

**August 4, 2003**

DR. ORVILLE BUTLER: I'm Dr. Orville Butler and we're in the 4<sup>th</sup> Floor of the Launch Control Center, here at Kennedy Space Center this morning, August 4, 2003, talking with Thomas Overton. And I guess I'd like you to start by giving a little bit of background of yourself, where you grew up, how you arrived at Kennedy and then a little bit about your career here, and then from there we'll move on to some of the issues that we want to talk about.

MR. THOMAS OVERTON: I was born in Iowa and not really a (inaudible), but anybody who lives in Iowa is like a (inaudible). I was interested in Rocket (inaudible), in the 50's about setting some kind of a record of 250 miles altitude with a V-1 modified with some little other rocket on it. It was fascinating to me, but pure science fiction.

Then in the 50's, middle 50's, there was a Disney television show that featured Tomorrow Land and Wernher von Braun, and his promotion of an idea of going to the moon and that was just so fascinating to me, I like that better than the cartoons or any of the other things that just. But as (inaudible), it was beyond my – you know, I couldn't even dream about doing something like that. I was not particularly good in math when I was real young and I knew – so I thought to myself that an engineer was a very brilliant superstar, and there was no way I could be anything like that. I didn't know what else I was gonna be.

Worked at a grocery store for awhile. Anyway, with that kind of a background and having Wernher von Braun as kind of a hero. He seemed to be a moral person and, of course, with his idea of going into space and going to the moon, was fantastic to me.

I did start in college in Iowa State University, went for a year, and had trouble with math. A lot of it was not applying myself, I think. Got married as a teenager, had to get permission to do that. Went to California to seek a fortune. Didn't find a fortune, but did get on as a engineering draftsman, with (inaudible) at the time and they happened to be working on the Saturn Third Stage of the Saturn V rocket.

I was a pretty good draw'r and I was a pretty good draftsman, I guess, and so they, after four (4) years, they asked me if I was interested in coming to Florida to work in the Saturn Program. They needed people here. They were gonna provide me swamp pay, which would have put my salary up from like \$3.00 an hour to over \$4.00 a hour, including swamp pay for living in Florida.

At the time, Californians distained Florida. I was, I don't know, it was just the way they were out there. And I was a little bit that way myself. I thought, well I deserve extra money for going to the sticks, so to speak, the swamps. Nevertheless, my wife and I moved, it was an 18 months situation. I was gonna work down here 18 months, do a lot of drawings and get the S4B stage, the Third Stage of the Saturn V rocket snuffed up so they could launch it to the moon.

DR. ORVILLE BUTLER:

And what year was this?

MR. THOMAS OVERTON: This was 1966. We actually moved and it was April 15<sup>th</sup>. I think it was tax day. So, I started working on the Saturn rocket and it was exciting for me. I had heard about all about the big buildings, the VAB, and to see it. Worked at Pad 34 - 37.

I remember one of the significant things, and yet, I was a draftsman, but I had been promoted. Let's see, I wasn't quite an associate engineer yet, I was still a draftsman at the time, but I met Wernher von Braun for the very first time at Pad 34. He had come into the blockhouse and the press scope's there. They used to look through it, at the pad. He came in and went to the press scope and looked through it and I was in awe. I was like, here's my hero, you know. And here I am, I'm somebody – I'm working in the Space Program.

A few years later, a couple years later, I guess, I met him in the cafeteria in LCC. There used to be a large cafeteria on the first floor and the section of the building closest to the launch pad. I was in line right behind Wernher von Braun and I hardly introduced myself, not wanting to bother him. I was very conscience of him and other people pestering him and all that, but he was very gracious and didn't mind talking at all. And so I went to chat with him, and even sat down with him and had breakfast, but so, that was a thrill for me.

So, that's kind of how I got started here at Kennedy Space Center. They were still launching Gemini's at the time, so I think I saw the last couple of flights, manned flights. In January of '67, it's my wife and I's anniversary, January 27<sup>th</sup> is the day we were married, and we were to go out to dinner that night to celebrate our

anniversary, but we had a test at the pad, Pad 34, a demonstration test, with live fueling and oxygen in the capsule and I was in the Stage right below.

Actually, previously, not during that test, seems like a lot of responsibility I had for a draftsman, maybe. I guess I was called an engineer about that time, but I was like an associate engineer type thing. It's a non-degree engineering title. But anyway, I was involved in the test and the accident occurred, and that really shook me up. My neighbor was the test conductor, Hank Syzkecky (phonetic) was the test conductor for Rockwell at the time, and he was upset. He was the head of the test conductors, I think. He was pretty high up the ladder with Rockwell. I got with him and we talked about it and stuff.

It was a terrible event and quite a shock, cause here you are, thrilled to be part of the space program and all of a sudden, three (3) people die. It was a real blow. It was like, it just kind of shut everything down, and unfortunately that was the first of three (3) major events that occurred in my career here.

The company I worked for here. I worked an additional nine (9) years. I worked four (4) years in California, and nine (9) more years for Douglas here in Florida. They bugged me about going to school and so I started off with college algebra, going to school at night and I did pretty good. I got up all the way through advanced calculus and the difference in equations and got straight A's, so I don't know what happened to me. Inspiration or whatever, but I finally ended up going to UCF, graduating from UCF with a master of science and electrical engineering with honors and everything else.

So, just because a person is unsuccessful as a young man, doesn't mean he should give up. Anyway, and I went to work for NASA. I decided, I went through a period right after the Apollo, I don't know what you'd like to hear, but I've kind of given you a biography

DR. ORVILLE BUTLER: That's fine for the start off. We'll go back and ask you some questions.

MR. THOMAS OVERTON: Okay. During the Apollo, of course it was extremely exciting to me. I'll tell you the rest of my, I worked on the S4B stage, and I worked a lot with the contractor below us, the S2, North American folks, and IBM, the (inaudible), that was on top of us. Working with those guys, and seeing the balance we had with the interfaces between the flight components, or how come things didn't light up how they were supposed to, and the complexity of having all different contractors – you had Grumman, IBM, Rockwell, Boeing, Douglas, and a lot that I left out. Those were probably the major contractors.

I honestly had a feeling in my heart that it wouldn't work. I couldn't conceive that, how we could get everybody working off the same page, and have everything just work and so I thought, gee, I wonder if this is some kind of a big boondoggle (phonetic) or some kind of a ...

It looks like they're trying to launch, but how in the heck are they going to get everything to work, with having so much trouble and things are just not working right. (inaudible) who is in control of this. Who is just the genius that sitting somewhere trying to put all this together, and make it work. Well, the first Saturn V

launch, well we went through the 1B's, I kind of skipped over them, but I remember, the first Saturn V launch.

DR. ORVILLE BUTLER: That would be Apollo 4.

MR. THOMAS OVERTON: Yeah, 4 was the (inaudible). It worked.

It went up, it launched. It was successful. I mean, I was amazed. Anyway, and of course, now it heralded as one of the most successful programs. Personally, I think we were very lucky. I don't know if there's anymore skills left then as nowadays or anything, it's just we were fortunate. We didn't have that many missions.

After the Apollo program was winding down there, before Shuttle, there was a big lay off in the area and I actually got a lay off notice. I'm gonna digress just a little bit. This was actually before I got my engineering degree, because they kept the degreed engineers first, so I got my lay off notice, and at the same time, I brought this cigar, they used to do that in those days when you had a baby.

He said I hate to - this is a bad timing - I hate to tell you this, but, and he gave me a pink slip of lay off notice. As it turns out, my skills were needed in the Delta program, so I worked two (2) years in the Delta program, while we were kind of waiting for the Shuttle.

DR. ORVILLE BUTLER: The Delta Program is unmanned launch?

MR. THOMAS OVERTON: Unmanned launch, yeah. I actually, specifically designed some of the instrumentation panels, and it was more not designing their function as it was, how are you gonna put different meters, and things and arrange it within the panels in designing, you know, the switches, so it would be a

handle for the engineers to look and see. You know, the track, strip charts and things like that. A draftsman's type job, I guess. Anyway, I worked there a couple years.

Course knowing that I had been given the lay off notice, I worked very hard at getting my degree - 22 hours of technical courses in one (1) semester, so I know, there wasn't any television in my background at that time. So, anyway, I co-op'd with NASA. I resigned, actually I gone through a (inaudible). I was laid off, technically because I got more benefits that way. I got laid off on a Friday and went to work for NASA on Monday.

So, I really was never out of work. I was very fortunate. I understand that. I went to work for the Federal Government as a co-op, probably one of the shortest in duration co-op in NASA. I only worked two (2) work sessions. Went to school once, I think and I graduated. Then I went to work for NASA full time.

DR. ORVILLE BUTLER:                    There work sessions would be?

MR. THOMAS OVERTON:                    A semester, yeah. Work a semester and then go back to school for a semester, and then come back and work again and then I went to work at night the last work session. I graduated and went to work for NASA full time with NASA. I worked in the faculty training building over on Headquarters area and my specific job was to build the first launch processing system and the hardware interface module, which is a console, it's the digital to analog conversion. The computer sends digital signals, but the computers can't open valves or close valves, so you have an analog system set up that activates relays, things like that. That the hens (phonetic). Hens are located all over the Center out here.

Part of the (inaudible) of my job, even as a co-op, was to build the first hen. I went to (inaudible) road and I actually got a rack, and put in power supplies and a lot of trial and error, but I had a lot of help. An awful lot of help, but anyway, we build the first hen. (inaudible) in that time frame.

DR. ORVILLE BUTLER:                   And this would have been in the early 70's?

MR. THOMAS OVERTON:                This would have been in '74, '73. Yeah about '73, which was when I started co-oping and graduated in '75. Excuse me '76. Went to work for NASA full time in '76, and I decided to go into operations. Let's see, I was in SRB Processing. Conrad was the VAB site manager at the time. Let's see Tip Colon was the pad site manager and Jim, I can't think of his name.

DR. ORVILLE BUTLER:                Harrington?

MR. THOMAS OVERTON:                Yeah. Harrington was the OPF facility manager. Phil (inaudible) was the NRP manager. I guess Conrad was the VAB manager. Working for him I had, we had, we were involved a lot in the conversion of the VAB from a Saturn V assembly facility to a Shuttle. We primarily did things like take the main extendible platforms that provide access to the Saturn V, which were on the top were a series of concentric circles that come into platforms. Had to reshape those. Take them down and reshape 'em, so the wings of the orbiter would fit through.

So, I did that and did a lot of facility upgrades, track and that sort of thing, and made sure they were done, and so that we would be ready to support the Shuttle when it came around.

Part of that was the flying test, testing the reaction of the SRB's on (inaudible) of the MLP, so we'd know what the resident frequency was of the SRB's, not just from calculations, but from a real test. We would bolt it down and it had the same equivalent, was not (inaudible), but it had the same elasticity of the live segment and so we stacked the segments and put a big (inaudible) around 'em and used a device to shake it back and forth, rock it back and forth, to do our test.

DR. ORVILLE BUTLER: Why would you need to know the resident frequency?

MR. THOMAS OVERTON: Well, when you lift off from the pad, you have to ignite the main engines of the orbiter first before you ignite the SRB's, because they are so much more complicated. There's triple pumps to spin up, there's (inaudible) and measurements that are being taken, temperatures, pressures, all that. We have to make sure the SSME's, the main engines, the orbiter main engines are working properly before we ignite the SRB's, because once you ignite the SRB's there's no shutting down. You're going off the pad, no matter what, so we needed to know.

What happened was since the orbiters kind of wavered off the (inaudible) the vertical Shuttle, it weighed about twenty-five thousand pounds, depending what the payload is, maybe two hundred and fifty thousand pounds and, that's kind of hanging off the external tank.

When you fire those engines first, your still connected to the SRB's to the MLP and it forces the top of the external tank, (inaudible) then the whole tank because of the force of the main engines. And we weren't sure, we had calculations but we

weren't sure, till we got some really good data, how long it would take for the reaction time for that thing to come back again until it was vertical.

We didn't want to ignite the SRB's until the whole stack was vertical again. So, that's why we did these tests. We kept bending the SRB back and forth, and calculating the time, and that has a lot to do with the number of seconds between SME, main engine orbiter ignition and what (inaudible) zero is. Turns out, it's around six (6) seconds.

So, what you have on lift-off, you have the main engines igniting, bending everything over, I guess about three and a half (3 ½) feet at the top. Moves that much. And then it reacts against the hold down post and kept swinging back to vertical and vertical at T-0 and we make this.... **(interview interrupted by telephone).**

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

MR. THOMAS OVERTON:                So that was one of the things that went on in the VAB and preparation for Shuttle. I then went into, once we got the VAB upgraded and the pads and the OPF's and that sort of thing, we decided – well, I was VAB, I was Conrad's right hand man concerning the VAB and getting it ready.

We decided to bring in a test article to simulate the orbiter and take it vertical and take it through the platforms, and it wasn't a real fit yet because it didn't have very high fidelity. It was just some beams with some sails on it to make it look kind of like an orbiter with wings.

We learned one thing, that the crane cables twisted, and we knew we couldn't have any tethers on the real orbiter, and we were trying to figure out what we

would do there so we ended up having to rewrap all the cranes and everything, so that the payloads wouldn't swivel.

We also worked on the brake-over bar for the sling that attaches to the orbiter that brings it to the vertical position. Went out to California and did some testing on that to make it so we'd know how to pull a (inaudible), without there being weight on the aft end. Complex, but that's one of the extra things we had to do while we're getting ready for Shuttle.

The platforms was part of my biggest thing, cause getting all the platforms ready there's a hundred and - I'll have to check the numbers, but seemed like a hundred and fifty different individual little (inaudible) to go around the different wings and all the different protrusions from the Shuttle, and of course the Saturn V was, so we were constantly modifying those, checking them out and everything.

Then we had the SRB work for a couple years. We stacked the first segments and played a more hand-on role. In those days we were like the lead operations and all the contractors would report over to (inaudible) on their radios, to the NASA Launch Director. That's been pretty much delegated to the contractor at this point.

Then I got into - do you want to start scheduling? I said, you got to be kidding me. Why would I, when I can get my hands on the real flight hardware, and all that neat stuff, would I want to go sit in an office and schedule? It sounded like a real bad job. Turns out I have a real knack for that. That's what I been doing for the last twenty years or so, is scheduling Shuttle launches.

Basically, over the years, we started off with the tape, bag boards and taking photographs of the bag boards, and once we put them up on schedules, then we went to something called GPS, which was a ground processing system, I guess made by IBM.

We had about 24 people working on that computer system that tried to tell us when the launch dates would be based on all the work that had to be done.

Then we evolved to something called Artemis (phonetic) which was another computer program that was about a Three Million dollar mainframe type computer program, that didn't do anything but schedule.

Now we've evolved to something called AMP, which is automated manifest planner, which we just load on to our PC and it does so much more than any of the other systems that we had. We use now, daily, to schedule the Shuttle launches, basically and the major milestones. ETS (inaudible), corporate roll out, roll out to the pad, launch, all that stuff.

DR. ORVILLE BUTLER:                      So, this is kind of an upgrade from the old (inaudible) charts or (inaudible) charts?

MR. THOMAS OVERTON:                      Um-hum. Yeah. There's a chart here. I know this isn't gonna come out on your recorder, but it's what we call a Digress chart. This is what the actual program uses. At Headquarters, they use this particular chart right here, that you see right here to show the launch dates and their (inaudible). We can't go to station and dark days now, because we're not going to be able to launch in

the dark. These are all the Russian launches. The Soyuz's in progress and all that. We have to check on all that stuff. Meteor showers and, we got a lot in the program.

DR. ORVILLE BUTLER:                   And the meteor showers would be so?

MR. THOMAS OVERTON:                We don't want to go into orbit or out of orbit through the meteor showers in November and the (inaudible) showers, just because of the increased odds of having a strike, so if you can avoid it, we just avoid it.

There had been years when they could somehow predict the intensity of the showers and some years they actually waived it. I don't think we ever launched through it, but we could have if we needed to. But yeah, that's just one of the many things and constraints that have to do with the configuration of the Space Station with regards to pointing towards the sun to get enough power - the unlimited solar panels and the position that it puts the orbiter in when it's attached to it. It's too much heat. We're not allowed to launch during those times, so it relatively complex.

Then the other things we look at are the mods that have to be done on each orbiter, when you have an annual maintenance and that sort of thing. It's actually every three (3) year type of maintenance thing for every eight (8) flights. What mods need to be done during that period. When it will be back on schedule, so we can pull it back in.

Let's see. One thing I suppose everybody talks about Challenger and Columbia, but I don't know if you want my part of that.

DR. ORVILLE BUTLER:                Sure. Why don't I start off by asking you a few questions about your early career, and you may or may not be able to

answer them. And then we'll move up into Challenger and Columbia, and intimately you were working Columbia recovery?

MR. THOMAS OVERTON: Correct.

DR. ORVILLE BUTLER: Back when you first came to work here, you mentioned all the different contractors. Most contractors, most corporations have what's called a corporate culture and sometimes those corporate cultures are very different from each other. Do you recall anything about the differences in the corporate cultures of the various contractors that you interfaced with?

MR. THOMAS OVERTON: Well, there's only one (1) that comes to mind. I kind of felt like – Chrysler, for example, everybody talked about working for Chrysler. We knew when they get laid off, they get paid for a year. I don't know how that applies to your question exactly, other than we had an (inaudible) which was under a different union. They had maybe a stronger (inaudible) bills workers union or whatever, and we always thought that must be pretty neat to be laid off, and be able to get paid your salary for a year.

Then we had a culture of IBM, which you could tell the IBM'r cause they always wore white shirts and ties. Actually IBM held pretty high respect around here, because they had a reputation of not laying off people. And then you had other companies, Douglas, Rockwell, and I'll be honest from a working level they felt like a lot of times there was attitude of, we're just people and when their done with us, they use us when their done with us, they'll (inaudible) and lay us off.

That was particularly the strong feeling in the mid 70's, when there was such a big impact here for the (inaudible) capabilities of the workers, as far as their attitude towards doing the job, and then there really wasn't any difference there, I think. Everybody was striving – it was neat to have a goal. That's one nice thing, it's just not making a profit for the company, or you're trying to manufacture something quicker or anything. When you have a goal that's, you really like, going to the moon or building a Space Station, or whatever.

It just seems like people are trying to do more than asked sometimes, and I don't think there's that much difference between the companies as far the performance of the individuals was concerned. Just some were looked at as being - hey, that'd be better to work for that company.

IBM, I know a little bit about because my wife was working for them for two (2) years. She only worked two (2) years in forty-one years of marriage, and she worked for IBM, and she was a secretary to George Smith and we got, all my kids birthdays, they sent presents – corporate did. We went to company picnics and they furnished presents, and I know you weren't allowed to have any alcohol at any of the things. They just had just kind of a neat thing, whether you drank or not.

It was the idea of the way they treated their people and everything was just amazing. I can sense from a corporate standpoint that the loyalty of their employees was probably considerably above the loyalty that some of the other employees had for their companies. So, I think that's all I can tell you on that subject.

DR. ORVILLE BUTLER:                      Sure.

Another issue in terms of culture that you may or may not have been involved with, several people have mentioned the fact that they seem to have been two (2) cultures out at the launch pad. There were the launch vehicle people and there were the spacecraft people. So you remember anything about that?

MR. THOMAS OVERTON: Well, I probably can't help you there. I was a lot different than a launch vehicle person. You're talking about (inaudible), I guess. There probably was, but I can't. I rather not guess at that. I don't have a strong feeling about that, so - it may very well have been a cultural difference there.

DR. ORVILLE BUTLER: Okay, and you'd only been here about ten (10) months before the Apollo 1 fire, so you hadn't necessarily had a great experience with management and operations techniques prior to Apollo 1, but do you remember what sort of things changed after the fire - or if things would have changed after the fire in terms of policies or procedures?

MR. THOMAS OVERTON: Well, there were a lot of things that changed after every one of the major accidents.

DR. ORVILLE BUTLER: I'm going to be asking you about the other two (2).

MR. THOMAS OVERTON: After the Apollo 1 fire, most of the things that changed there, didn't affect me at my level. There were design changes made to the capsule itself and safety was obviously, I think everybody knows they redesigned the escape mechanism and all that, and did the testing with the nitrogen, which atmosphere, instead of pure oxygen. And, you know the redesign of the capsule

itself had less probably materials inside and all that, but as far as. You're right, I probably don't have enough to compare it to prior to that to say, well, we did things completely different.

We did some crazy things. Things that would amaze ya. Like Pad 34 - there used to be a man lift, you know, and it was a lift about 100 feet high and instead of taking the elevator, you could take this man lift. It was just a (inaudible) and it had like a six (6) inch plate every ten feet or so, and a handle that you could grab and you just kind of jump on it, and it would just pull you up. And you could go up over the ocean and just. It's a wonder we didn't have more accidents.

I remember one Douglas guy, he forgot to get off at the last stop up over the top, and he was injured, not critically, but injured pretty good. I mean, he was beat up pretty bad, and had cuts and all that, but I don't know if that's changed any. I don't think, I think they still used it for quite awhile.

It's like the base standards. I know we had a fatality out there when a guy stuck his head through the elevator shaft, that used to be open, now there was grading but there were openings, and he looked to see if it was coming up and it was coming down. He was killed out there at the pad. That was kind of, I'm getting off tract here. Just get me steered back on if you need to.

One of the fun things that occurred, and its not necessarily related to the tragedy, but there were testing with the dummies. There used to be an escape.

DR. ORVILLE BUTLER:                   Slide iron.

MR. THOMAS OVERTON: We used to announce that they were gonna test one of the dummies and they would always say, and the dummy will be released on my mark, Three, Two. Well, as soon as he announced, all the people in the shift, I forget the name of the building, right close there to the pad, said - he says, the dummy will be released on my mark - everybody would run outside to see what happened to the dummy.

Cause they released the dummy and sometimes it would come down so fast it would hit the end and it would just break all apart. There would be a head down one way and an arm another way. Next time they'd put more slack in it so it wouldn't go so fast and it would get hung up. It wouldn't make all the way to the end, and it was just really, it was an entertaining thing to see that dummy getting released down there. I know they got all that squared away.

We had some things happen with hydraulics systems – we had a hydraulic line bust under pressure and the S4B stage, wiped out all the cables in the aft one time. We worked a tremendous amount of overtime, seven (7) days a week, twelve hours a day.

DR. ORVILLE BUTLER: Do you remember which mission that was?

MR. THOMAS OVERTON: It was a 1B launch probably, I don't remember, 37 or 34 and I don't remember, but it was during a test and that hydraulics system spewed out, it was like a knife and it just severed hundreds of wires and cables.

It just sprayed hydraulic fluid all over and we had to go in there and retest and replace all those.

It was, and that resulted in some changes to the hydraulic system and you probably remember, or you may not, there was an explosion of an S4B stage in a test firing in Sacramento, California when they test fired the S4B's. One of the spherical tanks that they used to pressurize the engine and actuate valves and that sort of thing.

I believe that's what it was, exploded while it was loaded with (inaudible) and it blew S4B stage all over the area up there and they sent a crew. I wasn't part of that. I was used to go out to Sacramento to pick up the vehicle to bring it back, but that caused a redesign of all these spherical bottles, cause it turned out to be a (inaudible). So that was a redesign.

A lot of events that helped along the way to make it. Course, I guess it was that same thing that failed on Apollo 13. The (inaudible) thing. So, I don't know.

DR. ORVILLE BUTLER:                   What sort of a, you know anything about the quality control organization, or quality assurance or safety organization and how that changed, or was that well beyond your (inaudible) at that time?

MR. THOMAS OVERTON:               From my small prospective, all these events cause us to be more and more careful. It seems like restrictions got tougher and tougher as time went on, and that's probably only natural, but I used to not be up to, if you disconnected an electrical connector on the vehicle, you'd maybe take out a component and reconnect it, - make sure you put it back on.

But after a point, they decided, well, they found, they seemed to think when I disconnected something, maybe the pins didn't line up exactly right or something, so. I know they instigated a mate – demate system, where they would, when you had to - when you demated a connector, you had to inspect it, plug it in and then you had to demate it again, look at it again, both sides and plug it in again. You couldn't just do it once and whereas a tech used to be able to do that, then there had to be an inspector, so, I mean, that's just a small thing.

I don't know if it's a result of a specific event, but it was something that even today, we, I mean they still do certain things. Actually, they still do some things that I thought we overcame. I see certain things get repeated even. And I'm not saying it's not dangerous or anything like that, it's just if, like people forget or something. And maybe the same old timers are not here anymore, and they have to learn it all over again or something.

Once in awhile you'll have damaged wires, and I know it was Dan (inaudible) who came up with an invention of a machine that would put the receptacle and the pin number as part of the wire number. It was very difficult, if you had broken wires in the middle, finding exactly what wires they were - Which ones to replace. You about had to pull the whole harness apart and route them to ground to figure. Well, it's easy to check if you run continuity on it, you know, start the connectors, you'd just have to keep checking and checking till you found out which ones they were, unless you wanted to take off all the wire wraps and take off the whole ball of wire or something.

Some guy figured out if you put the pin number on the plug and jack number, that's part of the wire number. They could go right to that pin on each end and find out if there's continuity in it. If there wasn't, you know, then they had a good idea that that's the one that is busted, or just replace that one maybe. I guess we do that today in Shuttle, that's one thing they did carry over.

DR. ORVILLE BUTLER: In spacecraft they check, after the Apollo fire, they checked the next spacecraft, that wasn't going up on Apollo 4, well it did go up on Apollo 4, and they found over 2,000 wiring errors on it.

MR. THOMAS OVERTON: Wow.

DR. ORVILLE BUTLER: And they had to have quite an investigation and do a reworking of that.

MR. THOMAS OVERTON: I know that was a lot of. We did a lot of that when I was talking earlier about working seven (7) days a week, and twelve hours a day, when all it was during wiring checks. Cause I ended up being (inaudible) too.

DR. ORVILLE BUTLER: Okay, Apollo winds down. You talked a little bit about the space recession in the early 70's, and then Shuttle arrives. What do you remember of the arrival of STS1, the Columbia?

MR. THOMAS OVERTON: I keep thinking that my first thought was there was another vehicle that came here first.

DR. ORVILLE BUTLER: Enterprise.

MR. THOMAS OVERTON: Enterprise yeah, and it was a more exact model. We did a lot of tests with that as far as getting all our procedures, you

know. The first orbiter, it came. I wish I could remember exactly my feelings. By then we were just so anxious for it. I know one thing about all the orbiters - I'm used to it now, I've seen so many - but my first impression when I looked at it, was that it should have been more sleek and clean and perfect then, or it appeared to be. If it was an airplane, I probably wouldn't have gone on it, cause airplanes are polished and clean and shiny.

DR. ORVILLE BUTLER: Still had a lot of.

MR. THOMAS OVERTON: Still had a lot of holes and tiles and stuff - not quite completely put together. And I just thought. I expected the model to be, you know, it's not the real orbiter. I can't remember too much more that stands out about that particular...

DR. ORVILLE BUTLER: What were you doing during that time period?

MR. THOMAS OVERTON: I was VAB integration manager, I guess. I was like, handling from the NASA standpoint, the orbiter (inaudible). (inaudible) And I had all the operations at the VAB and worked on a lot of procedures. Actually there's, all of us out here, if we ever get our name in the paper, we'll make this crap (inaudible) working. They took pictures and stuff cause I was leading the operations guys by putting it together, and all that. It was pretty interesting work, first two (2) or three (3) flights. Then I switched over and had worked mostly on SRB's.

A couple years after that I went into manifesting, which is what I do now. It's really neat. We developed, there was a little bit of twist in the cable when we

brought it up, and it was a model sling to see the orbiter go vertical, and our redesign of that that sling made it easier to disconnect the spreader beam and get rid of it.

The one that's connected to the (inaudible) frame. Lift it up, bring it through the platform, so we developed push-heads. You can't touch the tile and there's no hooks or anything that you can put a rope on, so it's just hanging, the orbiter is, and so as it goes down through these platforms, I think the clearance had to be eight (8) inches, that's the closest we could get. When you're talking about something that's a long and as wide as the orbiter, and (inaudible) is eight (8) inches to platform and you don't have any way to tether it, it gets a little dicey.

So, we developed this long aluminum pole for the (inaudible) tied on the end of it and we trained everybody to just gently, one on each side of the wing, for example, cause once you start it moving a (inaudible) that big, you know, it's got to stop. So, you got one on each side as it's going down and it gets a little to close, to gently push it, and the other guy on the other side, has a little reaction to it.

You start it down through those platforms, and that evolved. Various changes for with, you know, with (inaudible) and the high fidelity models, but then even with Columbia, those are things that were changed each time. Every time we launched we'd make some kind of improvements, like the way the platforms operated.

I had a situation, again it sounds like I'm giving my biography, but I just thought of something in regards to the platforms. The (inaudible) platforms that are (inaudible) in the air, there's a safety chain that was just cutting into the floor and we removed those chains. There used to be a skinny little platform that you go from one

side to the other, but if the chains were up there, you could shimmy through there and get to the other side and when the platforms were extended, sometimes the chains would be gone and we wouldn't think about it, we'd walk right across there, breeze and....

### **TAPE ENDED – SIDE TWO**

MR. THOMAS OVERTON: ...you'd end up out 300 feet. It was crazy. We would never, you would never do that now. I did one day. I actually saved one guy, he was held a screw down, screw jacks, that screwed downwards and the problem with them is their silent, and there's no hoist involved. You don't hear any grinding noise or anything like that. You're back there and you push a button and the screw jack will fold down from a horizontal position to a vertical position down.

Well, there was a guy standing there. I was facing it and the guy announced, you know, we're gonna lower to protect so and so, and the guy had one foot on the screw jack and one foot on the platform. He heard the guy give the warning, we're gonna operate the screw jack, so he moved his foot back two feet on the platform, so he standing there, and he's okay, and the screw jack going down, but he forgot -- and he stepped back.

When he stepped back, I forgot which foot, hit the screw jack that was going down and he lost his balance. He reached out and I grabbed his hand. I pulled him back up and we both about had a heart attack. He would have fallen 300 feet. Actually, it's 20 feet approximately. Now see, I'll probably get in trouble, cause we never reported that. That's your limitations.

DR. ORVILLE BUTLER: You were involved in Columbia recovery and for that reason I wasn't going to start off with Challenger. What were you doing when Challenger happened?

MR. THOMAS OVERTON: I (inaudible) here to give tours to people and I, that's one of the duties of the site was a planner, of course, and doing the scheduling. By the time launch comes around I'm not active in the firing room or anything. I don't have a particular job so our office here hosts the astronaut families. We host the children, the immediate families of the astronauts and the VIP's. Whether it's the President of the United States or congressmen or whatever. So, I've always been a volunteer to help out and I was with some guests down at the barge canal.

We had bleachers set up down there for the VIP's to watch the launch, so I was with some VIP's which I was escorting. Included in the group were Christa McAuliffe's mother and father, Barbara Morgan, the alternate astronaut school teacher, and her son, Scotty and about a dozen or so thirteen, 4<sup>th</sup> grade kids from his class. We were down there watching the launch.

So, unfortunately when it blew up, I knew immediately that they were lost, and I remember the first person to say anything to me was Barbara Morgan, who came down from – I was standing in front of the bleachers down there in the roped off area – and they were, all the family and her parents too. I don't know if I said that or not.

We're up in the bleachers and Barbara Morgan came down to me and said, what's happened? And I said, we've lost them.

I mean, not that calmly, you know. And she said, what do you mean?  
And I said, they're gone, we've lost them.

And she, everybody then thought perhaps, you know, NASA always has some miracle they pull off, seems like. I think everybody in their heart thought, maybe they'll somehow be some parachutes out there, and they'll come floating down and everything will be okay.

But I knew that was not going to happen.

So, what do you do in a case like that then. We changed it since then, but they put everybody in the bus and, I didn't go with them. I don't know exactly why. I was with someone with public affairs or the professional... I wasn't responsibly for them. I was more of the technical, like answering questions.

Public affairs, the professional people that were with them, put them all on a bus and took them over to the ONC building, I believe. (inaudible) and I can't shed any light on who said what to who, or anything like that. But all I know is I was – it was devastating to me. I'm no different than anybody else. I cried and I was just terribly, terribly upset.

For the first time I don't think I slept in two (2) nights. I mean I may have closed my eyes but I just tossed and turned and it was really a bad situation. Anyway, that's a personal thing but you kind of get over it, if you can, I guess. I was hoping I would never - I've had dreams about launches coming back on you, or something like that.

I think everybody who works out here, and some that don't, have those kind of dreams, probably. I don't feel like it has affected me in any way over the long haul. It's something I'll never forget, but it doesn't affect the way I live now but it was a pretty traumatic thing. I was glad when they figured out quickly, what the problem was and that made ya feel better.

Of course, I was scheduling the launches then, so the busiest time was when we had was Return to Flight. Both Challenger and Columbia. I mean it's like, things are gonna slow down, we're just waiting on the (inaudible) or the redesign or waiting on the SRB segment joints to be redesigned. And so there couldn't be much to do. Everybody needs to know.

DR. ORVILLE BUTLER:                   What was involved in scheduling for 26R?

MR. THOMAS OVERTON:               Well, I think it wasn't more than two (2) or three (3) days till they said, you know, we've got to have something to plan on. We're training astronauts. It's such a big thing. Said, what's gonna happen to the program and they said, you know, certainly we're gonna launch six (6) months from now. We'll redesign everything and have it ready in six (6) months. So, we build that manifest.

Then you start saying, well, there gonna take more time for stacking. We know that. We actually stacked in five (5) days. The whole stack, it's already stacked at four (4). Challenger did not take us 19 work days, which is 20 some odd days, so it's like four (4) times as long (inaudible).

DR. ORVILLE BUTLER: What caused that change?

MR. THOMAS OVERTON: Actually there is work to do, there is more inspections to do before you stack. There actually more physical work to do. There's a devise that covers or protects the joint against contamination and things like that, that we didn't have to worry about that were just (inaudible) to do. And so we couldn't stack, you know, a couple a day. Now, it's like one (1) a week, maybe two (2). It's just a lot more requirements. A lot more work to be done.

Same thing happened with the orbiter. We did the orbiter, we processed an orbiter in 26 days, was the shortest run, and nominally we can do it in about 30 days. Now it's 90 days. Three (3) times as long. There's more requirements. More testing requirements. Some things that their working in space, you assume their working again, and you don't check them out again until you get to the pad or something. Now we check them here, we check them in the OPF, we check them in the VAB. We check them at the pad, you know, just a lot more testing involved. That's a redesign. It's more complex.

One of the things we had an 80 day, like we have a generic (inaudible) flow for the lunar (inaudible). It used to be 30-something days, then it went to 80, now it's 90. The reason we went from 80 to 90, was they just redesigned the heat shields on the engines, and they redesigned them so that it just takes more man power, more time to unbolt them, take them off and remove the three (3) main engines, (inaudible) and bold the heat shield back on again.

That went from just a few days to five (5) or six (6) days, so you gotta add time for that. That's just one of the examples. There a lot of things like that.

There's gonna be a lot more changes after Columbia. Don't know what they are right now, but yeah, they then go for maybe a week or so, and somebody says, well, maybe it's gonna take longer than that to do the SRB, redesign, so we're gonna add more time in there. Then they add time.

Then you gotta go check with all the other payloads, then some committee will say, well, we're not gonna fly on commercial payloads anymore. Oh, now what are we gonna fly. You know, we don't even know what payloads we're gonna have, you know. It's amazing, but you just continually do manifest options.

We just did a little survey. I think about the First of July, we had done 50 in-depth manifest options since February 1<sup>st</sup> of this year, so, I mean, that's a lot of options.

DR. ORVILLE BUTLER:                      Were you involved in any of the recovery efforts for Challenger?

MR. THOMAS OVERTON:                      Not for Challenger. The only thing we did, they had everybody go through the hanger. It was kept a lot more quiet. (inaudible) took pictures of parts and it was, a completely different attitude, it was, to me. I mean not completely different, but much more restrictive, much more than we talked about.

They did let us go through the logistics warehouse down here, where they had all those people who wanted to go through and look at it. I remember the most,

the thing that I remember is the smell. Of course, being at the bottom of the water had all these barnacles on it. You think, how in the world did all these barnacles get on all this. And the barnacles themselves smelled. They were dying and they smelled like seaweed or something, you know. Pretty morbid. There's this ship, all of a sudden, this spaceship is dying right in front of you, you know.

I didn't have anything to do with recovery of Challenger, but a lot to do with planning of the first mission after Return to Flight. Doing all the mods and estimating all the hours it would take, and coordinating all that stuff.

DR. ORVILLE BUTLER: Let's jump up to Challenger, ah, Columbia.

MR. THOMAS OVERTON: Okay.

DR. ORVILLE BUTLER: Obviously when Columbia happened it wasn't quite the same visual event. We didn't have the big crowd here to watch it launch, and do you remember what you were doing when you first heard that this return had failed?

MR. THOMAS OVERTON: I sure did. That's one difference between the two (2). It's like seeing an auto accident happen in front of you, and seeing a (inaudible) blow up or something or reading it in the paper. It's a lot different when you're there and you see the accident, the one you read about.

And Challenger, you were there, you saw it. You saw it explode and that's one of the reasons it affected so many people in such a dramatic way. Whereas Columbia, it just didn't come back, and it's not any less from a tragedy (inaudible). The

affect on you when you don't see it, it's just an absence of something, you know basically. So it wasn't as traumatic - that way as seeing it happen right in front of your eyes.

I was at the runway. Again, I was escorting. I was escorting a lady whose husband was killed on the USS Cole, by a terrorist attack. She had a 14 year old son who was depressed. Anyway they were friends of Bill Reedy (phonetic), the Administrator, who was a Navy man, and this widow, of course, was a Navy family, and as friends they invited them down to see the landing and I was escorting them.

I picked them up at a hotel in Cocoa Beach and took them out to the landing site, and I was with them and Bill Reedy (phonetic). Do you know who Bill Reedy (phonetic) is as far as the - he's the co (inaudible) man guy in manned space flight head in Washington, D.C. He's the program station, program manager's boss.

Anyway, and I had brought my son, who is also in the Navy, out here to see that landing and Bill Reedy (phonetic) was gonna take this young man down to the orbiter when it landed and kick the tires so that - that's what we call it - kick the tires when it stopped.

Course they go in and safe it, and all that first, but then, before the astronauts get out, you go down there and get a first hand look at it and he was gonna take my son, and this young man, and so, we were hanging close to Bill Reedy (phonetic) and I mean, it was a beautiful day. We knew it was coming back. All the families were there right beside us, I mean, in the bleachers, and the families. We kind

of keep them separated so people won't bother them and all that, because there were a lot of spectators. I don't know, maybe 1,200, something like that.

I was excited because Bill Reedy (phonetic) said that my son could go down with him, cause he kind of formed a little repiore with this young man, he kind of befriended him. He was kind of lonely or something and so Bill said, why don't you just have your some go down with us, that'd be okay. Great, that's wonderful, you know. The press is there - cause they'll probably show, you know, probably see my son, Michael walking around there.

So, I just introduced my son to Sean O'Keefe, the Administrator and the Administrator was very abrupt, and I've taken him on and his family on tours here. I took him and his wife and three (3) kids on tour. Very friendly, very - he was a politician but he was still sincerely just (inaudible) with people. And I introduced him to my son. He was like, kind of abrupt. I said, Michael something's wrong. He's not like that. Don't judge him, there's something wrong, and I could tell he was upset and I looked over at the clock and it was like 15 seconds to landing - there's no sonic boom.

Michael said to me, before I said anything to him, he said, Dad, isn't there supposed to be a sonic boom? I said, yeah, we should have heard it. Something's wrong, but still in my mind, Nah, NASA's not perfect. They must have miscalculated, give it a few seconds, it'll come in. Just a little hint of maybe, will, maybe something happened. Nah, I don't think so.

Then Pam Adams, she's a public affairs person, who kind out looks out after the Administrator, high rollers, she had a radio, and she just had this terrible look

on her face and then I saw Mike Wetmore, who is the operations - head guy over at Headquarters there. And he says and there's no.... I heard him talking on the phone, and he said there's no way they could have made it? He said, I didn't think so.

Gosh, it's happening again. I never thought it would happen again. I thought I'd retire and it wouldn't happen. I might watch – this has never happened. I couldn't believe it – on such a pretty day. I was, it's happening again, God no, not again.

He had to go take a flight back to Corpus Christi and I had to take this lady and her son down to the hotel. I was crying. I was trying to keep to myself, but I was sitting in the back with this young man, and I could see his mother and the driver were in the front seat, and we're headed for Cocoa Beach. I remember be just fidgety and just upset.

Not crying boo-hoo, but not myself - and we stopped the car at the hotel and the kid reached over and he patted me on the leg and says, I know just how you feel. Oh My Gosh. This kid lost his Dad in the USS Cole, and he does know how I feel. It just touched me, I'm mean, I'm telling ya. It touched me, and the mother she consoled me. She hugged me and said to tell all the guys you work with, we'll be praying for them. I thought, man, isn't that – that was the neatest thing.

I'm out here escorting her and she cheered me up as much as possible in the - as much as you could be cheered up, but she was, she knew it was bothering me so much and she just had this real compassion, you know. I thought it was just really, really great.

She had her tickets and I don't know how she got to the airport and all that. I did what I was supposed to do. Came back here and came to this office and they set up a, right across the hall over there, they set up a type of (inaudible) type thing. They put somebody on the phone, that was where they got in touch with everybody, and (inaudible) had to go to the bathroom and so. I went in there and answered the phone - and he said, this is Tom Ridge- it didn't ring a bell - I want to talk to so and so. It could be the Tom Ridge, so then I realize, oh gosh, I'm talking to National Security, and so I go downstairs and he comes up and answers the phone, I said sorry, I'm just a small in this whole scheme of things.

Everybody was rallying, trying to figure out what they were gonna do and some of the guys went out to Texas immediately. Course I know the FBI and all that, particularly in the remains area - quickly get that taken care of. That was the primary thing. I probably went out after that for a two and a half (2 1/2) week period of time.

DR. ORVILLE BUTLER:                      How were you selected?

MR. THOMAS OVERTON:                      All of us were asked if we wanted to go out. All of us in this group. There's probably 10 or 12 of us here that worked for Jeff next door. Then there were some guys down the hall, test conductors and stuff that went out. Most of the operations guys.

Well see, we know families. I don't know if that's a criteria or not, I may be imagining that, but some came here to this office, and they actually literally move into this area, the families before the launch, and they go up on the roof here to watch. And tests, test (inaudible), we have to work with the guys, (inaudible). The astronauts

are here, the kids are across there coloring and putting stuff on the drawing board, right across the board, right across the hall over here.

It's like family and I don't know what they thought - it was therapy or whether they just thought - well, you guys are familiar with parts of the Shuttle and therefore, we need you guys to go down there, rather than have the Forrest service pick up something and try and decide.

I mean, obviously you do have to have people who know what the Shuttle looked like, so. Maybe, I think it's a combination of the two. At first, I thought I don't want to go down there, then I thought, I think I ought to go down there. I'd feel better about things. So I said I'd go. They seemed to be happy about that. I mean they wanted me to go down there, and they seemed to be really happy about that.

So they sent me to, of course, to Cannon (phonetic), which was the western most, or the early stuff that came down. Not the earliest, but as far as the major cover sites, it's the earliest one. Course about 45 miles south, east of Dallas and (inaudible), showed 'em my badge. I got there about 6:00 o'clock in the evening. (inaudible) Shreveport, 150 miles. And I worked that night. I worked 13 hour days, at least, that what I charged. I worked 14 or 15 hour days, straight through, Saturday/Sunday.

No time for sightseeing. I didn't want to site see. I wanted to get home and get to bed. I mean, you know you were just too exhausted to. I mean, but what an interesting experience. You picture your (inaudible), what am I gonna do? Am I gonna work in a hanger, am I gonna go out and search for cards, what am I gonna do?

First day, they had me working the hanger. I got a little bit bored. I think I want to go out. Okay. Next day you can go out. So, I went out and I stayed out. I didn't want to work in the hanger anymore. I searched everyday. Even as heavy as I am, I walked the fields. We walked for miles and miles and miles.

DR. ORVILLE BUTLER:                      How did they set up the search?

MR. THOMAS OVERTON:                      The firefighters did a fantastic job. You may have heard that. What they do is, they have a NASA guy and a EPA (or EVA) guy. The EPA guy carries a GPS recorder and he has an assistant too. There's kind of like three (3) of us that are government. He, the (inaudible) expert to identify the source, see if it's safe. Say, yeah, we got to keep, we got to package it, and the EPA guys would then take the readings, write down all documentation. I would sign it as a piece of Shuttle, and then you had the searchers.

There would be 20 guys to a team. I had 20 guys on my team and what you do is you spread 'em out and check for your part and you, ideally you got a pasture. I mean, we had the roughest terrain I've ever seen in my life. I'd rather walk through a Florida swamp than through the stickers that were two (2) inches long.

We had to wear hard hats, safety goggles, chaps, special boots, fire retardant shirts, the whole bit. Well I thought, okay, here's safety overdone. I mean, we needed every bit of that. I was so glad that I had goggles and a hardhat. It was, it was rough. It was not easy at all.

You line up in a field and you have the what they call, not the driver, but they had a guy who was in charge of all the firefighters, and whoever was in your

group. They used Indians. They used all kinds of people, but they'd say, okay boys, space it out, space it out. All right, we're ready. They'd have, if they had (inaudible) over here, the guy on the left would have a whole bunch of little spikes in his hand of this little red taped flag – and every hundred feet or so he'd plant one.

So, if your going down in a straight line, (inaudible) flag one. You look to your left, you look to your right. Find the good stuff. He said that ten thousand times. And he'd walk all the way to the end of this field, or wherever the end of this march was and then he'd shift down and then the guy on the left side would follow those flags back to make sure we covered everything. He'd follow those flags and he'd pick 'em up. The guy on the right side would be planting 'em again. He'd turn around and go the other way.

He'd do the same thing. Back and forth and back and forth. All day long. We had a, we actually were pretty efficient. We actually got in to the Palestine (phonetic) area and we're doing some of theirs that they didn't have time to do, but anyway, we covered a lot of territory. Found a lot – we found over a hundred parts in that period of time. Saw the RCC, wing panels. I knew they were critical. We fast tracked those.

That's means we don't put them on the old truck and wait until Thursday to send it. We fast track 'em and they fly back because they may be critical to the (inaudible). But, exhaustion. I had a couple functions. If I'd find this (inaudible). Somehow this is too much, you stop me but.

DR. ORVILLE BUTLER: As long as you have time, we can.

MR. THOMAS OVERTON: Okay. Got a couple stories. Well, the guys all wanted to find something, so there'd be one (1) person that hadn't found anything and he'd be finding something, and he didn't know whether it was a piece of Shuttle or not. I knew a piece of back tubing could be to anything, but we learned that there's a telltale coloring, in a rainbow color, when stainless or some of this titanium, or really fancy metals get super heated to like 3,000 degrees. There's this rainbow color around it.

You see it on almost every (inaudible), some of this stuff, and there's no way that's gonna happen with some (inaudible) (inaudible). Its gonna be rusty, so you can tell, even though I can't identify the part.

But the guys would find a piece down there and he found that little thing and I'd say yep, take it, let's show 'em. He be jumping up and down and all happy to find something and sometimes you'd find, I mean, everybody knew. You'd find a whole pile with silver on it –sitting right there. We found one (1) sitting on a cow pie and I mean, like a bulls eye.

We had one guy, had to take a break, and went down by the river to do his personal business. Squatted down there and reached around – there's a tile right there beside him. Picked it up, brought it back to us. Don't know how we missed it because we'd been through there. It's very interesting. I'd get home at night, 8:00 or 9:00 o'clock and, we weren't about to go anywhere, just crawl in bed, tried to watch TV, but you're so exhausted.

They'd feed you 2,200 calories a meal. It was like, ridiculous.

Sandwiches were 13 pieces of meat on it. Somebody said that with the firefighters, they have to eat so much food because their burning up energy fighting fires so they, they really pack their lunches. The lunches weighed so much. It was, but anyway, that something, I didn't eat that much. I always took water and everything, you know, a lot of water.

I'd like to share one (1) thing, just a thing that happened. We were walking through the woods, we came upon this real quaint little house and it's new and they've got the yard part of it was way back in the thicket. They've got grass growing in the yard so I didn't want to – normally we don't stop for anything.

We go over everything, over every inch, if we can. So, he has all these guys are traipsing through this yard. I went and got the woman and she, I said there's two (2) of us, we'll walk carefully through your yard and make sure there's nothing there, cause it was easy, cause the grass was cut. Sure, we appreciate that, cause we were wondering if you NASA guys would be coming.

By the way, you don't have to work for NASA to be a NASA guy. Everybody out there was a NASA guy. So there's no distinguishing between contractors or anything. I've never seen a closeness and a striving for a particular goal. Must be like that when you put out fires. I mean, they must all- there all gonna put out the fire, and I'm sure it's a similar thing.

But anyway, she says, I was wondering if the NASA guys would come. So we went and looked, cleared her yard and everything. She sees these guys marching through the woods.

So she says, you know, I bake bread, and I can bake about 5 loaves of bread. How long do you think it would take you guys to go down, turn around and come back? Well, it takes 45 minutes. She said would you mind if I fixed the guys something? I said, No, I think it'd be nice.

So, I had to go tell the head guy. I said, you know this lady wants to fix something for the guys - you mind if we stop? So he says, well, you know, you work for the Government. We'd be cheating the Government out of a half an hour. He said, I think it's worth it, you know the lady is (inaudible), and the guys would enjoy it.

Course I didn't know if the lady would do that or anything else, but I figured it was just the right thing to do. So, we come back. We didn't tell the guys. We go back up through the woods and you could smell the bread in the air. Man, that smells good. What's that good smell. We're looking, getting distracted.

Finally, we go up near the house and she's there with five (5) picnic tables in the back yard. She's goes get these five (5) loaves of bread, with golden butter. She's got cookies. She's got cake, ice tea, lemonade, sodas, and then she's got a garden hose draped over so the guys didn't have to go in the house, cause we looked - I mean we looked terrible. Mud all over our feet. I mean just crummy looking.

So, we could wash our hands right there, sit there and we had fresh hot baked bread, jam and honey. I mean it was the nicest afternoon tea you'd ever want

to see. And these guys were so grateful, they - each one went up to her and thanked her. I had to give them a little coaching out there. Sometimes their language was a little powerful, and now this lady is doing you a favor, and I was trying to watch their language real good. I mean, they were gentlemen, just. It was a neat story and it was worth taking a half an hour of our time to go do that with that lady.

And we got chased by a bull. We had one time, the farmer says, I got a bull out there - and he called us. We had to go to his farm. It had been searched but apparently they missed a piece and we go up the fence and I see the bull, he's quite a ways away.

What about the bull? Oh, he's okay, he won't bother ya. Okay, sure no problem. So we had to go this way and go down the hill a little way, and we're kind of looking back, and we get all the way out to the middle of the pasture and we're taking the GPS numbers, and we look up and the bull's not running, but he's walking toward us, looking right at us.

So, we kind of hurried up a little bit and we started pacing towards, back toward the fence and the bull is coming towards us, and we - you calculate in your head, okay at the pace he's coming, and the rate that we're walking, he's gonna intercept us before we get back to that gate.

So, you start walking a little faster. He's starts going a little faster. Eventually though, we picked up the speed and, I think all but one (1) of us ran back, and the bull came after us. I don't know what he'd a done - but we're not cowboys, so.

Okay, enough of that. It may not be the technical information that you want, but its kind of a human story, so it might of some interest to somebody.

DR. ORVILLE BUTLER: Sure.

MR. THOMAS OVERTON: We come in at night, we'd drive back, it would take us about an hour and a half to drive back from our search area, back to the encampment, which was at a cotton processing place that was empty. They had these big cotton warehouses, unairconditioned and the Indians and the firefighters and that, camped out in there, inside the building – kind of unique. They fed everybody there and all that. 1,200 in our camp site.

DR. ORVILLE BUTLER: And you had about 20?

MR. THOMAS OVERTON: And I had about 20, so that gives you an idea about how many, what the ratio was of, you know (inaudible). We'd take our loot, stuff we found and then I would stay, usually stay later because then I would go through and see what stuff had to be (inaudible). We'd get everything - came through one little section there, and so all the 1,200 guys that were searching would bring their stuff.

We'd go through and see what needed to be fast tracked. We'd try to identify it. We'd sign our name to it. We'd make sure there were no (inaudible) or anything and fast track certain things, so then we would put stuff on a table for everybody to view. Particularly the big items, big pieces of tile, whole tile or RCC panels, stuff like that. We'd put out on this table. It was called the VIP table, Very Important Part. It was mostly kind of big stuff, don't know how important it really was,

but guys would love to come through there and see what other people had found and it was an experience.

I'll never forget and I was just so glad. I don't think I've worked so hard in my life, my legs ached. They told me my job – the guys, the 20 guys- now we'd become good friends. I'd followed some of their careers. They sent me stuff and I'm a member of the – see, I can't think of it now, it's a town in Montana and there the firefighters there, and everything. They made me a member of their fire fighting team and we exchanged photographs, and I sent them patches and stuff like that for Columbia. Pretty neat experience.

DR. ORVILLE BUTLER: Some interesting connections. I teach at Montana State University (inaudible).

MR. THOMAS OVERTON: Oh, is that right?

DR. ORVILLE BUTLER: Um-hum.

MR. THOMAS OVERTON: Well, you probably know the name of the town. It's.

DR. ORVILLE BUTLER: The other thing, I got my PhD at Iowa State.

MR. THOMAS OVERTON: You're kidding.

DR. ORVILLE BUTLER: Yeah.

MR. THOMAS OVERTON: Did you ever hear of (inaudible) Hall?

DR. ORVILLE BUTLER: Oh yes.

MR. THOMAS OVERTON: That's where I lived. Yeah. Montana.  
It's a small world, isn't it? Anaconda (phonetic).

DR. ORVILLE BUTLER: Oh, okay.

MR. THOMAS OVERTON: Yeah, it's the Anaconda Firefighters. So I remember that. Taken the YNID, the group investigating, you know to the hanger, so I spent quite a bit of time in the hanger over there where Columbia is. Explaining the parts, (inaudible).

DR. ORVILLE BUTLER: Are you involved – or are you familiar with the investigation process, and what they are going through in trying to figure out how the accident occurred?

MR. THOMAS OVERTON: The only thing I can see is what other people have told me, and of course, first hand knowledge would be better, but I mean they, you know, they pretty much zeroed in on it and a lot of it had to do with when they launched the measurements. Because there's a lot of sensors and everything on the left hand wing and the wheel well and the tires and all that.

The tires blew and lost pressure and all that, so they kind of knew first off and so they have to size the left wing area and then looking at the data - then they found that box, what's it called - the data recorder. And you know, and it had extra time on it. Time that they had, not real time data, but recorded time, that they can get the last 34 seconds and then also confirm (inaudible) measurements at certain times so they can almost track it as it progressed through the wing itself, down through the wheel well, and so they know the source.

Now if you go over there and look in the hanger and you see where they've got (inaudible) in there, the three dimensional set up, the big plastic, and they got a piece of RCC bolted on there, where you can see like eight and nine, there's not much left of those.

So it's pretty certain, I mean they know exactly where the culprit was, so looking at the slag and the materials as it progresses down, they analyze the material that imbedded on certain pieces within the wing and all that. They pretty much know exactly what happened. It's fascinating to me.

DR. ORVILLE BUTLER: Do you know of people that we might be able to talk to that are involved in that area?

MR. THOMAS OVERTON: Well I know the guy, the heads up the whole reassembly effort, (inaudible) is right down the hall. And the guy was just out there checking out our government cars, the Launch Director and, (inaudible) and he was in charge of the recovery all together, the whole thing. I should have hollered at him.

DR. ORVILLE BUTLER: Our people will probably interview him when we're back down here in January.

MR. THOMAS OVERTON: That will give you a lot more overall than I know, because they are more directly involved. Altemus is, A-L-T-E-M-U-S. He was in charge of the hangers. But he can direct you to people like, technical people that actually did analysis and things, (inaudible) and all that kind of detail.

DR. ORVILLE BUTLER: Any other comments about your experiences on recovery or your experiences here in NASA. How do you think this is going to affect future launches?

MR. THOMAS OVERTON: Outside of what we hear about what the CAIB (phonetic) is going to recommend, I mean we have some people that are tracking that. We're trying to get a head start on some of the recommendations.

One of the things that changed over here is we're probably not going to launch at night. We're going to have all daytime launches, so that's a direct influence. The reason of course, is because the cameras that took the videos between the SRB and the external tank to look and see what falls off or what doesn't fall off. Then there gonna have some kind of – the station itself is going to be, oh boy, what's the word, safe haven, is all I can think about. It's gonna be a safe haven, so what we'll do is we'll launch and then within hours we'll know how successful with regards to a damage to the orbiter, due to surveillance, due to DOD's participation, and (inaudible) about that, and other means that we have using lasers and different things to check the (inaudible) in the wing and that sort of thing. All that's gonna be done.

If we have a problem, it's questionable about it coming back, we'll put them onboard the Station and they'll stay there until we either bring them back in Soyuz's (inaudible), or send up another orbiter. And of course that's (inaudible). You send up another one, (inaudible). Things like that we're not going to, we're taken out of service for a period of two (2) years.

We used to overlap 'em, when we had four (4) orbiters and we would like take one (1) down before the other one was ready. Well, that won't happen now because we're only going to have two (2) orbiters. You always want to have a rescue vehicle. So, that changes things.

We're talking about HST, which is the Hubble – we got a service mission that's going up in May of 05. There's no safe haven for it. The guys that go up there, there's no place for them to go. If something happens they can't go over to the Station and wait for somebody to come and get 'em or anything like that. They have to come back right away – not enough oxygen to stay up there. So, we'll probably end up launching, having the capability of launching four (4) days after the first one, so we'll have to have one (1) on each pad. And if the first one HST is successful, we'll delay the other one for a month and go ahead and let Space Station can (inaudible), it was gonna go up there.

If they have a problem, we'll start the countdown the day after launching HST and count down to three (3) days and launch, and we'll go up there on the fourth day and (inaudible) and bring 'em back. The question is, what do you do with that orbiter?

Probably though, in a situation like that, well, that's another thing, one (1) of the things we're gonna change is there gonna try to figure out some capability of repairing an orbiter. Their even toying with the idea of, did some experiments on Soyuz. They could go up, (inaudible), transfer some people, then come back. Put something on the outside of the Soyuz to see how there's a fix. If there's a kind of a

liquid you can apply, it gets hard and it would attach so that we can get back safely, you know. We were talking about those kind of experiments, to reenter the atmosphere. There's a lot going on. Their talking about stacking the Station with more logistics, more water, in case we have to stay up there for a period of up to 120 days. A lot of changes, potential changes.

DR. ORVILLE BUTLER: Well, I think we've used up our time.

MR. THOMAS OVERTON: Okay.

DR. ORVILLE BUTLER: Got quite a bit more. I certainly thank you for taking the time to talk with us to us. It's kind of interesting. You told us some interesting stories.

MR. THOMAS OVERTON: I'll think of a lot when you leave. That always happens.

DR. ORVILLE BUTLER: That's quite all right. If you.....

Thereupon the interview ended