants that re-evaluated after a reasonable period of time.

I was not involved, I wasn't even thinking about it, because I was working on different programs. It was when I was in the midst of the starting up the Space Station program that I was called on to do that. I was still working on the Shuttle, but there is a concern in the government that if it has a product in the field, and its being handled and prepared for operation by its own people, that other technology that might be coming along, aren't exposed to that kind of a product.

The people from other companies might have an inside into improvement, early improvement, that would not otherwise become evident. So it's not uncommon that this kind of thing happens. It's kind of uncommon that as big a contract as this was, takes place.

DR. ORVILLE BUTLER:

And it was a pretty big contract?

MR. PHIL CULBERTSON: Oh yeah.

MR. PHIL CULBERTSON: And after STS3, they invited companies interested in making bids to send, I think it was ten (10) people apiece, out to Kennedy to watch the process, and there were about 10 companies, maybe 11 companies, that sent people out. How many of those ended up making bids?

MR. PHIL CULBERTSON: Well, there were only two (2) bids.

DR. ORVILLE BUTLER: There were only two (2) bids.

MR. PHIL CULBERTSON: I wasn't involved while that, by the time it had been decided, that there would be two (2) bids, by the time I was asked to get involved.

DR. ORVILLE BUTLER: So the Source Evaluation Board is only handling the two (2) bids. The one (1) from Lockheed and the one (1) from Rockwell and Associates.

MR. PHIL CULBERTSON: Rockwell and Associates, yes.

DR. ORVILLE BUTLER: What sort of things did you guys look at? What were your concerns as you looked at those two (2) bids? Newspaper reports say that the Board saw that there was a major difference between the two (2) bids and that the one that won, won hands down. What were your insights?

MR. PHIL CULBERTSON: Well, first we, we knew that, well, I should say we knew, but from past history, we were fairly certain that something like ninety percent (90%) of the people who are working on the job under those three (3) contractors would go to whatever contractor won and that did happen.

A vast majority of the people who had been doing the job, the working people, not the management people, but the working people, just resign from Rockwell and got a new job.

The financial structure that each one of them came to us. We looked at that very thoroughly, analyzed, were they really gonna be able to save money - was that a major factor. It turned out that that was – we concluded that that was not going to be a terrible significant factor, because there were going to be the same people working, which is ninety-five percent (95%) or ninety (90) or whatever that is, would pretty much go from one (1) company to another, without having to be relocated or any of that kind of thing.

I don't know what the percent was, but it was eighty (80), I think it was close to ninety percent (90%) that actually did. The biggest problem that we faced was that it would be, if it went to Lockheed, it would be a new senior management company, very much so. That if it went to the coalition that was working – it was going to be difficult to have these people working side by side from the two (2) different companies or from one (1) of the three (3) principal companies that Rockwell would have.

To see how they were gonna manage the relationship between one (1) man and his organization, working side by side with the other men, and they were both trying to work the same problem, but one (1) was working for one (1) company really, and the other one (1) was another company in the coalition.

DR. ORVILLE BUTLER: This fits in with their proposal, at least as it was covered in the newspaper. The newspaper dealt with what they called matrix management. Can you explain what matrix management means?

MR. PHIL CULBERTSON: No.

DR. ORVILLE BUTLER: Oh, okay. Was that there at that time?

MR. PHIL CULBERTSON: No. And let me go further and I'll skip to where we were very near the end of this whole process. I became sufficiently concerned about the how those three (3) major companies working side by side, all within the same company, in something - just triangles.

About how if I was with one (1) of three (3) companies and you were working for me, but from another company, I was worried about how you would like to get instructions from me. If I was with Thiokol, and you came to me from Rockwell and we were working sort of side by side, and you said I was doing it wrong, how would people work that way. I became sufficiently concerned that I called, and I'm gonna use a name, and I think it's the right name, Peter Drucker (phonetic). Do you know Peter Drucker (phonetic)?

DR. ORVILLE BUTLER: Peter Drucker (phonetic). I also understand that you took copies of the proposal to George Lowe, who was then a University President and a third person, Welch, at GE?

MR. PHIL CULBERTSON: Welch at GE. We didn't get a whole lot out of Welch or GE, but if my name is right, Peter Drucker (phonetic).

DR. ORVILLE BUTLER: There were three (3) of you that went out to visit Peter Drucker (phonetic).

MR. PHIL CULBERTSON: Yeah. Have you heard the story about how that went?

DR. ORVILLE BUTLER: Well, go ahead and tell it.

MR. PHIL CULBERTSON: Okay. Well, we got there in the afternoon, earlier I guess, and we spent about four (4) hours describing the two (2) proposals and gave him considerable detail about how the consortium, as they said it would do, explaining that. Then we talked some about costs. We gave the whole picture and did the same for both proposals.

It was late in the afternoon and he said, well, let's all go to dinner and we're not gonna talk about it anymore and you come back tomorrow morning. So, we had a pleasant evening, and met with him the next morning around 10:00 o'clock or something like that.

He said, well, I can tell that you, from the way you gave the pitch that your strongly leaning toward the consortium, to getting the job.

DR. ORVILLE BUTLER: Were you?

MR. PHIL CULBERTSON: But he said, it won't work. He said that when if you have a guy who is with Rockwell and his boss' from, let's say Thiokol, in this consortium, and you think it ought to be done one way and he thinks it ought to be done the other way, then you're gonna ask yourself whether or not to follow the instructions from the other man or follow the instructions that you think are right and

will do you better within the company you're in, the single company that you're in. And he said, that's gonna happen.

Do you follow what I'm trying to explain? And he said, that's gonna be a conflict for everybody in that situation. Do I, since I legally work for you, but you work for a different company than I work for really, my future career is with my company and I'd better follow what the company's gonna. He said, it won't work. He said I've only seen it tried once and that was in Canada, in the year 1965 or something like that. He said that's the only time I've seen it, and it didn't work.

DR. ORVILLE BUTLER: Did he identify the group?

MR. PHIL CULBERTSON: In Canada?

DR. ORVILLE BUTLER: Uh-hum.

MR. PHIL CULBERTSON: It was the armed services somewhere and he said the only time I've every seen it tried and it failed, and he said I'm sorry to disappoint you. Well we had, before we went out, we were ready to give it to the Lockheed proposal, because we felt that they would do a better job, but we also knew that, you know, there was always a twinge, cause they were very, very, close in the costs, so near enough to the same thing that that didn't make any difference.

Ninety-five percent (95%) of the people were gonna be the same people working, but we thought they had a better concept for how to manage it. So we were learning against the consortium, but he felt that we were favoring the consortium and said that's what wouldn't work. We should go to. That's the story.

DR. ORVILLE BUTLER: Now if you were leaning against the consortium when you went out to visit him, one of the things that the consortium proposed that was different that the Lockheed proposal, was there would not be significant reduction of the contractor people, but they said they could do it without NASA and NASA could save money by eliminating the NASA side of it.

Seems to me that would be pretty threatening to the Kennedy people. Do you think there's any?

MR. PHIL CULBERTSON: That was not a major, it was not a major thing because none of the, I won't say that, I was gonna say, none of the people who were involved in the Board were at the level to where it was gonna be a problem. I can't say that that's true.

I never sensed that. It might have been in the back of the minds of some of the people on the Board, but it never came to the surface. I don't know whether, at the time, I gave any serious consideration about that or not. I was unaware that that had been reported that was possibly one (1) of the factors.

DR. ORVILLE BUTLER: That's something that we grazed in looking at the two (2) proposals.

MR. PHIL CULBERTSON: Oh. Okay.

DR. ORVILLE BUTLER: That's obviously, if Kennedy was concerned about protecting their people and their on the Board, and one (1) proposals is saying well save money by eliminating two thousand Kennedy staff people.

MR. PHIL CULBERTSON: Civil servants? Cause they all were, at the time.

DR. ORVILLE BUTLER: Yes.

MR. PHIL CULBERTSON: I don't think we ever discussed that and I can't say that it wasn't in the mind of some of these people, and they just thought it was inappropriate to reveal it to the Board. For some reason it didn't occur to me in my thinking about it.

DR. ORVILLE BUTLER: What were the issues – how did you go about deciding that Lockheed had the superior contract. What was the process of making the decision - and let's start off with, what was the process of making the decision?

MR. PHIL CULBERTSON: Well, a major one was cost. We worked very hard at that. It did not, the difference was not to have – really was not enough to have swung it one way or the other, there were differences. Lockheed did propose – let me think about this - We felt that the single company would allow for a considerably lower – for fewer management people, because they wouldn't have this three (3) sided management that was going on in the consortium.

That the Lockheed organizational structure was simpler, and therefore should, we thought it would be more effective. We also felt, I think, it would not just be the workmen, but a lot of the senior people that would transfer too, so in many cases, it would be people a comparable amount of experience, in most cases.

There would be a heavier management structure - not heavier - there would be a lot more people in the management structure, in the consortium way of looking at it, which would be a cost factor.

Cost was as significant a factor as anything else, because I think that, we talked some about, NASA's gonna also have to manage the contractor. Looking at this meshed contractor structure that the consortium was putting together, made us feel it would be more difficult for us to get the right person, at the right time, in a hurry.

Because of the complexity of this management structure that this consortium put together, and that was a significant factor, we felt that the relationships which we could maintain with the single structure would be much, much better than this other complex structure.

I think that the complexity of this other structure was, in my mind, the most significant factor, cause I was convinced that, although as I recall, it turned out that there was not a great deal of difference in what we considered the cost structure would be. That was not a major thing.

I was concerned about management. I felt that the government had to maintain a significant strong arm in what was done, and it was gonna be a lot more straight forward, the government would know directly where to go - and the word when - if we went to senior management, and something had to get all the way to the bottom. That was a lot straighter than the other way would be.

DR. ORVILLE BUTLER: Very good. Once you made the announcement that Lockheed was going to get the contract, did you get any feed back from the incumbents?

MR. PHIL CULBERTSON: Uh-hum. I just got feedback. I had to brief the losing contractor about why we decided this way. Rocco Petrone who had been my boss for awhile when he was in NASA, told somebody, who told me that Rocco had told them this - Hell, Culbertson couldn't manage himself out of a paper bag, but the.

DR. ORVILLE BUTLER: But Rocco was at this time, with Rockwell?

MR. PHIL CULBERTSON: With Rockwell. But I can't remember, geez, I should, the corporate vice president of. I know him. I'd gotten to know him quite well. He came to me afterward. He was a vice president of one of the other companies.

DR. ORVILLE BUTLER: You can fill me in with that information when you sent that other.

MR. PHIL CULBERTSON: He said to me, you didn't have any choice, did you? I said, no, we didn't, and he said, we didn't give you a choice. Saying to me that he had respect for what we had done, and it was too bad for him, but it was inevitable it was gonna happen. So those are the only feedback I got. I went back to Washington.

DR. ORVILLE BUTLER: Very good. Now let's jump ahead to 1995 -96, when we consolidate contracts again. We had the formation of USA. Where you involved with that at all?

MR. PHIL CULBERTSON: No.

DR. ORVILLE BUTLER: Are you familiar with it?

MR. PHIL CULBERTSON: I'm not ever very familiar with what that structure is.

DR. ORVILLE BUTLER: Okay, well then, we won't ask you about that.

MR. PHIL CULBERTSON: Nope, I can't help you on that. I assume that they put together a good organizational structure when they did it. I don't know.

DR. ORVILLE BUTLER: Okay.

MR. PHIL CULBERTSON: But I don't know. I haven't had any contact with them at all.

DR. ORVILLE BUTLER: After Lockheed got the contract, did you ever have any sense that maybe you made a mistake?

MR. PHIL CULBERTSON: I didn't. No.

DR. ORVILLE BUTLER: Or were you involved in ongoing contractual issues?

MR. PHIL CULBERTSON: No.

DR. ORVILLE BUTLER: Okay.

MR. PHIL CULBERTSON: I went back to my Space Station.

DR. ORVILLE BUTLER: Let's move on the Space Station. Space Station was and is a pretty big issue out at Kennedy and one (1) of the early issues was the extent that Kennedy would be involved.?

MR. PHIL CULBERTSON: Uh-hum.

DR. ORVILLE BUTLER: Do you remember the discussion about what role Kennedy would play in Space Station?

MR. PHIL CULBERTSON: No, I don't. I don't know that I ever had any meeting with the Kennedy people.

DR. ORVILLE BUTLER: Okay. What were the issues that you primarily addressed in the development stage?

MR. PHIL CULBERTSON: The toughest thing was, what was the Station really gonna be used for. I felt, and pushed very hard to prove that I was right, which I was not successful at. I felt that the time had come for an honest scientific laboratory in space and I spent a lot of time talking to people who had ideas and we put out contracts for people to study what things might happen in space. And it hasn't materialized, and I still don't know why.

It was, you know, the basic design came out reasonably well. I was not as technically involved in the Space Station as I was, even on the Shuttle, because one (1) of my responsibilities was to get other countries involved, and I had toured the world to get other countries to be partners with us on it. Spent a lot of time on doing that.

Sure, I was also involved in the overall design concept, but the time that I spent was pretty much getting the system started, and convincing Congress that it was the appropriate thing to do.

DR. ORVILLE BUTLER: Was Congress reluctant to fund Space Station?

MR. PHIL CULBERTSON: Sure.

DR. ORVILLE BUTLER: And how did you convince them?

MR. PHIL CULBERTSON: Well, I'll tell you how we got the first of the money. (laughter)

DR. ORVILLE BUTLER: Okay.

MR. PHIL CULBERTSON: This a terrible story to tell and I just assume you wouldn't put this in your book.

DR. ORVILLE BUTLER: It's probably not related to Kennedy - it probably won't go in.

MR. PHIL CULBERTSON: Time came that, for the first time, we were gonna ask the government for a Billion Dollars, in the past years, and it was a year in which the process, for requesting that money that would be the Office of Management and Budget, would do its usual job of assessing what it thought was the appropriate thing to give to NASA for a program and present it to the President.

If we objected to the position that the ONB took for its presentation to the government, we could appeal it to the President. Well, they had strong objections to

the Billion Dollars that had, Hundred Million or something more, and so they told us and they said that your appeal date will be on March 31st or something like that.

They gave us a date and you'll have 12 minutes to pitch your story on why the Space Station, what, why you need a Billion Dollars, and then the Director of OMB will be allowed the same amount of time to give their pitch to the President.

I had a model of the Space Station about like this, and so I worked up about 12 simple little charts, what the Space Station was, what it could do, what we needed the money and they gave us the time when we'd be there. We each had 11 minutes. I would have 11 minutes and he would have 11 minutes.

So, I would have this model and I took it, and I went into the room where we would meet with Reagan and I don't know the office number was, or what the office name is, but it had a long table about 20 feet long and it was slightly oval and I was about as close to the President when I sat down, as I am to that gray chair.

I was sitting here facing the President when he came in and Guthrie (inaudible) was beside me.

DR. ORVILLE BUTLER: About 10 feet?

MR. PHIL CULBERTSON: Oh no, less than 10 feet. The gray chair, about eight (8) feet, even closer than that. Anyway, so I had the model sitting down here and I had the notebook and we all assembled and then the President came in and he brought his jelly beans and passed them around. (laughter)

And I was introduced by – I was with NASA, and so I took that out was close enough – the table was about a foot longer than this, but it was very close. I had

the notebook and I just showed him what I was talking about, and they were simple charts. I got just about to the end. I guess I got to the end and I timed it – God, I worked on that. I timed it to leave, at least a minute in my 11 minutes and I said, if you have any questions I'll be glad to –.

At the very end of my, I took this model out and his eyes got kind of big and he pulled it over to him and he didn't have anymore questions, and so Dr. (inaudible) started talking. Well, the President had this model and he was turning it around – and he did that for 10 minutes. (laughter) I don't think he heard a thing that the (inaudible) said. And we walked out the door together and he turned to me and said, you son-of-a-bitch. (laughter) Aw, I felt so good about that. Well, we got the money, and so that got us started.

I went out doing things like that, much more than paying a lot of detail attention to what was in – that statement was not publishable, but it's true.

DR. ORVILLE BUTLER: Okay, so the story about talking with the President is off the record?

MR. PHIL CULBERTSON: Well, the story about my model is off the record.

DR. ORVILLE BUTLER: Okay.

MR. PHIL CULBERTSON: You can say there was a briefing with the President the first time. I talked with senior people around the world. I briefed an awful lot of people as we were trying to interest other countries to get involved. There

are about a dozen different countries that are involved in the Space Station in one (1) way or another.

I was very pleased with that because I thought it was important and I still think it's an important thing. It's use, I vastly overestimated. I don't mind anybody saying that because it really, it hasn't shown for some reason, I still think that there are things that we're gonna learn in space and science that we will be very glad we had a Space Station.

It hasn't happened yet. I consider that it was, you know, a place that we could attach other things for repair and that hasn't been well done. I like the international aspect of it very much.

DR. ORVILLE BUTLER: Is that something new to Space Station?

MR. PHIL CULBERTSON: In that magnitude.

DR. ORVILLE BUTLER: Okay.

MR. PHIL CULBERTSON: That was a lot of fun too because we went to London and Paris, Berlin and Holland and then in that part, we went to Italy. In each country we'd talk with senior technical people in the government and they would say, well, what could we do, and what did we have in mind, and so we'd talk about it.

But we never did a commitment that if we didn't get on the first tour, we wouldn't get a commitment, but when we went to Italy we went in, and before we said a word, they said, what part of it can we have? They were really jumping for it. They got all different kinds of things.

I gave a speech to, what's the senior government, agency in Japan, what's the name of it? It's equivalent to our Senate in Japan and has a name that I should remember it, but I gave it and it was translated and so the Japanese would know what I was saying.

Then I got somebody, I guess the Japanese, I saw that they had also translated back into English, and I didn't even recognize it. These two (2) translations pretty well clobbered the whole thing.

Strange things happen in this kind of business.

DR. ORVILLE BUTLER: A potential they would have with constructing Space Station would be, the different countries that operate with different major (inaudible) systems and economics and things like that. Putting together different components which originally would be designed to meet only in space.

MR. PHIL CULBERTSON: Yeah, that's very true. Yeah, and I've tried very hard to get the rest of the group to say that we were going to develop this Shuttle and the Space Station in metric measurements, because all the other countries work in metric and I got voted down.

So that was unsuccessful, and I'm sorry because I think that had it happened. Well, they said for us to convert to metric, all of our machines would be a terribly expensive thing. I think it would be much better for the world if we were metric like everybody else. So I'm sorry we were so unsuccessful in that.

All the companies said it will cost you twenty-five percent (25%) more to build it metrically because we're not metric, but there are a lot of scientific things, we're getting increasingly metric. Got (inaudible) started with the Space Station.

DR. ORVILLE BUTLER: One question I want to go back to is the Shuttle processing contract very quickly. There were a small group of you that went out to visit with Peter Drucker (phonetic). Do you remember who the other members of that group were?

MR. PHIL CULBERTSON: Yeah, Andy Pickett was one and I'll have to tell you the other two (2). I'll give you a call on that.

DR. ORVILLE BUTLER: There's a story that's been told that one (1) of them wasn't sure that everybody would remember Drucker's (phonetic) advice one they got back here, and said that he took notes and had everybody sign the them. Do you remember that?

MR. PHIL CULBERTSON: I don't remember that that was done.

DR. ORVILLE BUTLER: Oh, okay.

MR. PHIL CULBERTSON: It may have been, but I don't recall seeing it. I don't recall that it was done or seeing it. I think we probably would have been willing to sign it and maybe we did. I just don't recall it. A lot of things that happened. That was a long time ago.

DR. ORVILLE BUTLER: Sure, sure. And some people embellish their own experience too.

MR. PHIL CULBERTSON: Sure. We. I think that I really had four (4) or three (3) sort of technical deputies. Two (2) of them went with me, it may have been just. I'll find out. Tell you who it was.

DR. ORVILLE BUTLER: Coming up on the end here.

(Tape ended)

DR. ORVILLE BUTLER: Okay, we're back.

MR. PHIL CULBERTSON: You said that you came down for most of the launches, and perhaps from a historical prospective, when they launched Challenger in January, during the cold season was one of the most significant, certainly one of the most tragic, can you tell us what you remember?

MR. PHIL CULBERTSON: Let's see. Once again I gotta ask you a question that I shouldn't have to ask you. Was Challenger, first or second lost?

DR. ORVILLE BUTLER: It was the first loss.

MR. PHIL CULBERTSON: First loss. What do I remember about it?

DR. ORVILLE BUTLER: Uh-hum. This would have been in January of '86.

MR. PHIL CULBERTSON: As I understand, and I was not at the meeting. Well, in the first place we had established a minimum temperature for launch and it was predicted the night before the launch the temperature was gonna be below

that. There was a feeling that, well, let me say this. I was not involved enough at that time that I was, well, that's not quite the way to say that because of what my position was.

I was not present at the meeting the night before when the temperature issue was discussed. I was not aware of the prediction of the temperature. The temperature at launch time, well, it was decided at – as I understand it – it was decided at that meeting, not to make an absolute decision about that regulation.

I understand that there was a feeling - for some reason - the President was very anxious that that flight take place. On that one, I am sure if that had been the case, I would have known about it, because I was the senior person here. The President was interested in that flight, but I got to know him well enough ultimately to know that he would not have said to violate a rule, nor would it have been any reason for that to have taken place.

He would not have been asked, or told, that would - might have to violate a rule. He wouldn't have been told that, if he had inquired. I was told later that there was a feeling that the President was very interested in the flight. At the time that I was in the control room, I was still unaware that the temperature was above, I mean, below, what we had said was the lower limit.

I left my console about three (3) minutes before launch and went up on the roof, because I wanted to see it from the roof. The only time I ever did that. So I was as shocked as anybody else. When it happened, I immediately went down to a small, a good size room, where I knew the senior people would convene and gave some

instructions on about, we've got to start things now, and I made some assignments for people to have different kinds of responsibility.

I spent, I can't imagine really what I did, after I got it started, but there was a two (2) or three (3) hour meeting that we tried to, people to look for parts and people to do this, and people to do that. Things they had me doing.

Then I got a call from Washington that the Vice-President was coming down and I was to meet him and tell him about it. Meet him at the plane, his plane. My first introduction to Bush, senior Bush. And interestingly enough, he said, where are the families of the astronauts, I want to see them first, because I – that showed a big heart, and that's what he did.

I stayed, not too long, after that, and after the beginning the investigation was pretty well set, I went back to Washington. That's about all that comes back to my immediate memory.

DR. ORVILLE BUTLER: What were some other major events in your tenure that we haven't covered?

MR. PHIL CULBERTSON: Oh, I don't know. I think I've kind of covered, and probably given more about, talking more about, the various things that I did get involved in.

Quite unrelated to this, we had, there was a group set up to meet with a comparable set of Russians to see if we could agree not to damage other peoples' satellites. And I think neither of us really planned or agreed to that, but both of us

thought it would be a good idea to talk about it, and I was the only person, I guess from NASA who was on it.

There was a group of about eight (8) of us. I guess we had three (3) sessions with the Russians. Each session went a period of about a month, where we met twice a week and debated this whole issues – upside-down, right-side-up. It was funny because we became, I won't say friends, but we became friendly, and in the morning sometimes I would go out – they would not stay exactly in the same place we were- but they would be nearby.

Three (3) or four (4) of us would meet and jog for half an hour in the morning. We had dinner with them once in a while, very rarely, but we became, I would say, we became about as friendly as you could come, with a good solid Russian in those days.

There's a big chart, about like this. It's a cut-away picture of the Shuttle, that Rockwell put together, and it was sold all over the United States and I'd taken one with me. We discussed, oh such things as, if you go underneath an optical satellite, or satellite that's got a big camera on it, and spray the lens with paint, is that damage? Or if you just kind of tip it over, does that damage it or do you have to physically damage it? It got kind of trivial, but anyway, we'd go on and on about this. The subject of the Shuttle came up.

DR. ORVILLE BUTLER: And you never came to an agreement as to what was damage?

MR. PHIL CULBERTSON: No. We didn't. And we ended up, there was no definite agreement that we would. A man from the Department of State was head of our group. He did most the talking. He would call out on the rest of us, to chime in when the time came.

At the last meeting I took a copy of the cut-away of the orbiter and when the meeting was over, knowing that you could buy these things in downtown Washington, D.C., I just unfolded it over and I pushed it over to the Director, the head Russian, and her eyes got big, you know, they never thought they'd see a cut-away of it. I'm kind of mean that way, I guess.

We departed friends. There was never any correspondence after that, but maybe the people from State did, I don't know. That was an interesting experience to spend a lot of three (3) months, spread out over a year.

DR. ORVILLE BUTLER: Do you remember what year this was?

MR. PHIL CULBERTSON: No, and it's somewhere in my memos, but I have to dig for it. I don't know when it was. It would have been mid 80's probably. Maybe a little after that.

DR. ORVILLE BUTLER: Was it before or after the Challenger accident?

MR. PHIL CULBERTSON: I think it was before.

DR. ORVILLE BUTLER: Okay.

MR. PHIL CULBERTSON: And you know that date better than I do.

DR. ORVILLE BUTLER: January, 1986.

MR. PHIL CULBERTSON: Okay, it would have been probably '83 or '84. That was interesting. I was put on loan. This doesn't have anything to do with space. I was put on loan to the White House for awhile. Got to know Colin Powell quite well. I was the NASA designee when there was an issue between NASA and the Department of Defense.

The first discussion of the issue was usually held with Colin Powell, two (2) or three (3) other people, and a Colonel who became - a Colonel in the Air Force, and we would just sit down, and explore it a little bit to see who ought to be brought into it - some kind of debate. When the Air Force was still considering launching out of California. Launching the Shuttle out of California, I was involved in those meetings.

DR. ORVILLE BUTLER: How did Challenger change policy at NASA?

MR. PHIL CULBERTSON: Well, we were much tighter after that about following our own regulations, since we had violated them (inaudible) Challenger. I think we all - safety - it was much more evident that people were concerned about safety, I think then we had before. We were always, I think, pretty good about safety, but we, you know, we had lost - we had the fire in the.

DR. ORVILLE BUTLER: Apollo 1.

MR. PHIL CULBERTSON: Apollo Program. We had the near tragedy when we lost the tank on an Apollo mission and came back home without

landing. I feel that safety was always on everybody's mind, but Challenger probably heightened that considerably. I felt that then.

I think, I'm not sure, that we. Well, I was unaware that there had been as many tiles that had to be replaced, as I would learn after Challenger. I think that gave a lot of us more concern, but we didn't quite know what to do about it. As far as I know, redesign, I'm sure that there was a lot more attention given to the process of bonding the tiles to the wings, the fuselage.

DR. ORVILLE BUTLER: Of course the tiles weren't the major problem on Challenger. The solid rocket O-rings.

MR. PHIL CULBERTSON: Yeah, the solid rocket O-rings were, but there was still at that time, we looked, I'm sure for, at what our history was on anything else that might be a problem.

It was always recognized that there was a limit to which you could lose tiles, and we hadn't reached that limit, but I think we became much more. We looked at the safety. Safety went up several notches in priority. I'm sure it went up a lot more after Columbia.

I don't know what else I can add to that, what happened. Anytime that happens, I think every organization looks at everything it does, tighter. I'm sure it happened after Challenger, and I'm sure it happened after Columbia.

I don't whether or not there are any organizational changes made after we lost it. Possibly there were.

DR. ORVILLE BUTLER: Very good. Well, that about covers the questions that I had to ask. Any last comments?

MR. PHIL CULBERTSON: Well, I'd like to ask you. What are you going to do with all of this? Are you writing a book?

DR. ORVILLE BUTLER: Yes, Professor Kenneth Lipartito and I have a contract with the Center to try the history of the Center, so I'm sure we've talked about the Center - the Shuttle processing contract. We will draw up on this interview to help support our coverage of that history.

MR. PHIL CULBERTSON: Okay.

DR. ORVILLE BUTLER: The transcript and the tapes themselves will be turned over to the Center Archives, where they'll be accessible. One of the things after the interview here, I'll be giving you a release form.

MR. PHIL CULBERTSON: Okay. I'm writing a little history, but I haven't gotten yet to the Challenger, so I've still got a lot of material that I've got to read to refresh my own memory before I quit.

If I think of anything, where I can correct something that I've said this afternoon, or I think of something else that I might add, I'll give you a call.

DR. ORVILLE BUTLER: Sure. And one of the things that we can do is, after we get it transcribed, we can send you a copy of the transcript and.

MR. PHIL CULBERTSON: Maybe that will stimulate me to either add something, or tell you to take it out.

DR. ORVILLE BUTLER: Correct.

MR. PHIL CULBERTSON: I'll be glad to do that.

DR. ORVILLE BUTLER: Stuff like that. Okay, well thank you very much. Appreciate the time you took to stop by and talk with us.

Thereupon the interview ended.