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AN ORAL HISTORY

with

MR. ROY ESTESS

Interviewer: Dr. Henry C. Dethloff

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Biography

Roy S. Estess, a native Mississippian, is Director of NASA's John C. Stennis Space Center (SSC). He is responsible for accomplishing the Center's current missions which include support of the Space Shuttle Main Engine (SSME) test program; planning and implementing advanced propulsion test activities, including the New Launch System (NLS), the Advanced Solid Rocket Motor (ASRM), and the National Aerospace Plane (NASP); conducting research and technology development in earth and environmental sciences; commercialization of remote sensing technology in cooperation with industry and academia; technology applications in propulsion test and launch operations; and management of the total Center in support of NASA programs and the programs of the other eighteen resident Federal Agencies.

Estess graduated from Mississippi State University with a degree in aerospace engineering. He also has accomplished various graduate level studies including completing the Advanced Management Program at the Harvard Graduate Business School. He is a registered professional engineer in the State of Mississippi, and is Chairman of the Advisory Committee to the College of Engineering at Mississippi State University. He is also a member of several professional societies including the Tau Beta Pi; AIAA; Mississippi Academy of Sciences; and the National Space Club, of which he is a member of the board.

He has held various engineering and management positions during his thirty-three years of service to the United States government, of which twenty-nine have been with NASA. From 1980 through 1988, he was deputy director of the SSC prior to becoming director in January 1989. In 1992 he was temporarily assigned to NASA Headquarters, Washington, D.C., as a special assistant to the NASA Administrator.

He is the recipient of numerous awards and honors including the Distinguished and Meritorious Senior Executive award; NASA's Distinguished, Exceptional, and Equal Opportunity Medals, and Alumni Fellow of Mississippi State University. He is active in church and community activities. Estess and his wife, Zan, reside in Pearl River County, Mississippi.

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ROY S. ESTESS

This is an interview for the Stennis Space Center History Project in conjunction with the Mississippi Oral History Program of the University of Southern Mississippi. The interview is with Mr. Roy Estess. It is being recorded on June 18, 1991. The interviewer is Dr. Henry C. Dethloff. Also present is Mr. Mack Herring.

Estess: I grew up in Walthall County, W-A-L-T-H-A-L-L County, Mississippi. Graduated from Mississippi State in aerospace engineering.

Dethloff: When did you graduate, may I ask?

Estess: Nineteen sixty. They called it aeronautical in my day. Now they call it aerospace.

Dethloff: Yes.

Estess: And I went to work for geographical reasons in the southeast. I wanted to stay in the South. I went to work for the Air Force.

Dethloff: OK.

Estess: In Mobile, Alabama. Brookley Air Force Base. After four or five years, Robert McNamara made the decision to close that base.

Dethloff: What were you doing at the Air Force base?

Estess: I was a design engineer. Primarily what I was doing was designing repairs for damaged aircraft.

Dethloff: Oh, OK.

Estess: I started off as a young engineer repairing simple structural cracks. And the last aircraft I did for the Air Force before I left there was brought in on a carrier in three pieces. I did the design work to put it back together.

Dethloff: That's interesting. What division is that, ONR, what do they call that?

Estess: Well, in those days they called it the Air Force Logistics Command.

Dethloff: Logistics command.

Estess: Yes. What you may be referring to was called IRAN. Inspect and Repair as Necessary, I-R-A-N.

So after they closed that base my job was transferred to Sacramento. And I refused to go to Sacramento. I found myself a job in Georgia.

Meanwhile it was—to back up to Brookley—I had spent about a half a year at Nellis Air Force Base out in Nevada during that tour on a special project. I transferred to Georgia and was over there for about a year, again doing special projects. Got a little bit out of the air frame business and got into the systems business. I had several projects that turned out to be historically notable, that I'm pretty proud of. One is that I designed the installation and actually oversaw the installation of the weather recon gear that went into the C-130 that flew support for the Gemini launches off the East Coast. The Air Force did the weather recon work, and I designed the installation of the weather recon gear.

Dethloff: So this was basically your first real introduction then into the space activity and operations.

Estess: And I was disjointed from it, but I was associated with Gemini from afar in the Air Force support. And it was the Radioson Installation and C-130 Aircraft to support launch operations. I'll bet you didn't know that.

Herring: I didn't know that.

Estess: So that was my first introduction to the fact that there was a space program. The second project that I was involved with there was more notable in terms of how many people know about it. I was the project engineer for designing the installation of Gatling guns in C-47's—the "Gooney" birds.

Dethloff: Oh, yes, is that right?

Estess: In the C-47s that were used in Vietnam.

Dethloff: I remember hearing about all those things.

Estess: And it was dubbed "Puff the Magic Dragon."

Herring: I remember that.

Estess: So I did all the major design work and was the lead engineer on that project. The first time I ever got my name in the *Aviation Week* magazine.

Dethloff: Well, I'll be.

Estess: I still have that old *Aviation Week*, Mack.

Herring: Gosh, that's historical, you need to donate that.

Estess: I've got it. So at any rate, Henry, I was enjoying myself as a young engineer involved in what was my first love, aircraft. Two circumstances existed—really, just one. My wife was unhappy in Georgia.

Dethloff: I was going to ask you if you were married at that time.

Estess: Yes. I had a wife and two children. Two small children. She was unhappy but I was having a great time.

Dethloff: Is she from Mississippi?

Estess: She's from Mississippi.

Dethloff: OK.

Estess: And she had enjoyed it in Nevada and in Alabama, but she didn't like it very much in Georgia. The primary reason was that we moved out of a brand new house into the only thing that we could find, which was very old. And she was just not a happy camper. She was about twenty-five years old at the time. But at any rate, I was having a good time and was not even contemplating any interest in the space program. I got a call one night from an old college acquaintance, and a guy that I had worked with formerly, who worked for the Air Force also. He works here now. His name is Glade Woods. And Glade Woods called me one night about nine o'clock, and I hadn't heard from him in a long time. And he called me up and said, "NASA is putting together a group of engineers down here in south Mississippi to test rockets." At that time he was working at Michoud for one of the contractors. He said, "I'm going to go over and go to work for them there. Why don't you come down and take a look?" I said, "Glade, ole buddy, I don't know a thing about rockets. I'm an aircraft guy." And he said, "Well, it's going to be pretty interesting. They are going to the moon." I said, "I heard about that. But I'm sort of into this airplane business." And that was in November. And in December he said, "When you come home for Christmas, why don't you just come by?" So I came down here, I drove down here at Christmas time and talked with several people including Glade, Doug Howard, Merle Sanders, and Bob Bush. And wound up in February 26, 1966, coming to work here as part of the S-II testing team, the second stage of the Saturn V.

Dethloff: And they were just getting ready to start their first test, right?

Estess: Just getting ready. April was their first test. Which was just a fifteen-second test. For the first six months we went to school about six hours a day, and we worked about six hours a day. NASA provided a very intensive retraining process that we went through. So I spent the next several years of my life really as part of the S-II team, that is the second stage test team. Of course, the contractor was doing the testing and there was a small group of NASA test engineers that were responsible for working with the contractor. Monitoring their activities, approving—

Dethloff: So you were sort of the contract manager, the project manager for—

Estess: Project engineer, project manager. And each one of us had a discipline that we were responsible for. I worked structures, the thermal protection system, and the propellant feed system over those years. So we did our thing and got all the vehicles tested to go to the moon.

In the meantime Jack Balch was doing his thing. He could foresee that there wasn't anything on the drawing board for this place past Apollo. So he was actively trying to figure out what could be done with this investment. Jack enjoyed the challenge of trying to save the place, save the world. And he enjoyed the ability to work with the Congress, particularly Senator Stennis. He was very powerful even at that time, Chairman of the Armed Services Committee. And so he [Balch] threw his energies behind that effort. I was on the testing team and Balch knew me, but I don't know if he really had ever made an assessment of my abilities.

And then there was an event that happened, I guess, in 1969. Let's see, Mack, we really started—I'm trying to recall. Balch had me on a couple of little committees and teams and so forth.

Dethloff: There was a project—what did they call them—program or project team organized about '67 or '68. I don't know if you were on it. But it was apparently to begin to assess, well, what we might be able to do from here. That kind of thing.

Herring: I just run across this little mention of that in some—

Dethloff: It might just have been a day or two. I don't know.

Estess: I was involved in that. I don't remember how official it was, because I remember going to the first meeting of what ultimately resulted in this ammunitions plant being built. In 1969 there was a meeting called “Steel City,” the “Metal Steel City.” The Army came in and it was the first meeting that ultimately resulted in the Army building the ammo plant. It took seven or eight more years for the decision to be made.

But what really happened to focus Balch's attention on me; in 1969, I think it was, the agency was beginning to come to grips with where it was going to do its testing for the space shuttle main engine. And they were considering three sites: Huntsville, here at the Mississippi Test Facility, and what was then called Edwards Air Force Base test facilities where we earlier tested the F-1s. And they sent Balch direction from Washington to do a study on what it would take to convert the facilities here to test space shuttle main engines. And Balch turned to one of his people that he had a lot of confidence in, a guy named Mooneyhan. And told Mooneyhan to do that study. And further he instructed him that he didn't want to know anything about it, wasn't interested in it, didn't think it was a long-term solution to the future of this place. That the space business was going to be cyclic.

Dethloff: Now that was Mooneyhan?

Estess: Yes, but Balch was making these comments. Mooneyhan was the guy that he gave the responsibility to.

Dethloff: Yes.

Estess: Because during that same time frame Balch had already started the conversion of Stennis [MTF]. And he had already begun to work towards getting some agencies moved in here and getting NASA to do more. But that hadn't come into being yet. The first one that we were working on I remember was the Lower Mississippi River Flood Forecast Warning Center. Which was a part of NOAA and was located in Rockville near Washington. They thought it ought to be moved down here and it ultimately was. So that was the first agency we really worked on. About the same time the Coast Guard Data Buoy program was focused on.

Nevertheless, back to the shuttle planning. Balch told Mooneyhan to go get in an office somewhere and do the studies necessary to go make that presentation and put this place's name in the pot, as they [Headquarters] wished.

"Don't bother me with it. I don't want to hear about it. I don't want to review it. I'm not interested in it. Just do whatever you have to do."

And it was a display of both his, I suppose, his conviction that space was cyclic and we would go through this again and so forth. And it was also probably a demonstration of his estranged position with NASA. Which had deteriorated some over the years.

So Mooneyhan in accepting that assignment said, "Well, I need somebody to help me." And Balch said, "Who do you want?" And Mooneyhan said, "I want Estess." And so Mooneyhan and I moved into an office together. Our desks were wall-to-wall. And we started working with the support of contractors on making the studies to do the space shuttle main engine testing here.

About six months into the year's activities, NASA decided to establish here at Stennis, what is now Stennis, the Earth Resources Laboratory. In reaction to Senator Stennis' pressure for NASA to do something, to have a presence here beyond Apollo. And so NASA just out of the clear blue sky one afternoon, and without a hell of a lot of thought, created a twenty-five person civil servant organization here with a million-dollar budget to develop applications of Landsat data. In those days we called it the Earth Resources Satellite. And they tapped a well-known JSC NASA person named Bob Piland to head the effort.

Dethloff: I've interviewed him, I know him.

Estess: Yes. Bob Piland. And they told Bob to come over here and set this lab up and build a foundation for the future. And Piland was going to be reporting to the Johnson Space Center. This was managerially insulting to Balch. NASA established it here and they had it reporting to JSC, on the grounds that JSC had an active earth remote sensing program. The Mississippi Test Facility had none. But also it was to show Balch that while he could play the politics, he wasn't going to necessarily control the results.

Dethloff: Was the Earth Resources Laboratory, that wasn't in response to the ten million—yes, this was, OK, this was an independent response by NASA from heat from Stennis.

Estess: There was a nine-page letter written to the administrator of NASA, signed by Senator Stennis and Senator Ellender.

Dethloff: I heard that.

Estess: And the Earth Resources Laboratory was established in response to that letter.

Dethloff: That letter, very good. Thank you, that helps. OK.

Estess: The Earth Resources Laboratory was NASA's response to that letter.

Dethloff: Good, thank you.

Herring: We just ran across that letter today.

Estess: So Bob Piland, again, a notable NASA employee for the task, was tapped to come over here and set the lab up. Now the way that fits into my story is that when Bob Piland came over he said, "Jack, I'm going to come over and do this. We are going to have some ground rules. I'm an independent guy. You are not going to tell me how to do it. I'm going to do my thing. Number two is, I want one of your best people of my choosing to help me." And Balch said, "Who do you want?" And he said, "I want Mooneyhan." And Balch said, "Oh." Which Mooneyhan was one of his best people in his inner circle. "Well," Balch responded, "I'll give you Mooneyhan, but you've got to take another guy." Another guy that he wanted to get rid of. Balch was always deal making. So he gave Piland Mooneyhan but he threw in another guy.

Dethloff: Were you the other guy?

Estess: Nope.

Herring: (laughter) I know who the other guy was.

Estess: No. Another guy. Well, Balch wanted to get rid of another guy.

Dethloff: Oh, OK.

Estess: So in the process then, that removed Mooneyhan from the shuttle study.

Dethloff: OK. That's coming in.

Estess: And left me to complete the study. I'm it. Now Balch just simply wrote me a letter and said, "You got it. Mooneyhan is gone. It's your responsibility." I continued and I finished the study. In December of 1970 we were finally called before the site selection committee in Washington. The day we traveled there is of great interest to me.

Dethloff: Now, say that date again.

Estess: I believe it was in December of 1970. I still have a copy of the presentation. We appeared before the Thompson Committee in Washington. Three installations, Marshall, the Air Force, and MTF. And we all presented our data on why our places should be where the space shuttle main engine testing is accomplished. And that experience is what I think really brought me to the attention of Balch. Now that was a pretty rough trip for me because you remember that he said he didn't want to have anything to do with this study on the space shuttle main engine.

Dethloff: Yes.

Estess: He did, however, decide that he had better go to this meeting.

Dethloff: Oh, so he was with you, OK.

Estess: Yes! So the day that we were to leave we had a driver pick us up which was the custom in those days. We don't use chauffeurs anymore. We had a driver pick us up in front of this building. And Balch and I got into the back seat, and he was an intimidating fellow. But I got into the back seat with him and he said, "What have you been doing for a year?" And I said, "We've put together this plan." And he said, "I'm not interested." We got to just about Lake Pontchartrain and he said, "Let me see a copy of that." So I gave him a copy of it and he started flipping through it. And as he began to get past the background and so forth and get to the meat of it, he began to grunt in his way, which signals to all of us that he didn't like what he was reading. So by the time we got to near the airport he was saying, "Why do you say this? Why this? What is this?" So I could tell we were going down. We got our tickets, we got on the airplane, sat by each other going to Washington. And all the way on the flight to Washington it got worse. By the time we got to Washington he was angry because he said it was a lousy piece of work. When we got there in the cab, we got out of the cab and walked in. I was a thirty-year-old young engineer and he had already stripped me of all my confidence.

Dethloff: Yes, I guess.

Estess: And he told me in the lobby of the Manger Annapolis Hotel that the only thing he knew to do the next day was just go over and confess that he hadn't been involved in this and just deny it. And it was just going to be a disaster and that we'd go back and hope to fix it. So I went to bed—

Dethloff: Feeling real good. Or did you go to bed at all? (laughter)

Estess: I tried to go to bed that night knowing that I was a failure. So the next day we met for breakfast and he said nothing. Got into the cab and went to NASA headquarters. He stood out in the anteroom while our bosses from Marshall Space Flight Center were pitching. And they glared at us as they came out because they had asked to review our documents and were denied that by headquarters. They had also requested to sit in on our presentation and they were also denied that.

Dethloff: Wow.

Estess: So we were a component of Marshall and yet they were not invited to our meeting by the selection committee. Which further alienated—

Herring: One more spike.

Dethloff: Talk about out on a limb, you were out on all sorts of limbs. (laughter)

Estess: Which further alienated Balch. And I was just so far down in the organization that it wasn't—I mean I was just there. Balch further alienated the Marshall people also. Well, at any rate, they ushered me in for what was my first visit ever to the administrator's conference room, complete with a big horseshoe table. And the chairman came over and spoke to me and was very nice. Knowing obviously that I would be nervous. He was very congenial and said, "Hey, this is a relaxed atmosphere. We just want to hear what you have to say. Just do your presentation."

Dethloff: Where's Balch, across the table from you?

Estess: Balch had taken him up a seat against the wall. Not at the table but against the wall. Not saying anything. He did not introduce me. He didn't say, "This is my man. We are here to make a presentation." He just came in and sat down. And I had given my charts to the projectionist and I walked around to the end of the table. Here is a table full of committee and people up to the back row, and this person sitting over on the left had one of these face cones on that every time you said something, he repeated it, that was the recorder. Like a court reporter except at that time they used—

Dethloff: You mean orally?

Estess: Oral recording. Which I could hear because the person was sitting close to me. And every time I would say something that person would repeat it. It was like an echo. And so I was very nervous. I started through my presentation which was about sixty charts. Facilities and numbers and people, pictures, and Balch said nothing. They asked a few questions, obviously to help me. These were experienced NASA people who you read about in the books now, sitting around this table. And they helped me get over the jitters. The more they talked to me the calmer I got. In ten charts I got into it. Had a great exchange with them, went zipping through it, finished it in the appointed time, an hour or so. Answered all their questions. And when it was over the chairman said, "Roy, we appreciate the work you've done. You've obviously done a great job. We just might tell you we think it's the best presentation we've had out of the three places."

Dethloff: This is Thompson?

Estess: Right. And I said, "Thank you, sir." And I gathered up my little stuff and I—

Dethloff: And Mr. Balch is sitting there during that. (laughter)

Estess: And never said a word. He hadn't said a word the whole day. I gathered all my charts and I walked right by Balch, went right around the corner and got my charts, wrapped them up and put them in my briefcase and stood out in the hall and waited for him to show up. He did all the bye-byes and good to see you and so forth. He and I headed down the hall, turned right to go to the elevator, and as we were going through the elevator doors he slapped me on the back and said, "You did a good job." And to the day he died that is all he ever said.

Dethloff: Ever said, is that right?

Estess: All he ever said. He never said, "I'm sorry I roughed you up." Just, "You did a good job." They subsequently, of course, made the decision to put the testing down here. However, I will take no credit for the presentation or study that was done. It may have been a political decision. I don't know on what basis the committee—the committee did recommend that the testing be done here. I believe it was the right decision. The numbers supported that decision. Huntsville wanted the testing done there very much. But after all, Senator Stennis cast a very long shadow in those days. There may have been that element in there. So therefore I don't take credit.

Dethloff: Yes.

Estess: I don't take credit for that study having—

Dethloff: You are very humble.

Estess: Well, I don't take credit.

Dethloff: Well, I understand in that kind of world. That's right.

Estess: As I look back—

Dethloff: You don't know.

Estess: I can see—I don't know.

Dethloff: And you will probably never know.

Estess: I don't know.

Dethloff: That's right.

Estess: So I don't know on what basis the decision was made.

Dethloff: That's a fascinating story. I like that.

Estess: After that was over, Balch formed a four-person team. Came back down here and formed a four-person team to help him really get going on the reconfiguration of this place. This was in '71. And the four-person team was John Ivy, Ken Daughtrey—help me, Mack.

Herring: Ken, you.

Estess: Myself and who was the fourth?
Herring: Y'all are the only three I remember, Roy.

Estess: There was four, but I don't remember the other one.

Dethloff: Daltry, D-A-W-T—

Estess: D-A-U-G-H-T-R-E-Y.

Herring: Bobby helped you all with that, Roy? I remember we referred to you all as the Three Musketeers.

Estess: Maybe it was three. I think for a short while we had four but we settled into three. I think you are right.

Herring: I think it was three.

Estess: I think we had the fourth early on then and we settled with three very quickly. Our job was to be Balch's executive staff on specifically turning this place into a multi-agency installation. And for whatever reason, maybe the shuttle thing or whatever, Balch used us all three practically equally. Except I was the one he called in the middle of the night, on Saturday or Sunday.

Dethloff: Privileged. (laughter)

Estess: He didn't call the other two guys. He would call me at two o'clock in the morning. Sunday morning. Saturday, any time. If he had an idea he would call. He also called Mack, but he would call me. He would bounce ideas off and he would want to hear what I had to say. Most of my job during those days was just trying to be honest with him. And listening to him.

Dethloff: Were you still on the testing activities?

Estess: No, he pulled me off of that. After that was over there was another guy here who was named Boyce Mix, who had been here through Apollo. And Boyce, in my view, was a better rocket engineer than I was. But he wasn't a salesman. He wasn't a people person. He wasn't a marketer.

Dethloff: Yes.

Estess: Balch asked this guy over, he had been working with me some, named Mix. And

after the sale was made (shuttle main engine testing) he called us both in and said, “Mix, I'm sending you to the test complex to implement what the Thompson Committee has decided and I'm going to keep Estess here. I'm taking him off the shuttle.” So I was on shuttle for about a year.

Dethloff: That was a big vote of confidence right there, whether he ever told you that or not.

Estess: Well, he kept me and sent Mix. Mix progressed up through the system where today Mix is the deputy project manager for the space shuttle main engine project in Huntsville. And I think in another few weeks he will be the project manager. Mix has risen all the way up to the top in propulsion. But he [Balch] sent Mix to the complex and he kept me here. And so then I became his “bag” boy. I traveled with him. I went on just about every trip that he went on. To the Hill, other agencies, et cetera.

Dethloff: Let me ask you something at this point too. In your own personal view, at what point, if ever, did you begin to become concerned that Stennis or that MTF may or may not endure? That its future was really in jeopardy. And did you share basically Balch's concern at this point?

Estess: Oh, I thought that we were dead.

Dethloff: OK.

Estess: I had watched—when I got here there were about—

Dethloff: I was going to say you came in about '65 or '66.

Estess: Sixty-six. There were about five thousand people here. We were still constructing when I got here. The B test complex was just a skeleton. Then I watched it go all the way into the test mode. We reduced to about eighteen hundred people, which was really the hard core operating team. I watched it go all the way down to about six hundred people after the last test. And I was in little study groups. I was in a study group that Balch put together, four- or five-person study group that dealt with the question, “If you close the doors how many people would you need to keep here just not to be criminal.” I mean keep the varmints out of the buildings, the grass mowed and the air conditioning on and so forth.

Dethloff: Yes.

Estess: The number was two hundred and thirty-five. That was the number we came up with. You close the doors and keep 235 people.

Dethloff: You know, I think I saw an instruction from Marshall or wherever saying that you need to give us this report on deactivation basically.

Estess: I was involved with that. I don't remember my role but Balch had me involved with that.

Dethloff: So you knew. (laughter)

Estess: I knew that we were in trouble. But I have to admit to you that I wasn't, I didn't have a sense of history. I mean, being around Balch was stressful.

Dethloff: Yes, everybody said that.

Estess: It was stressful on you as an individual. It was stressful on your family. But on the flip side of that was that almost everybody who worked as close as we did with him were amazed at his intellectual ability. I mean the guy had a photographic memory. Absolutely remembered every detail and everything that everybody told him. And so we were always amazed at his ability to recall details. We were also amazed—and I was a very young engineer and nowhere near ready to call myself a manger, but as I look back and recall Balch—we should be amazed at how inept he was as a manager. Particularly as a people manager. What Balch was was a strategic thinker, a tactician. We watched him set up dominoes, you know how you go set up dominoes. And those of us who have
simple minds set them up one right behind the other.

Dethloff: Sure.

Estess: Well, that's logical. The way engineers do. While Balch was a degreed engineer, he didn't think that way. As he was fighting the war to save this place, he set up dominoes all over the room, one at a time. And you look out there and say, "Why in the hell is he doing that. That domino makes no sense out there. It's not connected anywhere." And we'd go by for six or eight months and we'd see him set these things, and all of a sudden one day he'd push them over and every damn one of them would fall down.

Dethloff: They'd fall.

Estess: And all of our staff had watched them being set up and we never connected the lines.

Herring: That's a good analogy.

Estess: We never connected the lines. Balch had some characteristics. He would tell me, because I was close to him, 85 percent of what he knew. But no matter how close you got to him he would never tell you the remaining 15 percent. He would tell another colleague 85 percent; it wouldn't be the same 85 percent. So we used to get together and try to get to 90 or 95.

Dethloff: Try to find out.

Estess: We never could quite get it all, but we would get higher than what we knew individually.

Dethloff: That's something.

Estess: And he was able to keep all this straight in his mind. So when I was involved in it, I didn't have a sense that I was involved in the historical—I knew that the place was in trouble.

Dethloff: And here was something we could do to help.

Estess: And here was something we could do to help. I was trying to keep my family going. And also I was trying to please this man.

Dethloff: Yes.

Estess: If you ask me what was driving me in those days.

Dethloff: To keep your job.

Estess: It was keeping my job, but also I wanted, what was really driving me was to try to get a "Well-done" out of Balch. Which was difficult to do. During his career he did give me several well-dones, in his own way. I'm telling you, a pat on the back and one well-done is a gold star from Jack Balch. Boy, if you got that you were really something. I would be misleading you if I said I knew I was caught up in something—

Dethloff: Part of a crusade.

Estess: A crusade, yes, which turned out to be historical. Because the only person who really knew the whole picture—as I look back on it and have gotten higher up in the management chain and have gotten more experienced, I now can put it in perspective as I look back on it. But I couldn't see it when I was down in the organization—Balch could see it. There were only a very few people around that maybe had some glimpse of where he was going. Sometimes he described it to us. And on some days when everything was going good, we thought we saw the vision to create a multi-agency center in a cooperative spirit, sharing facilities, sharing resources, doing good for the country in fields for the environment. Save the earth. And some days we would say, "Yeah, yeah, yeah," and other days we would stroll out of this building at one o'clock in the morning saying, "This guy is crazy. That's crazy."

So as time went on during the mid-'70s, that was early '70s, we had successes. We got the Data Buoy program down here, the NOAA Data Buoy program. We got the Lower Mississippi River Flood Forecast Center. We were dealing with the Army, we were dealing with the Navy to get this big Navy contingent. Balch sent me to Washington incognito to attend the public hearings on moving the Naval Oceanographic office. And people were outraged at coming to Mississippi. I was a Mississippian. I went to Suitland, Maryland, to the high school, and watched people parade around with placards talking about the backwoods of Mississippi and "Don't put my Chevy on the levee." And people were standing up and irate, screaming about being sent to Mississippi. I was involved in those things. I was sent to Capitol Hill to work exercises with the Senator's office. I was sent back and forth to NASA headquarters and to Huntsville to brief people.

Dethloff: You were right in the middle.

Estess: I was right in the middle of his team to do this, yes.

Dethloff: What about now, while all of this was going on, relations between MTF and Marshall?

Estess: Very bad.

Dethloff: Yes, that's what I thought.

Estess: There were a few pretty good spots. The first was Rocko Petrone was one time the director of Marshall for a while. And you know from your history that he had been the director of, I guess, launch operations for Marshall down at the Cape. And Rocko was hard, and Rocko came down here a couple of times, and he didn't like Balch. And I was in the meeting where they really roughed Balch up. And Balch stood his ground. And I was sitting against the wall and I was in those meetings.

Another famous meeting was one night a NASA aircraft landed down here and Dale Meyers, Tom Paine, and Dick Cook, the deputy director of Marshall, we met. "We" being Henry Auter, who was Balch's deputy, and they carried me; I was the bag man. We got a room down at what used to be at that time the Ramada Inn at Waveland, Mississippi. And they worked Balch over that night about his dealings with the Congress. And I was in that meeting that night. They registered the NASA leadership at the motel under assumed names. None of them were registered at that motel under their own names.

Dethloff: Read him the riot act.

Estess: Read him the riot act for, in their view, it was somewhat justified. They viewed him as a non-team player. And that he was not supporting the agency. And it wasn't that they objected to people speaking their own minds; that was the culture of NASA. It was that they objected to him being so disruptive, which he was. And so some of NASA's view, both at Huntsville and at headquarters, was, as you look back on it, warranted. And I think Jerry [Hlass] will give you that too.

Dethloff: Yes, he did.

Estess: Give you that perspective.

Dethloff: How did he survive that? How did Balch survive at that time? Do you think because of Stennis? Do you think he really had a power base of his own and NASA wasn't going to dump him or something?

Estess: There were two or three instances. I guess I could tell you one story that was really educational for George Lowe. There were two or three instances in meetings and so forth where Stennis literally put his arm around Balch's shoulders and said, "This is my man." And also, go

back and look at what Stennis was doing in those days. Stennis took the floor and made a strong supporting plea for the space shuttle.

Dethloff: Yes. OK, Hlass mentioned that several times.

Estess: He single-handedly swung the Senate one year on space shuttles. And I have recalled in the last few weeks as we were trying to do the same thing on the space station that Stennis was that leader that stepped forward the previous decade on the space shuttle. And had stepped up to it.

Herring: Roy, you remember Fletcher was on that too.

Estess: And Fletcher was the administrator. And Dr. Fletcher always seemed to me to have a great respect for John Stennis. A very strong respect for John Stennis.

And in 1974, around January, Balch began low-level discussions, scheming, whatever, to think about separating this installation from Marshall. And he had convinced Stennis that the only way the place would ever survive would be to be taken away from Marshall, because Marshall was intent on killing it. Marshall's real intent it turned out was probably to get rid of Balch and not to kill the place. There was an enormous investment down here that the Marshall Space Flight Center had put in place. Marshall put this installation in place. And so I don't think their intent was ever to kill it. Although, when it came down to it, they would rather work there than here, of course. But the decision was supported by Senator Stennis that we ought to separate. And he talked to Dr. Fletcher, and Dr. Fletcher made the decision to establish this place as an independent installation reporting directly to headquarters.

Dethloff: I sense that that was rather abrupt. I've been going through Auter's files and all of a sudden it's here, you know.

Estess: Well, the discussions went on for two or three months. I recall being in earshot of the discussions. I recall that Senator Ellender's [D-LA] former AA [administrative assistant]—I guess Senator Ellender had died at just about that time—a guy named Jim Gerard, and a strong man for Stennis, a guy named Bill Spell, had been in repeated conversations with Balch about what it should be named. And there were several names kicked around. I can't attest exactly how the name came about, but all of a sudden the National Space Technology Laboratories emerged as the choice of names. And Dr. Fletcher, while I don't know what went on behind those discussions, did indeed issue a management instruction in the summer of '74—

Dethloff: I think I have a copy of that.

Estess: That said, “Here is the name [National Space Technology Laboratories], and it reports directly to headquarters. And in recognition of its different character now it will be our”—remember now, we haven't started testing shuttles yet; that was in '74. But, “it will be our test place for shuttle main engines and main propulsion system, and it's a multi-agency federal laboratory and therefore it should report directly to headquarters.”

During that early '70 time frame also was the famous ten million dollars that we were all involved with. We mobilized to spend that money.

Dethloff: Sure.

Estess: We invested that money in facilities that are still national assets today. And so in '74 they renamed this place. They were getting ready for the shuttle start and I was sort of looking for—here they were about to start running rocket engines again and I was not involved. Balch had taken me off. I had no real hope of getting back involved in the early days of the shuttle. Balch wanted me to do something else. So just about the time the place was named the National Space Technology Laboratories, Balch looked around and said, "I don't have anything. The shuttle is coming out there; that's Marshall's. The other agencies are coming in here and they've got their own programs. I'm in charge of the roads and the buildings and I don't have anything. I don't have a program. Bob Piland is downstairs with the Earth Resources Laboratory. I don't have anything to contribute except managing this institution." And the politics was coming along and so he said, "Henry Auter, go get our own technology development thing going. Go do something. Gather up a bunch of our good guys and see if we can't get a research effort going that will bring us some credibility in this multi-agency community so that we can at least sit at the table with these guys. Otherwise we are just going to be in charge of the roads and grounds. We don't have anything to do with the shuttle except facilities." So Henry gathered, and Balch suggested who he might get together, and I was one of those. There were about seven, eight, nine, ten people. Balch said, "By the way, I've got a little money." And so Balch gave Henry some money and we hired the contractor, General Electric, to put together some real brains to help us develop a technical role. Very soon after we got started—

(The interview continues on tape one, side two)

Estess: When Henry [Auter] was gone over about three days, Balch came to the conclusion that he couldn't live without Henry so he would go find him and bring him back. That cycle was repeated year after year after year. Henry would tell him things that he didn't want to hear by telling him the truth. And Balch in his own way would fire us all, give us another job. In the case of Henry, always after a few days he would go get Henry and bring him back.

Well, it was the same again; history repeated itself again. He set up this technology development effort or told Henry to go set it up. Henry soon was pulled back and I was left to—I was sort of Henry's deputy although I didn't have a title. So Henry went away and I was sort of by default left in charge. We were propulsion people; we didn't know anything about the NASA research programs. We found out that you had to write something called a RTOP [Research and Technology Operating Plan] to get money for a research project. And Balch said, "Aw, kids, youngsters don't know anything, don't know how"—so he called up one of his friends who was manager of Michoud, George Constance. George had been the manager of Michoud Assembly Facility. He said, "George, come over here, spend a few weeks with us and help my boys." So George came over and he was an experienced manager, Balch's age. So George was our acting chief. I can remember us getting the first RTOP forms that were ever brought to this place. George sat down with us and we literally read the instructions on the back of them and we started conceptualizing some R&D efforts that we might do down here that made sense in view of this

multi-agency community. We started at that time going to headquarters then and began to look for sponsors. So we had—

Dethloff: You were going back to headquarters?

Estess: Going back to headquarters.

Dethloff: What kind of reception were you getting?

Estess: No reception. And we were doing some good things. We were doing good things with money that Balch was stealing—stealing is wrong—that Balch was appropriating out of the operational base. We did some great work. Some of it went on to underpin other major work at NASA. Like the applications of satellites for
emergency communications. The whole business of using satellites to tie ambulances, fire trucks, emergency vehicles together, that was first done here. First experiments with that was done here using the old ACT satellite. And how did we do it? Our contractor was General Electric. General Electric had the antenna development capability up at Schenectady, New York. And we rode in on their technical backs, we rode in on the backs of G.E. So G.E. was really our technical base. So we got several good projects—applications using satellites—going because we had a contractor named the General Electric Company in here to help us. So after we had a few successes, NASA began to say, "Well, maybe those guys can get us a few dollars."

Well, in those days Balch was—this was mid-'70s, the year I guess before Jerry came. He came in '76, right?

Dethloff: Yes, September of '76.

Estess: In '74, this place was renamed, we had agencies coming in, and Senator Stennis and Senator Stennis' staff lost their will for daily battles. The Army had announced that they were going to build a plant; the Navy had decided to move its operations down here. The space shuttle was coming in, the population had gone from 600 up to about 1,175. The curve was on the way up and the view looked bright. The politicos and the staffers put their arms around Balch and said, "Hey, Jack, we won. The war is over. The war is over, Jack. The place is going to be all right." Well, it turned out that Balch, all along, what he had enjoyed was the war. While he was on a crusade to save the place, what was really driving him was the thrill of the war, in my opinion. And so Balch sort of lost his zest for the war. He decided that we ought to save the world and build an international center of
excellence, to attack the environment and save the oceans of the world and so forth.

"We haven't won. We have an opportunity here to build an international environmental center and I'm tired." And he [Balch] left.

Dethloff: And that was it. I really wanted to ask that question. You really think that was it. That's interesting. Because I looked at that file and it just, you know, here's the announcement and there is no explanation. Then Mr. Auter gets left with the operation.

Estess: He left. And Henry was left as acting director.

Dethloff: Yes, without any designation or appointment.

Estess: He was acting [director] for a year though.

Dethloff: Yes.

Estess: And the reason they never named him—Henry Auter was a competent manager, he was well-based technically, had good credentials out of the test laboratory at Huntsville. The reason he was never named was because he was an unknown quantity in headquarters because he rarely ever traveled; he didn't like to travel. He wouldn't fly. And he was an unknown quantity and Balch cast such a long shadow that they, I don't think they ever considered that. The other thing was that I think they wanted to send somebody down here that was not of the culture, to get this place under control.

Dethloff: Under control, I sensed that too. I didn't tell the last time that we were talking about that, after his talk that that was probably one of his mandates in a way, to bring—well, you used the term—re-NASAfication.

Estess: Yes. They wanted to get it under control. NASA had gone through a headquarters organization, a guy named Todd Groo had come up. This place reported to Todd Groo. He was an associate administrator for management. And he had the responsibility for NASA to name Balch's successor. Jerry [Hlass] doesn't know all the phone calls, but there were several names on the list. There were other names on the list that I'm aware of. One of the people who was asked for a name was Bob Piland, he was asked by Todd Groo what he thought about this place. When all was said and done—Jerry was very well thought of at headquarters and had done a good job on the shuttle facilities. He was also very tired; he had worked himself to death. Groo asked Jerry to take this job. Jerry came down in '76. I was still running the engineering organization that Balch and Henry Auter had set up.

Dethloff: For new applications and so on?

Estess: That's right. I was chief of applications engineering.

Dethloff: Yes, I have that.

Estess: When Jerry got here, he looked around this organization and for some reason Jerry started talking to me. I had met Jerry in the Apollo program. He used to be the key headquarters facilities person. I met Jerry on a test stand. I used to talk to him on the test stand; I got to know him a little bit. He came down here repeatedly during Apollo.

Dethloff: Oh, that's why he talked to you, he is really a test person. All during the interview we kept talking test, test, test. That's what it's all about.

Estess: So he had the background.

Dethloff: And he knew that.

Estess: And I had known him from those days. And I learned early on Jerry didn't consider Jack Balch a folk hero like we did down here. He came down here with a specific mission, to "get the place under control, make the agencies pay their own way, do a good job of supporting the shuttle, and be a good solid member of the community down there, raise the NASA flag high," and Jerry bleeds NASA blue.

Dethloff: Yes. (laughter)

Estess: And he took that charge very seriously. One of the first things he set out to do as he looked around—he had less than a hundred people assigned to him. He saw that he had no mission other than to run the base. So he went back to Todd Groo and after some months—I was not involved at that time with him at that level. I was running this application engineering and he was reviewing and seeing what we were doing. While it was noteworthy, modest by headquarters terms, he thought we were doing a good job, but it was too small. He wanted more. So early on he decided that the first thing he ought to do was get the Earth Resources Laboratory changed from Houston to here. So he went back to headquarters and talked to Todd Groo. Groo said, "Hey, Jerry, I don't know anything about that. If that makes sense, fine. Chris Kraft doesn't think that's a big deal, it suits me." Well, I don't know how he did it, but nevertheless before we knew it he had succeeded in getting the laboratory administratively transferred. Now he had a program.

Dethloff: Yes. He said that he just called Kraft and talked to Kraft—I don't know if you ever talked to him, but that was at lunch today that we talked about it. He said that Kraft was really tremendously helpful. That he had said yes, in effect, "Take it." That in all the years after Kraft would come by in his airplane and pick him up and take him to meetings, and he and Kraft really became very close.

Estess: I think Kraft thought that it didn't ever make sense for it to be over here reporting to JSC.

Dethloff: Apparently not.

Estess: So Jerry just—

Dethloff: Just asked.

Estess: Just asked and got it.

Dethloff: That's the way he put it, you know. And he really admired Kraft, I guess, because of that.

Estess: Chris Kraft was always a straight-shooter. He did first what made sense to him. Well, Kraft agreed to that; they transferred. Now Jerry had a program. About that same time NASA

was instituting a big new initiative to try to push Landsat technology out into the states. That laboratory located here at the National Space Technology Laboratories was given one-third of the United States, seventeen states actually, to be responsible for, to transfer Landsat technology. They established something called a Regional Applications Program. Jerry integrated the applications engineering into the Earth Resources Laboratory, which was now headed by Wayne Mooneyhan. So Jerry and Wayne agreed that I would be a division chief within the laboratory and be responsible for this program. I was promoted by Jerry to a division chief in the Earth Resources Laboratory to run the applications program.

Dethloff: And relating heavily to Landsat Regional Applications Program.

Estess: Yes. That must have been about '77. That was in '77 that that happened. So I've stayed in that for three years. In 1980 I worked very close with Jerry. He was very interested in the Landsat program, the remote sensing program. He thought it had a lot of merit on its own. He was very particularly interested in the part of it that I had. So while I wasn't the director of the laboratory, Jerry spent a lot of time with me. He'd call me in, he wanted to know what was going on. So he and I spent a lot of time together on that program. When visitors would come in, I'd be one of the ones he would trot out.

Dethloff: Yes. Show what you were doing.

Estess: Dog and pony show. So when there would be a VIP come in, Jerry would get an agenda together, he'd trot me out and I'd do my thing. So in 1980, in the summer, Henry Auter decided that he was going to retire as Jerry's deputy. Late summer, I guess it was August, late July, Jerry put out an announcement for what was an SES position as his deputy. I was once removed; I was a division chief. I was not reporting directly to him. Somehow I wondered if that might be a career opportunity. I had never really thought about being Deputy Director at the National Space Technology Laboratories. But nevertheless here was a job opening and there didn't seem to be any heir apparent, because we thought that the strongest person on the place was Mooneyhan. But Jerry and Mooneyhan weren't compatible as manager and deputy. That would never work. As we looked around the rest of the organization there did not seem to be an heir apparent. It seemed to be a wide open competition. So when you see wide open competition everybody, of course, sits up and takes notice. It didn't seemed to be wired.

Dethloff: It's so rare. (laughter)

Estess: It didn't seemed to be wired. Jerry seemed to be—

Dethloff: Genuinely interested in searching for it.

Estess: Yes. He wanted to see what was the best deal he could get. I didn't want to be so brazen as to say, “Golly, I want to jump one step in management and become Jerry's deputy.” They may laugh at me, for goodness sakes. So I made myself an appointment, and I went down to the Rouchon House and I said, “Jerry, I'm here to talk about this announcement.” He said, “Well, what do you want to know?” I said, “Well, there is an awful lot of work that goes into this

thing. We're mighty busy. I just want to know if I'm a fool for even going through that paperwork." Jerry was so official. I looked for a little bit of encouragement or—

Dethloff: Just anything.

Estess: Or discouragement. If he had said, "Well, Roy, you're sort of"—

Dethloff: You're young.

Estess: "You are a great guy, you're young"—you know, anything. But he was so sterile.

Dethloff: You didn't know where you were at. (laughter)

Estess: Yes. I mean he just basically said—

Dethloff: He played a little poker there.

Estess: He said, "This thing is out there. You make the decision. If you put your name in you will be considered." I mean nothing. So I walked out of the meeting without knowing. I contemplated several days and I decided that there are only a few crossroads in one's life.

Dethloff: (laughing) What the heck.

Estess: What the heck. So Jerry went through his process and when I got to the interview, again, it was so mechanical. He had built himself a matrix of questions. He put everybody through it. He put me through it. I was working very close with him here, but he put me through every one of those questions. He followed the procedure, which was impressive. Through his process, whatever it was, I was selected. And I learned later who was on that list. I was in awe that Jerry selected me.

Then I spent eight years as his deputy. I learned a hell of a lot from Jerry. What he really taught me was how NASA thinks. I had been taught by Balch about planning and how to get things done. A lot of things not to do, Balch taught me. But for seven or eight years Jerry taught me about NASA.

(brief interruption)

Estess: So I worked very closely with Jerry. We had our disagreements over the way to do things from time to time. But I always supported him as being the director. I enjoyed my relationship with Jerry.

Dethloff: How would you compare he and Balch? You have already, in a way.

Estess: A couple of things they had in common. They didn't have a lot in common. But first of all, Jerry also is very, very smart. He's a very smart guy. The other characteristic he had with

Balch is Jerry is very results-oriented. Jerry would rather accomplish something than to please somebody. So while he wants to be congenial with the community, his first objective was to get the mission of the organization accomplished. If that meant that somebody was not happy along the way, so be it. So Jack and Jerry shared a commitment to getting something done. In the case of Jerry it's getting done what the agency wanted.

Dethloff: Yes, I sensed that.

Estess: That's not to say that Jerry always agreed with the agency, and there are notable examples where he violently disagreed, the ASRM decision being one. But for the most part the biggest difference was that Jerry was a NASA soldier and Balch was a renegade. Jerry Hlass came down here and he was committed to do NASA's business.

Dethloff: Yes, I think so.

Estess: He was committed to the idea that the only way that this place could have a stable future was to bring it back into the NASA family.

Dethloff: Yes, absolutely. He said that almost exactly, without being explicit.

Estess: So he didn't enjoy being a part of funny stories about Balch taking on NASA. He didn't think that was funny.

Dethloff: Yes.

Estess: He didn't want us to hold that up as a standard for his period. He wanted us to be a part of the NASA family. So he drove us very hard back to being a part of the agency.

Dethloff: Did you have any trouble doing that? Since you had come out of that other mode and now you are moving into a different mode.

Estess: There were some of us, me included, that from time to time—and Jerry and I had some harsh words over it two or three times. He gave me lectures from time to time about how the agency always made the right decision to do the right thing for the right reasons. I said many times to him, “Don't tell me that. I've been on the other end.”

Dethloff: See, I can understand both sides, too, because JSC has squared away with agency headquarters many times. I'm familiar with that story. So I can understand Balch.

Estess: We had some terse discussions. Jerry knew that I was left with a distrust of Huntsville and with NASA.

Dethloff: You bet. I understand that. That's the way it was with JSC.

Estess: There were several of us senior people here that shared that. So Jerry had himself a major job. He had to turn us all around and get us working on a team for NASA. His biggest

problem was that we were a bunch of junior renegades that had been trained that you couldn't trust NASA, and particularly the Marshall Space Flight Center. That's the way we were trained. Jerry set about to change that. Boy, you have to give it to him, he did a pretty damn good job of it. It's changed now; it's about 95 percent, there is only 5 percent of that doubt left in some of us old-timers. Not so much me, but I don't know whether Jerry brought it to us, but then Challenger came along. Jerry had turned us around pretty much, but then after Challenger, Dick Truly came on the scene. Dick Truly then became Jerry's boss. Truly, a Mississippian, loved propulsion and airplanes and so forth. And Dick started coming down here and bringing the management council about every two or three months. Truly started bringing all the shuttle team to Stennis. And so with the climate that Dick Truly created, he and Jerry pushed this place totally into the NASA camp.

Dethloff: That's a nice story. That's good.

Estess: So the final icing on the cake, in my view, was when Truly came back—Truly had a major problem. He had a disjointed shuttle team that had come apart because of the accident. He had lost a center director at Kennedy, the center director at Marshall, Lucas was gone. Jerry Griffin was gone from JSC. Truly had to assemble a brand new team. The only one that was kept was Jerry [Hlass]. So Truly assembled this new team and he then started treating us all equally. He brought what was to become the Stennis Space Center up to the table and he said, “Don't sit against the wall. Be a full-fledged member of this team.” So he created the management council, and he gave Jerry Hlass a seat at the council. So Truly is the one who finally, in my view—and Jerry was more than willing to be sucked into that—Truly then finally brought us back into the full fold of NASA as a full-fledged member. Now we sit side by side with Aaron and Forrest and Jack Lee. While we don't have the role that JSC does, we are treated very courteously and with respect, and we feel a part of the team. That's the remnants of Truly's gift to this center.

Near the end of Jerry's term in '88, of course, I got a call one day. This is historically significant. I got a call, the first call—you check this with Jerry, but I don't believe that anybody had mentioned to Jerry the potential of renaming this place in 1988, early on. And one day I got a call—because I had come to know a guy in headquarters—I got a call from a guy named Holly Cantus, who was a political appointee out of the White House and was the associate administrator for external relations.

Dethloff: External relations?

Estess: External relations. And Holly told me, “I've got a little action out here for you. This is a top secret action. I want you to do something for me.” I said, “What?” He said, “I want you to write me about a two- to three-page white paper”—God, I wish I had it now; it's in these files somewhere—“on what Senator Stennis has done for NASA and why we should name the National Space Technology Laboratories after him. Write me a short one.” If I recall, Mack, I got you involved in that, do you remember that?

Herring: Yes, that's why I remember the paper.

Estess: And you and I started searching congressional records and files. You talked to Henry, I think, and we wrote overnight two or three pages of—we literally wrote it overnight because the next day Cantus and Fletcher were going to the White House. I went straight away and told Jerry, and of course, Jerry was very pleased at that possibility. If I remember right and we'll have to ask Jerry, I believe I got the call from Cantus. Jerry was either out or it was because Cantus knew me.

Herring: I know that I dealt only with you on that.

Estess: That's right.

Herring: And I remember that Jerry was not involved.

Estess: Jerry was not involved early on.

Herring: Or anybody else.

Estess: And we wrote the white paper and I gave it to Cantus. It was pretty ragged, pretty ragged. We faxed it the next morning to Cantus. He got it and I said, "Y'all need to work on it." He said, "We haven't got time." He took the white paper, and he and Fletcher were on their way to the White House for some other meeting. While at the White House they stuck that piece of paper, and I don't know what the circumstances were, whether they had been asked for it or whether or not they were promoting it. I don't know, but Dr. Fletcher was fully supportive, the way it was related to me by Cantus—and Cantus is still around and it would be good to ask him. He works for Lockheed now. The way it was related to me, Dr. Fletcher wanted to do that, as I understand.

Dethloff: It makes good sense.

Estess: They stuck that under the White House's nose, some staffer over there, to see what the reaction would be. They had decided already to name an aircraft carrier after the Senator. That was a national thing. So they just took this rough piece of paper which had the idea on it and sent it over there. In the meantime they came back and we started really polishing the paper. And second of all they said, "Come up with some alternative names." Remember that night?

Herring: Yes.

Estess: We listed several. And the one that we really preferred, because we were so steeped in the multi-agency arrangement, was the Stennis Space and Ocean Center.

Herring: They said to take it out.

Estess: We called up and we had a list of four names. I don't know what the other two were. That was two of them. We had the Stennis Space Center, of course. And Cantus said, "To hell with the oceans. This is a NASA place. We are going to name it the Stennis Space Center." And Fletcher said, "You're right." Whereupon that became the name officially. Later, however,

the Navy, through the Pentagon, objected to that name and petitioned that the word *ocean* be put in it. NASA pocket-vetoed that or stonewalled it or something. President Reagan and the Congress, Trent Lott—

Herring: Thad Cochran was a good champion of it too.

Estess: Thad Cochran championed—

Herring: Thad Cochran was the one.

Estess: Yes, it wasn't Trent Lott, there was no race. It wasn't Trent Lott. Thad Cochran took up the cause on the Hill. A Republican senator and the White House were supporting it. The executive order came out and history was made again. They changed the name again; for the second time Jim Fletcher had changed the name of the same place.

Dethloff: Oh, is that right?

Estess: Yes. See, he changed it to the National Space Technology Lab in his first term at NASA.

Dethloff: That's right.

Estess: He changed it again when he was back in after Challenger. He is the only person to be an administrator twice. He is the only guy to change the name of one of the centers twice.

Herring: That's right. I had never thought about that.

Estess: He and I talked about that when he was down here for the dedication. Later when he approved my being named Director he wrote me a note, which was nice. But then at the next meeting when he called me in for my first meeting as the Director with the Administrator, we were chatting, and he always identified me with that event. He said, "You know, you were the guy that told me that I—it had never occurred to me that I was a two-time Administrator that changed the name twice." So he identified me with that action.

And Fletcher, the times I was around him and Dale Myers—by the way, Dale had changed his whole stripes. Dale was back in now as deputy administrator, and Dale was part of that, "God, this guy Balch"—and when Dale Myers was back now as Fletcher's deputy I talked to Myers. I was the Director and I talked to Myers about Balch. He laughed about it and he said, "Jack was an interesting guy." He didn't display any—

Dethloff: Didn't display any—

Estess: Didn't display any displeasure. But I was in a meeting one night in a Ramada Inn when Dale Myers was there and he was upset. But after Challenger, Dale was more philosophical. And I was on a different level and he talked about how Balch was a pusher and an interesting fellow. He never had a negative comment to make.

So Fletcher changed the name of the center. I mean the President did with Fletcher's full support. There wasn't a 100 percent support for that idea. Everybody in NASA didn't support it. First of all the name Space Center, the name Center stuck in a lot of people's craw. Because it's a new status and it was reported that way in the newspapers. It was an installation before and now all of a sudden it's a “center.”

Dethloff: Yes, co-equals.

Estess: What didn't come with it was a whole hell of a lot of extra money.

Dethloff: Budgeting, yes.

Estess: It was just a name.

Dethloff: Just a name, yes.

Estess: But at the same time it got a name, Truly was soon to move up to administrator. So that has been a fortuitous situation. Not only did Truly move up to administrator, his deputy, J. R. Thompson, believes, his passion is that you need to test, test, test.

Dethloff: Yes.

Estess: So J. R. believes this is a real asset to the agency. He's been very supportive of us down here. He's a tough taskmaster, but he's still very supportive of us.

So the last thing that I remember—you asked me about the events then that led up to the dedication—is we did know that it was historical. And that it had to be done just first-class. NASA headquarters said, “Tell us what it's going to take, be reasonable.” They sent us—

Dethloff: They were 100 percent behind you, yes.

Estess: And cooperated 100 percent. They sent us the money. They sent us the money to put on the dedication, to build the gates, you know, the signs at the gates. To build the main arcade out here in the front. To change our stationary. They sent us the extra money required to change the name without reservation. So we put together a massive effort.

Dethloff: Yes, Mack has that on tape.

Estess: Mack almost cratered on that, I mean that was—

Herring: (laughter) It was fun.

Estess: It was a grueling preparation.

Dethloff: Yes, he is going to give me that tape. I'm anxious to see it.

Estess: Then finally we had that dedication. You'll identify with it. Of course, we had Cochran who had been the champion of it, a bunch of astronauts; the lead, of course, was Admiral Truly.

Herring: That would be a good illustration, Henry, on the book because a couple of the major pictures out of there would be [good] illustrations.

Estess: Yes, we had the Air Force to fly over, their F-16s, that day and so forth.

Dethloff: Yes, I'll bet.

Estess: It was a good day. Hot.

Dethloff: Hlass was very proud of that day too; it was a great finale for his career.

Herring: One of the marks that I thought, and that we all talked about all the time we were planning it, was what Stennis enjoyed the day. And he did.

Estess: I don't know, Jerry may have, I don't know who decided for me to be the master of ceremonies. I have a squeaky, high-pitched voice with a southern accent. We have professional commentators in NASA, Kukowski is one, who could have been the master of ceremonies and done a much more professional job. But I don't know, I guess it was Jerry who decided that I should be the master of ceremonies that day. That's one of the times in the history of this place that highlights in my memory, too, the opportunity to do that. As I look back over the things, you now, it rates right up there with the first S-II test.

Dethloff: That's good, yes.

Estess: The first time we fired a second stage thrilled us for a long time. Then when we landed on the moon; that was absolutely the high point. But right up there among the top was the Stennis dedication day and five or six thousand people sitting out there and having the opportunity to be a part of that. I introduced the Governor, and Fletcher and I got a little schooling from Jim Kukowski, who is now retired. He was our professional pitch man. Kukowski came down to help us.

Herring: One thing, Roy, that was humorous about that. You remember whenever Kukowski helped Jerry a little bit, too, and he told Jerry to point to something.

Estess: He wrote it in his speech.

Herring: He wrote it in his speech to make the gesture.

Estess: He wrote it in his speech, he had Jerry's speech. Jerry is a—now, we always told him, we aren't talking behind his back. Let him hear the tape; Jerry don't use the notes. When he would just go talk he was outstanding. But he would be scared that he would miss a point, so he would wind up reading it. He was reading his speech that day and he came down to the break and it said, “Point to the tent.” And he said, “So and so and so.” It was a twenty-second pause

between it [and his pointing at the tent] and everybody just starting—(laughter). We've all laughed—

Dethloff: At what point did you know Hlass was leaving? Had he already sort of indicated that he was going to—

Estess: No, Jerry was very careful about that but he had told me off and on for about a year that he was "considering" it.

Dethloff: You weren't anticipating anything imminent at that time.

Estess: No, not specifically. I'll tell you how it came up. I guess he left that year, didn't he?

Dethloff: Yes, he left in '89.

Estess: That's right, he left in '89.

Dethloff: He left in January of '90.

Herring: No, wait, that was in the summer of '88, he left in January.

Estess: He left in January of '89 and I took over. Actually he left in November or December of that year.

Herring: Probably, yes.

Estess: In December. But I'll tell you what happened after the Stennis dedication. During those days Jerry had a couple of things going. One was that his back was killing him. He was having chronic back troubles and he didn't feel good. His kids were growing up and getting to be rambunctious youngsters, and I don't think his wife was pleased. He didn't think she was pleased with living on the Coast. And so they had always dreamed of going back to what they considered home, which was Virginia. So he was saying to me, "Roy, maybe it's time for me to go." I never once put the pressure on him, you know, I said, "Jerry," because I had no idea that I would ever be considered for it [Director's job]. The only time I ever really applied for a job was when I applied for the deputy and I got that. So I wasn't coveting his job. The fact of the matter is I just enjoyed working with Jerry. But from time to time when he would get tired and we were having a private conversation, all that summer he would say to me, "Maybe I need to carry my family back up there." I
told him and he will tell you now, "Jerry, it's a mistake."

Dethloff: Oh, he told me that. He said, "We moved, we bought, and we came back. My kids were miserable, my wife was miserable, and I was miserable." And he looked happy today.

Estess: If you will ask him, he will tell you that I told him repeatedly that it was a mistake. I said, "Jerry, your children are Mississippians. This is a better place to live than the suburbs of Washington, this is a better place to be." His wife didn't believe that, and, "You've got a place

to fish." So he said, "I think I'll go back up there." And so in November he came in and he told me, "I'm going to talk to Truly about it." We were in D.C. at a management council meeting and Jerry went in to talk to Truly. Truly said, "Hey, Jerry, you've got a long, distinguished career but if that's what you want to do, you've got my blessings." You know Truly was a real good leader, and soon he told Fletcher that Jerry was thinking about hanging it up. Well, before you know it Fletcher calls up Jerry. He had great respect for Jerry and he said, "Hey, Jerry, I've got real
problems up on the Hill. Rather than retiring why don't you come up here and help me on my staff. Work directly for me." So Jerry got a little spark in his eye; it was a new challenge. So he left his family in January and went to Washington. Left his family to finish out the school year. On January the 23rd or something they named me Director and Jerry went to Washington to work for them.

Now the way I got this job [Director] was very unceremonial. I was acting—no, I wasn't even acting, Jerry had just announced that he was leaving. About three weeks or four weeks after they announced that, there was no announcement about the job or anything. One day I got a call from Dick Truly who said, "Come see me." In the meantime I had had a conversation with Noel Honners who was the Associate Deputy Administrator. He is the only one who ever talked to me as a candidate for the job. His view was—and he told me straight up where he came from—that I had a major defect in my background in that I had never done a tour in Washington.

Dethloff: Yes, that would be a—

Estess: And Noel told me that, and I appreciated him being candid with me. We were at a management meeting out in West Virginia, Shepherdstown, West Virginia. We were at a senior manager's council and I was sitting at the table with Noel one night. That was after Jerry's announcement, before anybody was named, and Noel told me that he would consider this a weakness on my part. I was never called in by Truly or anybody else and said, "Hey, here's the job and here's what we expect from you." I was called in by Admiral Truly and said, "We've looked at half a dozen names on the list, pros and cons of everybody. I've decided that you are the right person for the job." He didn't ask me, "Do you want the job?" Or, "Would you be willing to take it?" The Admiral had given me the job and I said, "Yes sir, I'll do the best I can." That was very unceremonial; it lasted just a few minutes. We went on talking about business.

Dethloff: Isn't that something. You know, I've really puzzled over how all these appointments are made out at JSC and all, and I don't think they know. I just don't think there is really any kind of real—

Estess: I think what happened here is they had a half a dozen that they had asked, "Who are the candidates?" And they probably had several deputy center directors around that they were thinking about. He told me that there were half a dozen candidates. He also told me that not everybody agreed with his selection. I knew right away that one of them was probably Noel Honners. That was fine. Noel had the feeling that somebody—of course, Noel had been forthright enough to tell me to my face.

Dethloff: Right.

Estess: So I'm sure that Fletcher, Myers, Noel Honners and Dick Truly got together and decided. I think they did it, those guys. Immediately I got a call from Fletcher, immediately. He said, "I understand that Dick has talked to you, and I want to tell you that I fully support that selection. I'm glad that you have accepted this, and I know that you've been down there a long time and you know the place better than anybody else. You are prepared and we look forward to working with you." That was it. It was sort of, "Get at it, boy." (laughter) That's all you get. So that's the story—

(The interview continues on tape two, side one)

Estess: The scene down here was quickly changing; that had started under Jerry's leadership, but it was just starting. We were converting Stennis Space Center from a single rocket propulsion program place, the space shuttle main engine, to a multi-program place. But it was just getting started. There were no facilities under construction. Jerry in the last days of his leadership here cut the first tree for the component test facility. There was a tree-cutting ceremony early on so that Jerry could participate. Construction didn't start for some time because there was no design. But Jerry did cut the first tree, but there was no design for either one of those facilities. But Jerry wanted to be a part of it, and they wanted Jerry. It was right that he should be a part of that. He was part of the ground-breaking, except it was a "tree-cutting." They cut the first tree out there for the component test facility. And so we were just getting started.

I came in with the mission from Admiral Truly, who later became administrator, to continue to get the Stennis Space Center more involved in the mainstream of the shuttle and propulsion. While he didn't have those discussions with me early on, he and I had several discussions over time when he was my boss as AA and then later as administrator. A lot of them occurred when I was in the process of finding my deputy. Because he was personally involved with that process, as he continues to be today. He reserves the right to be involved with the selection of deputy center directors as well as center directors. If I resign today, Dr. Lenore would have to council with Admiral Truly before he named my successor. So the administrator reserves the right to—

Dethloff: To veto the selection.

Estess: To be involved in the selection of these senior leaders. And so in those discussions were where Truly and I had the most exchange about where we ought to take this place. Now, additionally when he named J. R. Thompson as his deputy—I've had numerous discussions, private discussions with J. R. about my mission here. As now I've had, of course, [as boss] with Dr. Lenore.

Very early on I knew that I had a mission to carry the SSC to another plateau beyond what Jerry had carried it. Because the circumstances now were right. My principal mission early on was to prepare this place for the future. A multi-program propulsion test facility. To improve the staffing, upgrade the facilities, and to raise our level of participation in the shuttle program. Consequently I selected a deputy who was a part of the shuttle community, and today we are members of the Flight Community; we participate in all the launches. So we have ratcheted our

participation up in the shuttle program beyond what Jerry—and I consider that my mandate. I haven't gotten all that done yet. I'm still in pursuit of what I think my charge is from the agency.

Dethloff: Sure. This is a tough time in one sense—money. It always is, I guess. Are you getting the kind of support that is helping you?

Estess: Well, I can answer it. NASA has been very supportive, very supportive of us. They've given me additional civil servants. They've given me additional money to repair our facilities. The last two years they have given me money to buy equipment. They've recognized the difficulty that we are having with the small staff in building these new facilities. Within the limits of what they could do for us, I don't have any complaints. The fact of the matter is, my—

Dethloff: So you are not an ugly duckling any more at all?

Estess: No. My biggest frustration, quite frankly, is not that they haven't supported me; it's that given that they do believe in what we are doing, they themselves had limits on them. If the agency had been in flush times, with plenty of money—

Dethloff: You'd have really gone on.

Estess: I would have made out.

Dethloff: Maybe that day will come yet. (laughter)

Estess: Well, you see, I'm afraid that the moons will move out of alignment before they get any money.

Dethloff: I hope they come back into alignment.

Estess: As I say, we got full support from them. I've been to JSC and asked Aaron for help. We are a small place. He recently granted us access to his computers there to handle some of our administrative work. Our colleagues at other centers have been—I don't recall a time when we've had a better working relationship with other centers.

Dethloff: That's good, that's important. How about with Marshall?

Estess: We are working very well. We always watch one another!

Dethloff: Oh, yes. You better, right?

Estess: But I'll tell you, J. R. Thompson after Challenger really changed the Marshall Space Flight Center. Jack Lee, his deputy, carried on that tradition. Today we work very well with Marshall. Marshall and JSC have big jobs. Big jobs.

Dethloff: Yes. Well, do you see now the other agency dimension here continuing to expand or develop at all?

Estess: I see it fairly stable for a number of years. The fact of the matter is the Army plant is closing, you know that.

Dethloff: Yes.

Estess: The Navy has impressive capability here, but unless the budget climate changes we won't see very much growth.

Dethloff: Do you get very much interaction among these agencies here through a management council?

Estess: Yes, we have a management council. Jerry established that. But I've taken it a step further. The management council was too big and unwieldy with eighteen or nineteen people. I established an executive committee of the management council, which is chaired by me by a mutual agreement. Membership by Admiral Koehr, the Commander of the Naval Oceanography Command, the commander of the Army plant and the senior person from NOAA. The four of us, you might say, the big four, get together periodically and we sort of set the agenda for the agencies. We have maybe three meetings of that a year, then about two meetings of everybody else a year. Then we have something called the Mississippi Coast Association for Federal Administrators, which is where the heads of all the agencies of the Coast get together. That is about three or four times a year. So we do have an inter-agency mechanism for talking to one another.

Dethloff: Do you feel like because those institutions are here that somehow there is an enrichment of each other in terms of mission and accomplishments?

Estess: Absolutely.

Dethloff: There should be.

Estess: Absolutely. Balch is the first one that taught us the word, synergistic, synergy. We never knew that word. Balch always told us that there were going to be some synergistic effect of these agencies working together. His prophesies turned out to be true. We not only share the cost of operating the center, but we have numerous examples of cooperative projects where we both benefit from the joint research. Being located in the same place, regardless of what we managers say and how much bureaucracy we want to put in the way, in terms of memorandum of understanding and agreeing to cost and so forth, while we are up here in the conference room on the third floor talking to managers, our people, our computer scientists and our engineers and our technicians are in the cafeteria talking to one another. They are communicating and laughing at us managers up on top trying to agree. In the meantime they are exchanging ideas and they are even shipping software to one another, God forbid. I've caught them loaning each other parts for computers and everything. We haven't blessed all this, but it's great, it's great. So we just stay out of the way, and we've got Department of Commerce people talking to NASA people and talking to Navy people and sharing common ideas and cross-fertilization. You know who makes out? The taxpayer.

Dethloff: Everybody, that's right.

Estess: The taxpayer makes out. It's a great environment. And as long as the managers don't screw it up, it works better.

Dethloff: Have you seen any special or unique dimension here by the nature of those agencies? In other words is this an environmental association of some sort, earth resources association? Is this some device now that is unique in NASA, in that maybe man can transfuse space research and analysis to earth?

Estess: Our common bond in this multi-agency arrangement here is the application of space technology to managing earth resources.

Dethloff: OK. You know that was in that mission—whatever it was, mission statement—that was interviewed by one of the congressional committees, and he made that statement in effect, that this was what we needed to be doing. It's a nice statement and it made me think of Stennis.

Estess: I said in managing we ought to also put understanding in managing, using space technology to understand and manage the earth resources. We share the same technologies, remote sensing, data acquisition, data processing, physics, chemistry, et cetera.

Dethloff: I'll use that incidentally, for sure, application of space technology to understanding and managing space resources.

Estess: Earth resources.

Dethloff: Earth resources, I mean. Good. I better let you go. I really appreciate this.

Estess: Well, if we have the chance we'll talk again. If you have some questions we'll get back together.

Dethloff: I appreciate that. I sure will.

Estess: She's rung my bell out there. (secretary interrupted) (laughter)

(end of the interview)

Mississippi Oral History Program

An Oral History
with
Roy Estess

Interviewers: Mack Herring and Myron Webb

SSC HISTORY PROJECT

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This oral history is a transcript of a taped conversation. The transcript was edited and punctuation added for readability and clarity. People who were interviewed may review the transcript before publication and are allowed to delete comments they made and to correct factual errors. Additions to the original test are shown in the brackets [ ]. Minor deletions are not noted. Original tapes and transcripts are on deposit in the McCain Library and Archives on the campus of The University of Southern Mississippi.

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Biography

Please see Volume 444, Part I, for a biography of Roy Estess.

AN ORAL HISTORY

with

MR. ROY ESTESS

Part II

This is an interview for the Mississippi Oral History Program of The University of Southern Mississippi. The interview is with Mr. Roy Estess and is taking place on July 7, 1995. The interviewers are Mack Herring and Myron Webb.

Herring: We're on tape—we're on side one, tape one, an interview with Roy Estess, July the seventh, 1995, Mack Herring and Myron Webb and Roy Estess. OK, let me get this one going, Roy. This is our backup. OK. You just said something right then, Roy, about Mr. Balch, about it was all of these types of things that Stennis is about today. Why don't you go back and elaborate a little bit more?

Estess: Well, I was talking about the [time period] after Apollo [when] the population here had gone down to nothing. Charts around here show a thousand people. We were well down below a thousand people. I remember the number between six and seven hundred, and we had a gloomy picture. The space business was not in vogue. Vietnam. The Nixon impeachment would lead ultimately to his resignation. After a couple of moon shots the country had dozed off on space. And since we were a single-mission [installation] here we had nothing to do. [Apollo was over.] And here this investment that the taxpayers had made was just going idle. So Mr. Balch, as you know, was aggressively pursuing an alternate mission, primarily to capitalize on the investment that had already been made. And so if he ever had an elaborate strategy, a detailed strategy, I never did understand it. I don't think he did. The strategy had to do with, what is the general area that we should choose? He, as we've talked before, he believed at that time that the whole issue of environment, the environment, was going to be the thing to come. It turned out he was right. And that we ought to focus on activities that had to do with understanding and preserving the environment. And so he started searching through the government for activities relating to monitoring the earth and gathering data. And if you look at what Stennis Space Center is today in 1995, you will see that the Navy and the Department of Interior, Department of Commerce, all have activities here associated with measuring, monitoring, and understanding the earth’s surface. And later NASA created the Earth Resources Laboratory here to be part of that community.

But what we were talking about, before you started this tape, was [that] I was privileged to go with Mr. Balch to an endless number of meetings and trips over a period of several years that were to meet people in other agencies. What these meetings were about was aimed [at] understand[ing] the function, the facilities it had, how many people it had,

their budget, how they fit into that agency's mission, where they were located, and the power structure behind them. He was gathering all of that personal information so he could then orchestrate the political power he was using. And that political power in the early days was, of course, Senator Ellender from Louisiana and Senator Stennis and Mr. Colmer [5th District representative] from Mississippi. Later on Senator Ellender passed away, and of course it was [then] Senator Stennis. Senator Stennis was the one who really brought it into being. And in the early days, after Mr. Colmer, Trent Lott [took his seat in] the House as a junior congressman. He was along [during] the process. So today our Senator Lott has a historic understanding of the days of the ’70s and the evolution of this place.

Well, [through] all of these meetings Mr. Balch was gaining an understanding of what the potential was and how to lash us all up together. So he in his mind orchestrated this with the assistance of the strong staffers from the Hill. Jim Gerrard from Ellender's staff, you remember, Mack?

Herring: Yeah.

Estess: And Bill Spell. Later Eph Kreswell from Senator Stennis's staff. And all of this was orchestrated. While every agency had its own history and its own set of challenges, which [were] located at various places, it all fit a major pattern. The larger [issue] was that the secondary mission ended up [being] Mr. Balch's primary mission because he saw greater potential in the non-rocket business than he did in the rocket business. So in pursuit of another mission, from the early ’70s, late ’60s rather, through the early ’70s, he was concentrating on [the] pursuit of this environmentally oriented mission. He gave me a break in 1970 when I went to work on the shuttle. In early 1970 he put me to work on the shuttle, and he really wasn't very interested in it himself. But I was recalling for myself this last week, as I was in mission control when we were docking with [the Russian Space Station] MIR, that I got my first shuttle job in February of 1970. That job was to help Mooneyhan as an assistant. Wayne Mooneyhan left in the early summer to go to work for the Earth Resources Laboratory, and it became my job to put together the pitch that would pitch Stennis Space Center as the place to do the shuttle main engine. Mr. Balch really wasn't interested. On the second floor of Building 1100, I had a little office and a few contractors. We put together the pitch that we gave to the Thompson committee in December of 1970, recommending that Stennis Space Center be the place to test the shuttle main engine. So I got my first job on shuttles in 1970. When I completed that in 1970—Mr. Balch was there at that presentation by the way, but that's a whole other story about being put through a rough time. But at any rate, Stennis was selected, and I don't take any huge amount of credit for that. The presentation was OK, and we got a lot of compliments, and Mr. Balch was told it was the best of the three centers, which was Edwards Air Force Base and Marshall and here. But I'm sure that the quality of the facilities and the commitment of the nation to this place, not to mention Senator Stennis, weighed heavy on the committee's [concluding] that this would be [the] place for the shuttle engine.

That decision, in early 1971, for the shuttle testing that started later in 1975 has been the core business and the backbone of the existence of this installation through the ’70s and ’80s and well into the ’90s, and we'll go on into the next century. So it was an extremely crucial time. The decision in 1961 to build the [MTF] to start with. Then the decision in 1971, ten years later, to do the shuttle test work here were two critical decisions in providing the core. Mr. Balch observed, by the way, when we would travel together, “This rocket business will pay the bills, the core bills. We can really do something sexy,” he would say, “great for the country, by working [on the] environment, by getting these other agencies here and make this a national environmental center.”

Herring: Roy—

Estess: Do you recall those?

Herring: Yeah, I wanted to just interrupt you a little bit there for a couple of things. Don't you believe that he, at first, maybe his first motivations might have been for saving the place, but soon after that don't you believe his motivations was a national center?

Estess: Oh yes!

Herring: I mean it was for the national—

Estess: Right.

Herring: He moved from the local to the national.

Estess: But before tree hugging [radical environmentalism] became really in vogue, [he recognized the future emphasis potential]. He really visualized that this environmental thing was going to be a problem, industrial pollution. And it turned out that we were even guilty ourselves here in a minor way, not understanding what the impacts of our actions, you know, with disposing of cleaning [fluids] and so forth. But he was well-read enough and well-connected enough that he knew that this was going to be a major issue. He foresaw the environment as a major thing that needed to be dealt with at this installation. If you [just] could put together an installation that could do that.

Herring: Roy, let me ask you another question here. When he sent you out there or whenever he assigned you to put together the presentation for the shuttle and everything, did he tell you or did you have a sense that that was strictly a temporary thing, that he was fixing to bring you back into the—

Estess: He told me in no uncertain terms, “You go away and do this. NASA wants us to do this. I'm not interested in it.” He told me, “I'm not interested. You know this rocket stuff will come and go.” You have to remember what his relationship with NASA was at

that time—it was strained because he was operating outside the box of proper conduct for a good soldier. He was working with the politicos for the benefit of the place that he was director. He was outside the box. And so that tainted his [relationship with NASA] a little bit. But this shuttle [program] we were trying to get through the Congress was not—he didn't go work the Congress [for the benefit of the shuttle]. He was director here and he put some people on it. He put me on it. He put one other guy that, as I said, left. But he said, "You know [what to do, just do it]. And to the day we got in the car to go to the airport, he never looked at the presentation, never reviewed it, never looked at the charts until we called him to get in the car. And he wasn't happy, you know, he wasn't happy. It was a tough day. He wasn't happy with what he saw [while reading] the presentation [in the car]. He looked at the presentation on the way to the airport, and by the time I got to Washington, my confidence was gone. I was devastated, because he was only grunting and groaning and sucking on that pipe as he had done flipping through that presentation. [He thought it inadequate.] And only after the presentation occurred the next day, with my knees knocking together, and the Thompson committee said, "Well done, Jack. Y'all did a great job putting it together," [did he relax a bit].

Herring: Roy, can you recall—

Estess: —that he sort of puffed out [his chest] a little bit. After having tormented me on the trip the night before, we were walking down the hall [in NASA headquarters] leaving and he gave me a simple one pat on the back, said, "Good job." That's all he ever said. And that from Mr. Balch was a huge compliment. (laughter)

Herring: Roy, can you recall how that when Balch first pulled you and John out of there, oh heck—

Estess: Ken Daughtrey was one.

Herring: Ken Daughtrey.

Estess: Yeah.

Herring: You know Ken came to Old Timer's? I had not seen him for fifteen years.

Estess: I've seen him. He's back [in the country], back in Seminary.

Herring: Yeah. But anyway, how did—can you recall when he first, the first assignments he gave you to do this, or how did the charge get started?

Estess: Well, [yes], it's a little blurry, Mack, but if I recall he called [we] three in, and he segmented the agencies he was dealing with into three blocks. And he said, "OK, Estess, I want you to help me with these agencies and Daughtery and Ivy, [you these]." And

basically our job was [as] data gatherers and data keepers. And in early days all three of us [traveled] with him and met with him at various times. And we would get the data, and we would keep it, and we would try to synthesize it in some manner and have it available to him. It turned out that he could recall—his mind was so good and memory so good I'll have to admit to you that sometimes I was looking for the data and he was recalling it from memory. But I do remember, you know, nothing specific, but I remember in general he called us in, and we didn't really know what [for], here we were just some young engineers.

Herring: I was about to say you were an aerospace engineer.

Estess: Yes, what in world has he got me up here for, and why did he pick me? Well, first of all, he knew we didn't have a lot to do, so he was trying to put us to work. And so he said, "I might as well use these young folks." And so he called three of us up because he really didn't know what he was going to have us do either. He knew we had time available as the test program was winding down, so he wanted to get some staff work done. And so we worked staff work with his deputy, Henry Auter, and his legal counsel, Bob Shepard, his secretary, Ann Westendorf. And we put together this data for him. He would give us assignments. "We're going to go talk to so-and-so and put this together." So we would put together various packages for him, not given to much original writing. We really didn't have any background or experience to know what to do. You know we just—so we put together stuff that we would gather, and he was grimacing and straining and [would] keep us out here till one or two in the morning, you remember, Mack.

Herring: Oh yeah.

Estess: And I've been in this area [of this building], you know, many nights at two o'clock in the morning, and he'd be trying to get [a] package put together. And I don't know what my employees would say now, but he never would ask us, "Have you got anything tonight," or "do you want dinner?" We just stayed. And we'd get through at one and two in the morning. And sometimes then he would dispatch us with instructions. I have personally been sent to Jackson to meet with staff of Senator Stennis on documents that would ultimately wind up in the Congress and would affect legislation. I've been dispatched to Washington, to the Hill. All the time being told by Mr. Balch that, "You're operating under orders from me and any problem that you have is my problem because I'm here; I ordered you to go do this. So you have no liability, no responsibilities for anything that might be done. You're not violating any law. It's my responsibility. Go." And so I was dispatched many times to go deal with the congressional staff, knowing and feeling that I really didn't quite understand it because I didn't have that experience. Feeling that, you know, somehow NASA wasn't going to be happy about me being over here and that I probably shouldn't wear my NASA badge. But I did [go] anyhow. And we would sit with staff and they would ask me, "What does this mean? What does that one mean?" And so my job was to interpret things between what was going on [and Balch's master plan] (interrupted).

Unident. Voice: (inaudible)

Estess: I got a phone call.

Herring: Yeah, we'll interrupt it here, Roy, go ahead.

Estess: Just interrupt here, but you don't have to leave.

Herring: No, we'll just interrupt it.

(brief interruption)

Herring: OK.

Unident. Voice: (inaudible)

Estess: (inaudible)

Herring: Yeah. OK, Roy, let's see, where—let me see where we were. OK, you had gone back and recaptured a little bit with Balch.

Estess: [Yes], we were talking about developing the mission, the center mission.

Herring: Yeah. I guess another thing before we totally leave that, Roy, some of the character or the culture of this place was being formed during this era that you're talking about there. And Myron and I were talking—while you were on the phone we were whispering back here—what sort of influence, how did you feel that that might have helped prepare you for ultimately becoming the director of this place?

Estess: Well, that's really a good question. The culture, the current culture and character of this place was set in those days. First of all, remember that we were out looking for a mission, and the announcement to put the space shuttle here brought a sigh of relief. But Mr. Balch articulated in such an enthusiastic fashion the potential for this environmentally oriented activity here that we saw it as an opportunity to really get involved. While we, NASA, didn't exactly, we didn't have a mission looming [here]—later we did with the Earth Resources Laboratory—we became a service provider with an attitude towards customer service and an attitude of dealing with cost. And it's ironic that twenty-something years later the government is talking about cooperation between agencies, government efficiency, customer-oriented. You've got the vice president out with this National Performance Review saying, “Know your customers, understand your customers and be efficient. Contact, work with each other, share costs, share resources.” That's what we started. That's what Mr. Balch started twenty years ago in this whole concept. So over twenty years later the government's coming around. And now with Mr. Goldin coming

down recently and General Dailey and other notables, and other officials, they say, “Hey, you folks are already doing what the rest of us are trying to get to.” And that's the reason that Mr. Goldin was so pleased when he was here again a few weeks ago. The culture and nature of this place is customer-oriented, know who your customer is and try to please that customer, and give them a deal for their money. And we now have a constant pressure on making sure that we're charging people the right kind of fee for the work that they get done. In the early days there was some subsidy that went on, clearly. In fact the Congress authorized the famous ten-million-dollar set-aside you recall. That was a subsidy to get agencies to move in here for facilities and services. And over the years we've taken those subsidies away. And now our system is based on good customer service but full cost sharing, not cost additive but full cost sharing for this place.

So that culture that you mentioned was set in those early days, and I carry that on because I was involved in it. Today Admiral Gaffney, who was [also] involved in those days, carries it on. I hope that we've been successful in handing that off to those who will come after us. You know you can slip back into “well, that's not our job, that's the other agencies,” because managing this multi-agency arrangement has its share of headaches, you know, because when you cross agencies lines and organizational lines—if you want to be a bureaucrat there's plenty opportunity to be a bureaucrat. So Mr. Balch set that culture in place early on, and we still carry it on. That’s just the way I think, and I hope that others will come [to] and share it too.

Herring: Like I can remember him talking you know to a group or something, and he'd say, “You know to understand like somebody with NOAA or with the Department of Commerce or whoever, you've got to first understand what they're doing and have an empathy from their point of view for what they're doing.”

Estess: Right.

Herring: And that was something that you all were cultivating, and even today I'm sure that you understand that, when you're dealing with these people at a national level and local level.

Estess: Well, you're the historian, but what is it? History repeats itself? Now, we can springboard forward to 1993, ’94 and ’95, even today, where we're in search of another mission. And we are in—I'm following some of the same patterns that Mr. Balch followed. It's not necessary for me to operate so far out of the box now because it turns out that operating out of the box in cooperating with other agencies and working to share facilities is now considered the thing to do, where in those days it was not. So some of the things that I'm being encouraged to do, work with the DoD and being given license to deal with the political folks, is perfectly OK in this environment, in this government, because this government is about downsizing and getting things more efficient, out-sourcing, privatizing, commercializing, and that's the climate we are [in]. So it's much easier for me

to operate today. And I'm only constrained today largely by how bold you can be in seeking the initiative. So in the last two or three years I've been following some of these same patterns that were laid out earlier. And we are currently seeking missions for Stennis again.

Herring: That's over twenty years, twenty-five years.

Webb: Well, in this earlier interview that you ended up, with Dethloff, you ended up saying that a multi-program propulsion test facility to take Stennis to another plateau was your primary mission. And that was your greatest challenge would you say?

Estess: I remember that.

Webb: Uh-huh.

Herring: That was what year? We did that in ’91?

Webb: Um-hm.

Estess: Well, what we've done, what we've done recently is in the last two or three years we succeeded under the leadership of, first starting with Admiral Truly, of getting this installation declared NASA's Center of Excellence for propulsion testing. And as NASA identified its Center of Excellence around all the various centers in the last two or three years, we have been tagged with that designation. We are NASA's large rocket propulsion Center of Excellence, and that's been verified by two administrators, Admiral Truly and Mr. Goldin. And in the recent Zero-Base study in the spring of ’95—when Mr. Goldin had his press conferences recently, he said, “Stennis Space Center is my Center of Excellence for testing. We are going to do our testing there.”

And so we have vigorously been pursuing that [since] working with J.R. Thompson when he did his [study] this modern pursuit of a new mission, Mack, [this] is traceable back to recommendation [number] thirteen of the Augustine Committee recommendation with regard to the future of the space program. Recommendation thirteen of the Augustine Committee said, “NASA, you haven't done”—in effect said, “NASA, you haven't done a roles and missions analysis of your agency in twenty years. You ought to go do that.” So Admiral Truly, who I had an opportunity to work with during that time, wanted to respond to every recommendation. And he wanted to respond hopefully in a positive way, but there were some that he couldn't go along with that. But he assigned that recommendation to his deputy, J.R. Thompson. J.R. Thompson put out a report on November the [eighth], 1991, I believe it was, the day he left NASA. The day he left NASA, at one o'clock in the afternoon, he met with Admiral Truly to give him that report. And it was his roles and missions report. And I was in that meeting. I, at that time, was [working for Admiral] Truly. That report said that we ought to declare Stennis Space Center as our rocket test place, and when we think about testing rockets, we ought to concentrate that testing there.

"They can do it," he said in his report. If you go back and look at his report, "They can do it. They have the most testing experience of anybody." And so working with J.R., we were able to get that declared in his report. It really caught some of our competitors a little bit off guard. And I guess I need to add in a postscript for historical purposes here. There's always been a built-in competition for [this] territory with the Marshall Space Flight Center.

Herring: Can I just make this—well, keep your thought. Roy, Myron will tell you because she has read all of these things. One of these days we're going to let you read it. I'm writing a serious history, and I'm treating that Marshall rivalry from its very seeds, from the very beginning, genesis, starting in '63.

Estess: It is real and it's affected history. It's affecting us today. And I will say that today in my tenure, not only as director but as deputy director, the relationship with Marshall Space Flight Center has never been better, largely due to who the director is, his attitude, Porter Bidwell. Porter has a great respect for this place and its people and its capabilities. And Porter Bidwell is the one who is responsible, singularly responsible, for transferring the SSME test responsibility in 1994 from the Marshall Space Flight Center to Stennis. Porter Bidwell came into that job, and he said, "NASA has made this decision. I support it. Therefore, I'm going to move [the responsibility for] the SSME test work from Marshall Space Flight [Center] to Stennis." And we did it in thirty days under the pressure of [our] authority. Now he's gotten a little bit of heat from that. He got some heat from his own people. He ultimately got some heat from people who transferred to headquarters [in positions] over him, and that decision has been questioned. He sticks by it.

And today as we grapple with where we're going to put future test work—I have been rather abrasive and bold in some—I say bold, I'm not patting—it's just easy these days with this climate to deal with Porter in worrying about when we're going to, where we're going to test the RLV rockets. We had a recent meeting in Washington—we being Associate Administrator Dr. Littles and Porter Bidwell and I and members of our staff, primarily the test community at Marshall—where we had a sort of roll-your-sleeves-up, white-knuckles kind of meeting, and it was the same kind of climate that we had in 1970. Where are we going to put this test work? And today the issue is: Do we put it in the Air Force test facility? Do we put in Marshall test facility? Put it in Stennis test facility? Which one of these facilities is going to be used?

So this competition—the brotherhood is great when you're talking generalities and you're having a social, but when you get down to whose oxen you're going to gore, it [becomes serious]. And it's not just with Marshall, any installation we can have the same kind of competitive situation. So I threw in a postscript here about that relationship.

But let me go back to the central issue. J.R. Thompson staked out the potential for us to be declared the Center of Excellence. Admiral Truly [made] that decision with a December thirtieth, same-year document, 1991.

Herring: Ninety-one or ’92. Let me see if I got it here.

Estess: It's, let's see Mr. Goldin's been here three years this spring so that would be—

Herring: Ninety-two.

Estess: He came in—

(The interview continues on tape one, side two.)

Herring: —side two, tape one.

Estess: The Augustine report was done in 1990. J.R. did his work—he took a year to do his study. It was in 1991. He produced his report in November of that year, and the administrator put out a decision document December the thirtieth. That decision document, by the way, the architects of that decision document were me and—who was the general counsel before Ed Franklin? General counsel before Ed Franklin? [It was Jack O’Brien.] He was working in the front office at that time for Admiral Truly, and he gave the two of us a job to gather up all the inputs from the agency and put together that document. And by phone and fax during Christmas holidays [in] 1991—I had come back home from my job there—we finished that document. Every day we had a telecom with the administrator, and he put together, he made his final decisions and gave us instructions about how he wanted rules changed and so forth. We put that together in a document, [for] he had committed to Augustine that he would deal with all those recommendations by the end of the year. And he put it out on December the thirtieth and [met] his commitment. So that's the reason he pressed us all during the holidays to continue working, and we made it.

Herring: And then it was issued in early ’92.

Estess: It was issued in early ’92, and it was—so that was the first time that we were declared a Center of Excellence. Now, that was a declaration. It didn't come with any programs; it didn't come with any money. But that was to come later, and we're still working with it. Following that, then, in April of the same year, ’92, April the first, Mr. Goldin came. And fortunately I had the opportunity to be asked by him to stay and work with him for a while [in headquarters], which he said would be six weeks. And so at the end of seven weeks, he sent me home, and after two weeks home, he brought me back, and I stayed almost another year working with [the Roles and Missions Study].

But since I had been involved with Admiral Truly—the first Saturday, the second Saturday that he [Goldin] was in the administration, he had a Saturday meeting. The Capitol galleries were across the street from NASA headquarters, and he had all AAs and center directors to come to that meeting, sort of a get-to-know-you meeting. And there he shared with us his philosophy of management and so forth. And during the meeting he was going around the table and asking people what currently was on their minds. Several center directors mentioned the Roles and Missions Study. Several associate administrators mentioned the J.R. Thompson Roles and Missions Study that had just been put on the street by Admiral Truly's decision document. Some didn't like some of his decisions. One of those centers did not like the idea that Stennis Space Center had been declared a Center of Excellence. There were two decisions in that meeting made on that Saturday, the second Saturday of Mr. Goldin's [tenure]. First, he said, "I'm hearing a lot about this roles and missions thing. I need to understand more about that and I need to review what was done and I need to either revalidate it or change it as new administrator." And he said, "So now who's going to take the action for that?" And so everybody in the room turned and looked at me and smiled. And he said, "OK, Estess, you must be the fellow." And so I got the action to work with him to go back through all that roles and missions [issues].

The second action that came out of it is that he said, "I hear [that there's] an issue between Marshall and Stennis with regard to what your respective roles are. Jack Lee [director of MSFC] and Roy Estess, I want you to go away and write down for me how you see your respective roles and put it in a way that I can understand it and that I can agree or disagree." Those were the two actions.

I was working there [at headquarters] for Mr. Goldin. And so I started, agencywide, going back through that document with him, and he essentially upgraded, validated most all of what Admiral Truly had done. He didn't really make any major changes. However he decided we were going to go further than J.R. Thompson and Truly. He wanted [us] to go back and look at the space station. He wanted to look at consolidating science or creating a life science activity. He wanted to go do some other things and go further than we had gone in the previous days. So we set about doing that and that's another part of history, not really directly associated with Stennis.

In the meantime, however, Jack Lee and I set about to—now under pressure of the new administrator—and I was delighted with that pressure, delighted with that pressure, because it gave me an opportunity now to begin to [make progress] on this issue. Mr. Goldin, if you remember, the first center he [visited] when he came to NASA was [Stennis]. He did go to Goddard one afternoon and came back to headquarters. The first out-of-town trip that he took for any center was to Stennis Space Center. He flew down to Stennis Space Center one morning, and Aaron Cohen [director of Johnson Space Center] and Mr. Goldin and I and others came here, and then we went [on] to Yellow Creek [the same day]. So he early gave us an action to write this down. So Jack Lee and I, respectively, wrote an agreement, and that caused Jack to agree that Stennis is going to be

the Center of Excellence. And we wrote an agreement, and we had a meeting in early May of 1992. And in the meeting were Mr. Goldin; Aaron Cohen; myself; Jed Pearson, associate administrator for space flight; and Jack Lee, the director of the Marshall Space Flight Center; and [Marty Kness]. We presented Goldin our respective roles verbatim, and we showed him an agreement that we had signed that said, "Marshall, here's what your role is and here's what our role is." That basically said that development and technology work would be done at Marshall. When it came to propulsion production [testing], and you need [to put] time on engines and engine systems and stages, that test work would be done at Stennis. And we—and since the SSME was a violation of that agreement, under that agreement the SSME would [have] come to Stennis. And Jack Lee couldn't agree on moving the SSME. He couldn't agree on moving it. We put that in a category that says we'll study that later.

So we wrote that down, and we presented that to the administrator, and he said, "OK, I understand. Now write me a letter to Senator Lott and tell him that I understand it and here's our understanding." That letter was prepared. It was ultimately signed by Legislative Affairs not by the administrator. But that letter was sent to Senator Lott [in August] that says, "We looked at this as you suggested and as we wanted to and here's our decision." That then was the next step in pursuit of this place being the Center of Excellence.

The next thing that happened after that is that the administrator decided to make a management change in Washington. He brought Jack Lee up to headquarters to help him put together the future propulsion [program], which was a high priority for the administrator, that is the reusable launch vehicle [RLV]. And he needed Jack, who knew the propulsion business, to come up and help put that program together, work with the Department of Defense and the Congress and so forth. So he moved Jack up to headquarters, and he named Porter Bidwell as the director of the Marshall Space Flight Center.

Well, Porter Bidwell, then, late in '93 comes in and says, "Hey, I read the mail. Two administrators have decided that Stennis ought to be the Center of Excellence for propulsion, and the only outstanding issue was the SSME; therefore, I'm moving the SSME. I'll make that decision." So in April of '94, Porter Bidwell made the decision to transfer the responsibility for the space shuttle main engine from the Stennis Space Center or from the Marshall Space Flight Center, and he declared that it ought to be done by 1 June. And the contract with Rocketdyne ought to be split where the part of the contract that has to do with testing should be transferred [to Stennis] along with the program funding. That was done. And so that, for the first time in the history of the installation, first time in the history of the installation, was the Stennis Space Center responsible for the conduct of the test and delivery of the hardware and the data [to] the developer of this case, the Marshall Space Flight Center and the hardware to the Kennedy Space Center. Twenty-five years, thirty years after the installation was built did the center finally have the

responsibility for the test work. We've always been a facility provider and a service provider, support services, and in 1994, that was the first time we ever got the responsibility, a substantial historical event. And so a major turning point. And today in 1995, the responsibility for testing the space shuttle [SSMEs] and delivering tested [proven] hardware to the Cape for installation on the orbiters to fly is the responsibility of this installation. [This is] carried out by our test engineering director and under the leadership of Boyce Mix. And so 1994 was a pivotal [point], and history ought to record that that decision was made—Porter and I collaborated, but he made the decision.

And history ought to also record why he made it. First of all, he was a brand new center director. He had seen two administrators declare this. The newest administrator, Mr. Goldin, had appointed him to this job. And he says, "OK, I'm going to make this happen." But why didn't he have reservations? He had spent three months here as a deputy director. His own personal history went back to 1966 with us when he was working on the S-II program.

Herring: I didn't know Porter worked on the S-II.

Estess: Porter and I both worked on the S-II program, and I knew Porter in 1966 when we both worked on the S-II as part of Saturn V. So his history of coming to Stennis and his confidence in this installation [go] back to Apollo. When he became center director, he said to me, "I have no reservations about you folks doing this job." He said, "I have zero reservations." He said, "So why should I worry about it? I should just give you this job and let you do it on your own." And so Porter and I met in Huntsville, Alabama, and he made that decision. So history ought to show that while those relationships were there, and we had pursued that, and the administrators had laid the framework, the decision ultimately to move the SSME was not made by the shuttle program, it was not made by—the fact of the matter is we went to the shuttle program, which was Brewster Shaw and to Brian O'Conner and to people like Bob Crippin. Bob Crippin was also briefed on this. Bob had some reservations. [There] was a meeting that took place in early May of 1994. The meeting was in the associate administrator, Jed Pearson's office. Jed Pearson was present, Porter Bidwell was present, I was present, Bob Crippin was present, Brewster Shaw and Brian O'Conner was present. The subject of the meeting was transfer of the SSME to Stennis. And Porter and I briefed the general on the fact that we wanted to move this responsibility. And looming high in that briefing was the fact that Stennis was going to be [NASA's] test place. And General Pearson, now remember, was relatively new as associate administrator. He had also embraced these roles and missions studies. So what was happening here was a change of faces at the associate administrator level, and they were embracing this concept of Stennis being [NASA's] propulsion [test] place. So this meeting occurred in early May. We can get the date for you in '94, where we briefed the associate administrator that we were going to transfer the responsibility for these. The associate administrator in usual form went around the room after the presentation and said, "I want to hear from you people. Do you have any problem with this? Are there any flight safety

issues? Brewster, do you have any programmatic reservations? Brewster said, “I've looked at this. I'm not sure it gains us anything positive in the program, but if it's a roles and missions issue, I'll support it. I do not believe it's a flight safety issue.” Bob Crippin who was—you want me to stop?

Herring: No, no, go ahead. This one's taking.

Estess: Bob Crippin, who was the director of the Kennedy Space Center at the time, said that in his previous job where he was the director of the shuttle program he had reservations about this. Those reservations had been dealt with as he observed the quality of the people that we had recruited into our test capability at Stennis, and he had been briefed on that. As an example, when he previously disapproved of it, he didn't think we had the depth in our staff to be able to manage this. He then was made—he was currently aware that we had recruited for instance three certified SSME test conductors to be a part of the civil service staff. There was also discussion there of getting a tested well-qualified individual to run the testing right away. That played heavily, ultimately, in my selection of Boyce Mix to be test director. The scene for selecting a person like Boyce with his long background in SSME was made in that meeting. In other words, it was clear to me that I needed somebody with name recognition, not only name recognition but capability in SSME, and that's what we did.

Herring: Roy, what was Boyce's title then?

Estess: He was a deputy project manager for a space shuttle main engine at Marshall Space Flight Center.

Herring: Is there one particular document that you know that you could say is a historical document, that makes the test mission official and everything like that, that we need to make sure we get ahold of, that would have been after this meeting, say, in May of ’94?

Estess: Let's see, Mack, your question—was there any document? There was an agreement written between Porter, the Marshall Space Flight Center and us, that Porter and I signed that ultimately put the SSME here. So we updated that agreement. I've got to go back to that meeting. So all in that meeting supported the transfers. And Jed Pearson said, “Proceed.” So we proceeded, and then we wrote an agreement. Porter—he started to look [at] it also, but Porter said, “We don't need an agreement.” He's sort of an anti-paperwork kind of man, [preferring a handshake]. And I insisted that we write this down and put it in [place], he said, “Well, we're going to have a contract and it's going to work.” And so I said, “I think our people need to see this report.” And Porter said, “OK, you write it.” So we wrote it, sent it up there [to MSFC], they staffed it, made a few suggestions, we changed it, and we put it in place. So that agreement now is in place and signed by Porter Bidwell and [me]. And we sent it to Brian O'Conner, the program director, and asked Brian

to sign it, approval for the program, and he did. So that document's also concurred in by Brian O'Conner, the program director of the space shuttle. It's a historical document.

Herring: Well it's—you know you making sure that sucker, that agreement, was written was a good move.

Estess: I think so. We wrote [it] down and it's documented.

Herring: Because you know on this rivalry, you know, Roy that we talked about, or the competition. I felt, even when J.R. was up there—and Myron can tell you that we used to experience at our level, like when you and J.R. are getting along great, there was a level at Marshall that never quit, never quit. One of them was their public affairs officer. I don't know if he has till this day, Myron. But I mean at every, you know, every move, you know you had the whole people up there that they continued to. No matter what we would try to do at our level and at your level. Well, Roy, you would—

Estess: So, let's see. I'm getting distracted by you and by this television here. But, now that was a year ago. Now what's happened in the last year is also important.

Herring: Good.

Estess: Because now we are moving to the next level, which [hasn't] resulted in documents yet. So what have we done the last year? The administrator initiated something that came to be known as a Zero Base Study. And the Zero Base Study, it was chaired by Mr. [Richard] Wisniewski, which is historically significant in that Mr. Wisniewski is probably the most knowledgeable person in headquarters on how the Stennis Space Center has evolved and how it works. He returned from retirement at the request of the administrator to help with some of these NASA restructuring issues. So he, the administrator, chose Wisniewski to head up this team. This team was populated by some of the most talented people in the agency, in my opinion, largely deputies of AAs at headquarters, really some talented people. And those names are available to you. And the reason I mention that is that the makeup of this team is very important in that their credibility is almost impeccable. They're all internal NASA people, and they set about doing this Zero Base Study, which basically was another Roles and Missions Study. And they made recommendations, they were to make recommendations on how NASA could be restructured, roles and missions-wise, with an idea of being more efficient. And since Mr. Goldin had [arrived] on board, government was continuing to downsize. NASA's budget continuing to be cut, and there was continued pressure and desire to eliminate duplication and gain more efficiency. So this was driving us to look further even more. So here was an opportunity again.

So that study [Zero Base] was initiated in 1994. There were two other studies that need to be mentioned for historical purposes. There was a National Facility Study that was

initiated by NASA in concert with the DoD to examine propulsion facilities nationwide, to identify what their capabilities were. And this document, this was completed. Gerald Smith, our deputy here, led one of the major—there were three or four teams in there, and Gerald led one of those teams. The overall study was headed by Dick Kline [NASA headquarters] in Washington. And that National Facility Study catalogued all the propulsion facilities around the country, including Stennis Space Center. Now, there were no decisions made by this document, no recommendations. It was a data gathering exercise, but [it is] important and that's the reason it needs to be recorded. I'll come back to it.

Webb: And we've got the summary right here.

Estess: Secondly, the White House initiated an effort called the National Laboratory Review. The National Laboratory Review was designed to look at the DoD, NASA, and the Department of Energy and identify the capabilities of its laboratories facilities with the idea for ultimately making decisions to which ones to use and which ones to eliminate.

So that's three major studies that have been underway in late ’94. Early ’95, the Zero Base Team of NASA—we'll go back to it—goes around to all the agency, all the centers, and reviews what we're doing, and they [issue] a report. By the way, our study [the Stennis part] was done here by a number of people. Lon Miller played a major leadership role, Robert Bruce and many others. And we made our presentation to the Zero Base committee at the Kennedy Space Center. We traveled there rather than them coming here, and we made our presentation down there. The presenters were me, David Brannon, [Tom] Sever, Lon Miller, Robert Bruce, [and Doug McLaughlin], and that's a real team.

Webb: McLaughlin?

Estess: Huh?

Webb: McLaughlin.

Estess: McLaughlin, yes. And that's all a matter of record and those charts are available. We were very pleased with that presentation. The committee was frankly somewhat overwhelmed with some of our ideas. Well, see, the reason I mention that meeting, in that meeting was the first time that we, Stennis Space Center, proposed an alliance. And I had dreamed up the name, the National Propulsion Test Alliance. I wanted to give it—it just sounded good. And since then it's become NRTPA [National Rocket Propulsion Test Alliance].

Webb: I didn't know that was your coinage.
Estess: So I came up with—so I coined this term the National Propulsion Test Alliance, and that's the first time that I proposed it, at that meeting in Florida. And the two singular things that really stood out in that meeting, that hit that team, was the idea of an alliance

and the quality of the science that was here presented by Sever. The team ultimately—the science [activities were] under attack and was really going to be killed here. And Tom Sever in that meeting succeeded in making them aware that the benefits here far outweighed the liability or costs. So ultimately that decision made. That's not propulsion. So that is historical though in terms of a mission because there Sever made a very effective presentation, as did David Brannon, that ultimately resulted in the remote sensing community remaining intact here at the center. [For] it was on the chopping block as it were.

But the Propulsion Test Alliance was proposed at that meeting. At all the subsequent review meetings and presentations by the team [Zero Base Team] to NASA management, when it came to the Stennis segment of the presentation, prominent on their charts [was], "we like this idea of a propulsion testing alliance." Why did they embrace it? It wasn't because—and why did we offer it up? These are the real questions. Because there are some hazards there. The idea of a propulsion test alliance is that you would—you go back to the facilitate study, the National Facilities Study and the Laboratory Review, and you look at all the propulsion facilities in the country, and through some process you would decide what are our [country's] premier facilities. And you would identify those as your premier facilities against certain needs and capabilities. As an example, if you want to run ten-million-pound [thrust] vehicles, you run it down at Stennis. That's the only place you could do that. If you want to run sea-level engines, three or four hundred thousand pounds, you do it at Stennis. If you want to run bearing tests for new kinds of bearings, you'd do it in the test area at Marshall Space Flight Center.

So it was my view that to settle this twenty-five years of constantly bickering about where we could do that, I was willing to roll the dice in an environment of national competition, believing that we could win on merit because of the quality of our facilities and our reputation. And that while we may lose a facility—as an example I may have to sacrifice the whole test facility—that in the end if I could get some sort of national propulsion test alliance with the DoD in place and a declaration that this facility be used for that, then I could put behind us the twenty-five years of bickering over which facility is going to be used. And, that we could stop, we center managers, Air Force, NASA, from continuing to maintain and invest in these duplicate facilities. And if we could shut down some facilities and invest in other facilities, we ultimately could save the taxpayers money. That's why the team picked up on it. They saw it as a vehicle for going back and letting NASA deal with National Facilities Study and with the White House's Laboratory Review. And so that's the reason it caught on. When it got to NASA management, the administrators there, they said, "Good idea."

Well, I'll jump ahead now to today in 1995 when we're doing this interview. The administrator, the deputy administrator, picked it up, and I'm sort of tagging along with it. I'm doing—I mean, they've picked it up and they're running with it. And we're still working [on it]. So we propose the test alliance, and today our management team is working on that

because we believe in that environment that we will emerge as really the declared, the center of excellence, but what does that mean? And now we need a declaration that when you do this kind of test work, you go to Stennis. When you go and do another kind of test work, if you do hypergolic small thrusters you go to White Sands. So we proposed this propulsory test alliance on this date in Florida, and so you ought to get that date.

Herring: Yeah. That's when? approximately?

Webb: I can get it.

Herring: OK.

Webb: (inaudible)

[The Zero Base meeting at Kennedy Space Center was held March 31, 1995.]

Estess: And so I have those presentations, and they ought to be interesting. We proposed this propulsion test alliance. Subsequently in a press conference, just recently, [the] administrator unveiled the results of a Zero Base study. In the Stennis section, he said, "They're my Center of Excellence. We're going to move all of the testing down there, and we're going to pursue a National Propulsion Test Alliance." So there's a historical document [associated] with a press conference that he put out. Subsequent to that, one code, one associate administrator, Code X, Dr. Mansfield, put out guidance for the POP that said, "I just read this zero base—

(The interview continues on tape two, side one.)

Herring: We're talking about—let's see, where were we, Roy? in Jackson?

Estess: We were talking about the propulsion testing alliance.

Herring: Yeah, yeah. OK, go ahead.

Estess: The press conference resulted in at least one associate administrator, Dr. Jack Mansfield, putting out guidelines for the POP [Program Operating Plan] which said that the next program, reusable launch vehicles, that test work should be done [at Stennis]. Now even though that's declared in the POP guidelines, the issue of cost still has got to be dealt with. What I'm painting for you here is a picture, an evolving picture of roles and missions, [the] transfer [of] the SSME down to the National Propulsion Test Alliance, [and] as we speak, the administrator has met with the Air Force, and NASA has an effort underway to reconstitute something called the AACB, which is Aeronautics and Astronautics Coordination Board that is a framework for cooperation between the DoD and NASA. And our propulsion alliance idea has been rolled into that. And alliances are now being

considered in launch facilities, manufacturing facilities, R&D facilities, satellite development facilities and so forth. Meetings have occurred already, a significant meeting with the secretary of the Air Force and chief of staff, Mr. Goldin and General Bailey, with regard to that. We have provided our ideas of how such an alliance ought to be worked. Also we've been authorized and instructed to continue to develop the ideas for this alliance. And in that regard we have met with the Air Force, the Arnold Engineering Development Center, and we're planning a trip in August to Edwards Air Force Base and the Phillips Laboratory located there. And we've also traveled to and had visits from the White Sands Test Facility and Marshall Space Flight Center. We put together a team, and a meeting will occur here at Stennis next week with interested installations on fleshing out how this alliance might work. And again it would be not an organizational realignment at this point, although at the Washington level they may ultimately consider that, and I would suspect they might. But at our level right now we're considering an alliance where we identify our respective capabilities and come to some agreement, if we can, on what class of testing will be done [at each facility]. And so this alliance activity now is being worked by our people. And so I'm pleased to be helping to drive that. And so we are, as we speak, in the throes of driving for a new identity for this place.

Now, we have the [responsibility for the] test work associated with the space shuttle main engine, and we're reducing that as we [downsize] the shuttle program and as we finished the [planned] improvements of engines. What we want to replace it with is the next generation of vehicles, the reusable launch vehicle and also the enhanced expendable launch vehicle, the EELV so called, from the DoD. We want our facilities to be considered in any major new propulsion development in the country. We're also, of course, pursuing the commercial test work, and we have accomplished some tests. We also are working with all the major engine and air frame manufacturing to offer our facilities to them. So we are very aggressively pursuing an enhanced propulsion role for [Stennis].

Now, in the tradition of Mr. Balch, at the same time we are working very closely with the Navy and privately [with the] partners for Stennis to pursue other work for this installation. And then certainly we want to mention the fact that our commercial remote sensing effort is out in front in terms of working with industries to commercialize remote sensing. [This] has really caught the eye and excitement of the administrator. And the administrator is bringing down a congressional visit later this month on a Saturday, and they're going to be taking a look. Some notable names in this congressional delegation like John Glenn or Senator McCulsky or Senator Walker, I mean, Congressman Walker, who are going to come down, and one of the things they want to look at this [commercial] remote sensing capability. It's a potential huge market. Mr. Goldin uses his number, ten million dollar, ten-billion-dollar market. It's roughly the equivalent of the communications satellite business. So it's a huge, potentially huge market there—although I'm not sure [just] how big it is—but we are playing a key role in that here at Stennis, and we intend to build that up, build that as a major mission.

You remember, Mack, historically we had a very aggressive Earth Resources Laboratory basically oriented towards applications development. It sort of waned, went down for several factors. Some of our fault here, leadership problems here. Maybe I was part of that problem. And we've changed leaders several times. We've reorganized. And several factors in headquarters where the program directors had somewhat interesting minds, an overall state where the business changed. And in the last few years we've reshaped it, under the leadership of David Brannon and others. And now it's got a focus on [the] commercial [market], and it's doing very well and growing. We've added a couple of new people to it, and we have plans to add [even] more people. And so we're continuing to develop our remote sensing and nonpropulsion activities that we know about, and we're working with our resident agencies to enhance that area.

And further, we have initial discussions underway, Mark Craig and our management team—we've got a new management team here at Stennis. We're going to have a [planning] retreat in September. So we've got our new management team, and I want them to focus their fresh minds on: where are we? what are our big challenges? where should we be going? I want to talk through this pursuit of a mission. And I want to stress that [we] know there's always a self-preservation interest on the scene. But it's too late to be worried about—I mean my interest is preserved. What I'm interested in is capitalizing on this great opportunity [at Stennis]. You've got a workforce of people here [where] the work ethic is very high. You know historically they, they get it done. The output per dollar has been observed by many notables to be the very highest in the government. You have a certain patriotic and morals frame that's strong to do this work. You get quality work for a minimum investment. Now, [Stennis] is a national asset. It's a national asset of people, in the facilities, and buffer zone, one cannot have this job without having a sense of obligation to try to use it. My biggest fear every morning is, what am I not doing today that ought to be done. And so as I compare my daily activities with Balch, I'm sure I don't have the sense of direction and vision that he had. But I can remember bouncing off the walls, trying to figure out where the exit out of this maze was. And many days, as we pursued this propulsion [mission] I found that I was amazed that we continue to prevail on this. But you just keep on [going]. And if you go back and look at the last four or five years, and as I had the chance today here to recount this for you, it is pretty exciting.

Herring: Well, I find you to be extremely enthusiastic.

Estess: It's pretty exciting as you go back and review that, as to the success we had. And I wonder why it happened. The moons lined up, and I didn't have a thing to do with it. You know it was the right administrator, that things changed, and then when another administrator [arrived], Goldin even made changes that [have] helped us substantially. He's pushed this even further forward. He's challenged us. You know recently he was down here and the last thing he said to me before he got in the van out at the test complex, he poked me in the chest on my tie and said, “This is a good place. Don't you screw it up.” (laughter)

Webb: And he has a soft place in his heart.

Estess: [Yes!]

Webb: Special place in his heart for Stennis.

Estess: The next to the last thing, he told Dr. Littles and I, he said, "I want you people to give me a plan. This is a going-out-of-business deal down here if we don't do something about it. I want you to give me a plan that, when I look at it [Stennis] next time, that that's not the case." And then he poked me in the tie—this is private here now—he poked me in the tie and he said, "This is a good place. Don't you screw it up." And after the [Washington budget] press conference where he announced that Stennis would continue to be [NASA's test place]—and I've already recounted that for you—he called me up thirty minutes later after the press conference to remind me of my action items. And one of my action items was that, "You owe me a plan on growing this commercial remote sensing [activity]. I want this substantially enhanced from where [you are] now. You owe me a plan." And we're working on that and we'll have it in a couple of weeks.

And he gave me four action items. I'll not recount them all here, [as I said] one of them had to do with commercial [remote sensing]. But then he said, "I intend for Stennis to be [the] propulsion test installation in NASA. We're going to do our test work at your place." But then he added the postscript, which was very important, he said, "However, it's your job to make sure this the cheapest place, the most economical place, the most efficient place to get that work done. You can lose it. Don't be smug. You can lose it. You've got to make sure that your people understand that they've got to control costs and they've got to do what I've seen them do and that is produce at low cost, because we can put it down there but it's got to make sense." And so that's just a few weeks ago.

And so [even] as we speak, this administrator—you know I hope we get this RLV. But this is not just going to fall down out of heaven. We still have to work hard every day to earn this, and we have to keep our costs under control. And I'm sure our team, I know our team has that message. On any kind of level playing field with any other federal installation, I can tell you we'd beat them on cost every time. The other places where we'd beat them, like in depth and engineering capabilities and analysis, but when it comes down to test time and mounting a device and firing it, nobody can beat us cost-wise. Mr. Goldin wants to make sure that that's the case. He also wants us to modernize our facilities. That's an action he gave us. We've still got some facilities that are antiquated from the Apollo days, analog controls and measurement systems that he wants us to upgrade. We will enjoy doing that when we can find the money. So—

Herring: Well, you are very enthusiastic. That impresses me.

Estess: [Yes.] Some days I'm—I'm enthusiastic now because the administrator sees the potential here at Stennis. You see this is—I mean I didn't create this climate. Up in Washington now they're trying to figure out, the White House is trying to figure out, how to downsize this government. And it's clear to everybody that the government has more facilities, more places, more than we need. Now, so what do you do with it? You have all these mangers out there like Estess painting them and writing brochures and trying to sell and keep them all. That costs money. So if somehow you could deal with the politics and the sandbox mentality that all these managers and agencies have, from a government-wide standpoint, you ought to be able to decide which is best and which is not and keep which is best and close down what is not. Now the political reality is you can't always do that, but that's what you ought to be able to do, and Mr. Goldin is committed to the best government even if it means shutting down [parts of] NASA. He believes, however, that NASA—as I do—that in an objective evaluation that NASA will emerge with its share, more than its share of capability. But it may be that we give up some things.

Herring: Roy—and I'm not just saying this, you know, because of our long friendship and everything—but don't you feel that your formative years as a manager, I mean we're going to go back to the ’60s and come through the ’70s and the ’80s and all, that when you're talking to Goldin and all and the other national managers and the other center directors that to be bold and to talk about things like this alliance and to do these things, don't you imagine that's refreshing to these people because aren't they dealing primarily most of the time with people that this is out of their experience realm. And yet this is where you—

Estess: Well, very few of our NASA managers have any experience that relates to downsizing NASA and the government.

Herring: Very specialized.

Estess: Most of them are highly technical, more technical than I am, and highly accomplished people, more accomplished than I am, in their own right. And I envy their abilities. But most of them have not had to survive or not been a part of survival. So they've grown up in installations where things just sort of rolled in. How these programs got assigned, they don't know. And the need to scrap [fight for work] and to decide what should stay and what not to stay has not been something that most of the managers had to deal with. But, boy, they're having to deal with it now, all of them are, and it's not fun. It's a whole lot more fun to manage when you've got plenty of money and your budget [is] going up. When they're going down and you've having to decide what you're not going to do and what you're going to shut down and whose job's going to be eliminated, that is no fun and not pleasant. And that's where we find ourselves. You're dealing with people's lives. If a manager like me, if we ever get to the point where that doesn't bother us, then we're lost. Because you have become too hard or too cynical to really be an effective manager. If it ever gets where you forget the impact, what you're doing to the people, [then in my opinion you cannot call yourself a leader].

But the American people clearly want this government downsized. I strongly believe that there's a great support for us in space. But they don't like to see us fail, number one, and they don't like to hear that we waste money. So we all in government are being held to a higher standard. Buddy, if you can't prove you need it, we love you, but get out of the business and quit borrowing the money to do it, [a reference to the national debt].

Herring: You know it's like, Roy, this thing I was watching last night—and I just lucked in with that. I was telling Myron. I watch that Crossfire every night, and I get a big kick out of it. But this Republican congressman from New Jersey, I mean he was highly critical of the space station and Goldin, but the one thing that he was not critical of, that everybody, he said, you know, "Where I think NASA should be going is they should be developing a reusable launch, another generation of launch vehicles that is less expensive and easier to operate and cheaper to operate better than the shuttle." So even though he was critical of the space station, you know, with all the money that's been spent on the space station, stating Goldin was—I told Myron I thought Goldin did a very, very good job of defending.

Estess: Well, I'll tell you—

Herring: But I was impressed, though, that, hey, you know, even critics are still looking at NASA to do some great things in the future, even the critics. So I think it's out there.

Estess: Mr. Goldin is very articulate when it comes to—but he's really a visionary and innovator. If you go back and watch his, look at his speeches and rhetoric for the last two years, first of all like everybody else, he's learned. He's learned to be an administrator. Now he's a damn good administrator. He's really learned. It was a little hard getting in sync with him. A lot of people couldn't stand it. It was hard getting in sync with Dan Goldin. But, boy, he has learned how to be an administrator, and he can translate that vision now in a way that the management team he's got can implement it. We don't always like it because it's not fun having to [downsize]. But anybody who doesn't believe the space shuttle cost too much money—and we've got to do something about that—has got his head in the cellar because we just—the way this government's going in terms of downsizing we've got to come to terms with it. And the reason I've been converted is I'm one of those guys that two or three years ago was sitting around saying, "We can't cut this thing anymore." The last twelve months we've run over fifty thousand seconds of test time, the largest amount of testing in the history of this installation in the last twelve months at Stennis. Over fifty thousand seconds space shuttle test time in Stennis last year, in the last twelve months, and we did it with a hundred fewer people in the test complex and one hundred fewer support people. And we have cut the team, and they still did more work. Now, how long, how much more of that we can do to them, I'm not sure. The ice gets thin out [on] the side. And I told Congressman Livingston, chairman Livingston last Monday when he was here to visit. I told him those numbers and boy, he said, "I'm proud of you guys at NASA." He observed, "You folks in NASA are out in front of the whole government."

Herring: I was going to ask you what his because he's tough.

Estess: He said, “You all are out in front of government in this downsizing.”

Herring: Oh, that's great to have him because he, Roy, I see him on C-Span a lot. I'd say he's in the top two or three leaders in the Congress now.

Estess: However, I did warn him that, you know, there's a point out there beyond which we lose our ability to function. And I said, “Frankly, at Stennis here, I don't know where it is.” I used to think I did, but I don't know where it is. I keep on squeezing this place, and people keep stepping up and doing the work, walk a little faster and work a little harder. But sooner or later they can't do anymore. And it gets to be—you've got to have so many people to do your core business. And so what we're trying to do is put the sensors in place, if you will, to sense when [we’re] getting in trouble. And there's some early indicators, and the most important thing to us is safety of what we do; safety to people and safety to hardware. And we believe our procedures and processes are right in our most critical areas, such as testing, that the first indicator that we got a problem will be schedule. And we don't believe things will blow up. We don't believe we’ll have the shuttle crash. But we believe our processing procedures are so well defined and well documented in process then if you maintain diligence in implementing those procedures properly the first thing will happen to us that will be a red flag is we won’t make schedule. And we start asking ourselves, “Why aren't we making schedule?” And we'll then come to the conclusion that we must be at the minimum we can go without making a major change in requirements, and we also are looking at requirements. We may decide to stop doing some things that we are doing to relieve schedule again. So it's a new management environment.

Herring: Roy, I'm not putting you on the spot here because, you know, whatever we talk about here we're all going to make sure that we're not going to get nobody in trouble. We're going to have a good history, but we're not going to get anybody in trouble. Don't you believe that you, being a product of this organization here and being an integral part of it all these years and even just like, you know, you've said that a lot of these notables on all the way up the line have always recognized that our little team could do things cheaper, quicker, better, than these big organizations, don't you think that you can accomplish these things with the shuttle better than Marshall? And I'm not saying, putting you into competition, that's just my own knowledge there.

Estess: Well, it's hard for me to say that Stennis can do the propulsion work better than Marshall. Marshall has—it depends on what you mean by better. We can run a test. We can hang a device and run a test cheaper than Marshall.

Herring: That's what I'm getting around to.

Estess: When it comes down to understanding the fundamentals of bearing designs and cooling flows and the engineering and scientific depth [of analysis] that backs it up, Marshall has that capability, [but] it's not as strong as I wish it [were] or as strong as it was in the early days. It's deteriorated because they've not had the programs to keep it as sharp as it was in Apollo. There is a role for the Marshall Space Flight Center and there is a role for Stennis Space Center. And, frankly, if you didn't have both of them you probably wouldn't go build both. If you [started] out to rebuild NASA, you wouldn't have nine centers either.

Herring: Yeah.

Estess: You'd probably have five or six. But you've got them. And if the budgets get worse and worse and worse and worse, somebody may be able to make a decision to close one of them. Now, here I'm not belittling NASA management at all because NASA management, I believe, would make that decision. But they've made some decisions—we've made some decisions in the last two or three years that we had to eat because of political realities. I mean this government is run by three branches of government. So we have to deal with the other branches too. So [the] political realities come into play. We don't have absolute authority over everything. So your question was having to do with Marshall. There is a role for Marshall in technology development. There is a role for us in propulsion [test]. Our product is validated and certified data. We really don't care who the developer is. We'll run the product for them [and give them the data].

Herring: Sounds to me like, Roy, that you've already gone to a level of not just surviving but into making a major contribution to—

Estess: We're well beyond surviving.

Herring: —to the national good in making this place a part of the national contribution to the national picture rather than just getting by like so many. So many of these places, Roy, when you watch these base closing things and you watch these centers, you see people that all they're doing is just like circling the wagons. "What can we do to stay alive?" It looks like what you're doing is not only staying alive, but that's a minor thing.

Estess: [Yes], I think we'll make it. Some days I really feel like the challenge is too much, but for our size I don't think anybody does any better job than our two hundred people and our colleagues employed as contractors. We don't—you know I go to other centers and I see all these fancy charts that represent hundreds of people doing in-depth analysis and market research and scientific investigation, and I get sort of green with envy of having that kind of in-depth capability. And I'm told by my friends in Washington, if you would count how much that costs, is it worth what it costs? But we don't have that here. So sometimes I feel inadequate with regard to our ability to do in-depth measures [analysis]. [But we get our job done very well at a reasonable cost.]

Herring: OK.

Estess: Why don't you turn that—

Herring: Yeah, let me turn everything off here a second.

(end of the interview)

Mississippi Oral History Program

Stennis Space Center History Project

An Oral History
with
Roy S. Estess

Interviewer: Roger Launius

2002

This oral history is a transcript of a taped conversation. The transcript was edited and punctuation added for readability and clarity. People who are interviewed may review the transcript before publication and are allowed to delete comments they made and to correct factual errors. Additions to the original text are shown in brackets [ ]. Minor deletions are not noted. Original tapes and transcripts are on deposit in the Stennis Space Center History Office.

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An Oral History with Mr. Roy Estess

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Biography

Roy S. Estess, a native of Mississippi, serves as director of NASA's John C. Stennis Space Center in south Mississippi. He is responsible for accomplishing the center's current missions, NASA's lead center for rocket propulsion testing and lead center for implementing commercial remote sensing applications. Other responsibilities include managing the Space Shuttle Main Engine test program; planning and accomplishing advanced propulsion test activities for NASA, some Department of Defense projects, and certain industry propulsion development and launch vehicle development programs; conducting research and technology development in earth and environmental sciences; commercializing remote sensing technology in cooperation with industry and government; developing technology for use in propulsion test and launch operations; and managing the overall center. Stennis Space Center is a unique federal city and is home to more than thirty federal, state, academic and private organizations.

Mr. Estess graduated from Mississippi State University with a degree in aerospace engineering. He also has accomplished various graduate level studies, including completion of the advanced management program at the Harvard Graduate Business School. He is a registered professional engineer in the State of Mississippi and is a member and past chairman of the advisory committee to the College of Engineering at Mississippi State University. Mr. Estess is also a member of several professional societies, some of which include Tau Beta Pi; the American Institute of Aeronautics and Astronautics; the Mississippi Academy of Sciences; and the National Space Club.

He has held various engineering and management positions during his forty-two years of service in the United States government. Thirty-seven of those years have been spent with NASA in support of America's space program. From 1980 through 1988, Mr. Estess served as deputy director of Stennis Space Center and was named director in January 1989. From 1992 to 1993, he was temporarily assigned to NASA Headquarters in Washington, D.C. as a special assistant to two consecutive NASA Administrators. From February 2001 to April 2002, Estess was temporarily assigned as acting director of the Johnson Space Center in Houston, Texas.

He has been named the recipient of numerous awards and honors some of which include the Presidential Distinguished Service (twice) and Meritorious Senior Executive Awards; NASA's Distinguished Exceptional Service, Equal Opportunity and Outstanding Leadership Medals; the National Distinguished Executive Service Award for Public Service; and the Alumni Fellow of Mississippi State University; as well as Citizen of the Year in his hometown.

Mr. Estess and his wife Zann reside in Pearl River County, Mississippi. They have two children and two grandchildren.

Public Affairs Office, Stennis Space Center
July 24, 2002

AN ORAL HISTORY

with

ROY ESTESS

This is an interview for the Mississippi Oral History Program of The University of Southern Mississippi in conjunction with the Stennis Space Center. The interview is with Mr. Roy Estess and is taking place on June 25, 2002. The interviewer is Dr. Roger Launius. Also present is Myron Webb.

Launius: This is the Stennis Space Center. We're talking to Roy Estess, the center director. It's the twenty-fifth of June 2002. I believe this is the third time that we've done an oral history with you. There was one by Henry Detloff in 1991. There was another one that was done in 1995 that you sat in on and I'm not sure who the interviewer was.

Webb: Mack [Herring].

Launius: It was Mack, OK. And this is the third time. What we'd really like to try to focus in on this morning is kind of, mostly the experience since 1995.

Estess: Sure.

Launius: But we'll go back a little bit in time and I've got a few questions based upon those earlier interviews that I'd like to ask you. I guess the first question I've got is, you are the one center director and the *only* center director that served throughout the entire time that Dan Goldin was the administrator, almost ten years. You, I think, were made center director here in 1989.

Estess: That's correct, um-hm, January 1989.

Launius: And have served continuously—well, with an interim over at JSC [Johnson Space Center] and perhaps some other detached duty—continuously since that time. What did you view as your—when you became the center director in 1989 and for the next two or three years, what did you consider your number one priority or your number two or three priorities that you had when you came aboard?

Estess: Well, at the time I became center director in January of '89, I had been deputy for some seven years under Jerry Hlass. And previous to that, I had been trained by the former center director, Jack Balch. And that training involved saving the place [refers to finding a mission for Stennis] after Apollo. And I was a bag carrier or aide to Balch, and we traveled all around. And I was involved from an aide standpoint in the transition of the Mississippi Test Facility to the John C. Stennis Space Center and to a multi-agency federal laboratory. And so I know the history of all of those. [I saw] my opportunity to take over as director as a mandate to continue the work that had been started by Jack Balch to build

this place into a multi-agency federal laboratory. That mandate was also [embraced by] a young congressman named Trent Lott.

Launius: Um-hm.

Estess: I had known Trent [since] he was a [congressional] staffer and then as a congressman. As deputy center director, I was *relegated* to taking care of the congressman while the center director chose to focus his attention on, I think rightly so, Sen. [John C.] Stennis. Roger, I might insert here that Dr. [James C.] Fletcher [was] quiet and reserved and [was such] a gentleman. He was a wonderful man. He named this [installation] twice. He changed its name [from the Mississippi Test Facility] to the National Space Technology Laboratories [during his first term]. And then [during his second term at NASA] he decided to talk to [President Ronald Reagan] about changing it to the John C. Stennis Space Center. And so Dr. Fletcher was aware of the importance of the place politically and also programmatically. [As deputy director, I was involved with preparing the documentation for Dr. Fletcher.] And so when I took over, my selection [occurred fairly] unceremoniously. I got a call from Admiral [Richard] Truly, who at the time was associate administrator for space flight. [He] said, "I want you to come up here and talk to me about your future and the future of Stennis." So I went up and he informed me that there were six candidates that he [was considering but] that he had chosen me as the next director. And he did not give me a huge mandate. He said, "I want you to run the place. I want you to do a good job on testing the shuttle main engine and build the place and do what you think is right." He said, "By the way, Jim [Fletcher] wants to talk to you." And so I went over across the street to the [other] building, as we were in the old days, and talked to Dr. Fletcher. I had known him for several years, having been the chairman of the Equal Opportunity Council for three years [working] with [Dr.] Harriet Jenkins. I had met with him several times on that important subject. And so I knew Dr. Fletcher and he was just the nicest person you'd ever seen. He told me that [I] was Dick's selection [and] that he agreed with it, that he supported it, that he wanted to help me in any way he could. I was free to call him anytime, get his help. He would look forward to serving with me. It was a very, very nice meeting with Dr. Fletcher.

Then historically it's fair to record another conversation. Noel Hinners, who had been the director of Goddard and at that time was [the associate deputy administrator], the number three man in NASA, did not support my selection. And Noel came to me and told me very straightforward that he had not supported my selection for one important reason: I had not served a time in headquarters and therefore I would not have the kind of insight he thought that I should have to be a center director. And he thought that was a requirement. However, he said, "You've been selected. I fully support it. Any way I can help you, I stand ready to do that." Then he invited me out to dinner, and he and I went out to dinner. And Noel Hinners became a very close associate and confidant over the years. In fact, until his recent retirement [from] Lockheed Martin in Denver, I have remained in contact with Noel, visited in his office several times and talked with him. He really hit that subject straight on, and it gave me a little lesson in how to handle things like that. Here's a guy who had not supported my selection for [a] reason, told me, and then turned around and became a real confidant and advocate and supporter. And so I learned a lesson from Noel. That was a classy thing to do. And so I really appreciated Noel over the years for his candidness and straightforwardness. But he had a point about serving in headquarters.

Launius: Did he change his position?

Estess: No, I don't think he did. And others over the years have had that same position, and frankly, I share, I'm sympathetic to that position, not rigid on it. Others have had that position, like Howard Robbins—

Launius: Um-hm.

Estess: —had that same position. After having [my assignment at headquarters] there ten years to twelve years ago and serv[ing] for about a year working with you [headquarters] folks and Goldin, I understand what they're talking about. [From the field center], you really do not know what people in headquarters deal with unless you go up and deal with it on a daily basis. And so I think there's some merit to leaders in NASA serving up there, but I don't see it as a rigid rule. Once you make a rigid rule, the next thing you'll want to do is change it because you have some good reason to change it. But it is a good idea to cycle people through headquarters. It's also a good idea to cycle key people from headquarters through the field some.

Launius: You bet.

Estess: So Noel's idea at the time I thought was not good. Now, as I'm more mature and have been to headquarters myself, I understand where he was coming from. And so I've expounded considerably on your original question but I—

Launius: That's OK.

Estess: I came into this job feeling that I had a mandate to carry on the legacy that Jack Balch had started, Jerry Hlass had continued. Jack Balch set an agenda for [the] new Stennis Space Center, [and] in the process, we alienated headquarters. We were thrown out of the family, didn't have a place at the table [management]. Jerry Hlass's great[est] contribution [during] his [tenure] was [that] he [got us a seat at] the table. He was a NASA guy through and through and he brought us back into the fold. And then my job was to keep us in the fold and continue on with the new Stennis Space Center. And that's what we've done, and frankly, that's the reason I'm still here. I contemplated leaving.

This is a little side story. In 1992 I was working for Dan Goldin in headquarters and trying to get to know [him]. I have a great respect for [him] in his own right, but I said, "Golly, if I ever get to be fifty-five years old, [retirement age], and get back to Mississippi, I'm getting out. I can't take this." [But] when I got to be fifty-five I had gotten to know Goldin and—what endeared me to Goldin? No two people could be more opposite. He's a [Jewish] fellow from the Bronx, a second-generation American. Me, I don't know how many generation American, but of Baptist descent in south Mississippi. We could not be more opposite. And I always thought that one of the reasons that he put up with me [was] because he found me to be some sort of interesting anthropological oddity who needed help. I think, though, that what Dan Goldin and I shared—and a lot of people don't know this about Goldin, that underneath his gruff exterior and [the] seemingly impervious barrier around him was a man of deep conviction and total commitment to NASA, the idea of NASA. And a man with more of a nationalistic attitude than most of us even have. He

really loves [this] country. Now he goes about it in bizarre ways sometimes, but his intentions and his motivations are absolutely pure and his motivations and intentions are such that I share. I love NASA, all those things. I just don't go about it the same way that he does. So Dan Goldin and I developed this relationship. Why I survived as the only center director through his term I really don't know, I really don't know. You know, [there are] people who have postulated that it was politics, [but I don't think that was the entire case.] Other [people] have departed who had political connections. I just don't know. But Dan asked me twice to go away [from Stennis] and do a job, and I said "yes" both times. And as I say, while he is sometimes very tough to work with and for, I found him totally dedicated to the betterment of NASA. Sometimes it didn't work out that way, but I was committed to helping him in any way I could. Consequently, he helped me, he helped Stennis. So the reason I didn't leave when I was fifty-five years old is [that] Dan Goldin committed to help Stennis, and he lined up with Trent Lott in that regard. And while it only required modest [investments], the results are [here at Stennis]. [Stennis] had, when [Goldin] came on board, three test stands and four test positions. Now we have seven test stands and twelve test positions. And we [previously] had basically two propellant types that we [used in] test. Now we [use] a variety of propellants. We have become a national, an international rocket test center under Dan Goldin's leadership and I stayed here to help make that happen. It's just as simple as that. Dan Goldin set out and committed to a vision and he pounded us all the way in terms of having to justify it. The only thing I never could really get much help out of him was on people, I could never get him to give me a lot of people.

Launius: Nobody could. (laughter)

Estess: He felt like that giving us a lot of people would destroy the character of Stennis. He liked the fact that we were lean and had to struggle. But he did give us facility money and he gave us operations money [but, most important] he gave us [a strong] role and mission. He made us [NASA's rocket] test center and [charged us with leading all NASA's rocket test work]. We've tried to live up to that. I don't think we ever quite attained his vision [so far]. We didn't really have enough people to quite attain his vision, but we're still working on that. So your question was, what was my objective when I took over center director? I did not realize my objective until the last five years. Let's put it in broader terms. When Werner von Braun decided he wanted to build this place, he wanted a national center for testing. It never was that until five years ago.

Launius: OK.

Estess: It never was that. Marshall was the [development center and, as such, controlled the testing also]. But about six years, five or six years ago, [Stennis] was made lead center for propulsion testing and we were given facility money. Then just three years ago we were given [test operation responsibility for the shuttle engine]. You go now and look in the NASA budget, go look in the NASA budget, and you find [the] rocket test, line item. Never in the history of NASA has that been the case. You go look for testing. If you want to go to NASA and talk about rocket tests, NASA says, "Go down and see Stennis." I challenge you to go ask the Air Force, "Who do you see about tests?" Go ask the Navy. They can't answer that because it's all spread out. NASA's focused its test [responsibility] down here, it's invested in [facilities and people, and that happened under] Dan Goldin

[with the help of Senators] Trent Lott and Thad Cochran. And, by the way, now we've got a new administrator who has been here twice in his short tenure, and it's clear to me that he is very, very pleased with what he sees and very, very committed to Stennis being the propulsion [test center]. I see Sean O'Keefe [with] a total commitment to good business and a commitment to carrying on and enhancing what we have already got under way here.

Launius: OK. That's great. The 1990s were pretty tough for NASA. As background—and you know this already—the NASA budget virtually every year went down a few, you know, a few points. It meant that the agency had to look at itself pretty hard and restructure. Mr. Goldin, I think, without any question was brought in as a person who was to be viewed and was intended by the president to be a change agent. How did Stennis fit into this mix? And from a larger perspective, how do you view all those activities related to NASA during the decade?

Estess: Well, the decade was tough and it's still tough. We've been flat for—if you put our budget horizon out in front of us and we live to it, we're going to have about fifteen years of downsizing. We're down 35, some say 40 percent over what we were. When I went to headquarters to work for [Dick Truly and] I was there the first day, Dan—the first Monday morning he showed up in the front office. He came in the first morning and met [us] and gave me the job that first week to carry him everywhere the administrator [routinely] goes during the week, tell him what was going to happen, what he should do, and be with him that first week. I did that. So I worked with him the first week. But when he showed up we had about twenty-four thousand employees. We had about a fourteen billion dollar budget. And we had roughly the same portfolio [of] programs that we [have] now. When he left we had about a fourteen-five budget eight years later. We had eighteen thousand seven hundred employees. And we had a space station being built, planetary program very active, earth science program very active, aeronautics program being rebuilt. So you have to say that we, although we took a huge budget cut, we were doing a heck of a lot more with a substantial amount less at the end of Goldin's term. Were we stronger? I don't know. I'll tell you the weakness—I'll tell you what we did give up, we gave up experienced managers and decision-making capability. We did not do a good job during that decade of developing managers for the future.

Launius: Um-hm.

Estess: Sean O'Keefe does not have as good a hand dealt to him as Dan Goldin had. Sean O'Keefe has got a tougher time in putting together programs than Dan had. Dan had a [more experienced group] of people and capability handed to him that does Sean. Does that mean that Dan did bad? I don't know. It depends on what ultimately happens. Dan Goldin had a mandate, or either he created a mandate, to downsize the agency. I don't know. Did anybody, has anybody ever recorded for you the train ride scenario that he gave us the second Saturday that—I believe it was the first or second Saturday he was on board.

Launius: I haven't heard it. Please tell us.

Estess: He decided that the first two or three Saturdays that he was on board that all the center directors would come to town and AA's [associate administrators] would all have meetings. And so the first one was held in headquarters building. The second one was held in the capitol gallery across the street from the old—you remember that building?

Launius: Um-hm, oh yeah.

Estess: [The first Saturday morning meeting, we were all there], all the folks that came out of Truly's leadership [team]. And he had under his arm a stack of view graphs that were TRW proprietary, that he had borrowed with TRW's permission. And so he started off the day by giving us a presentation on management, and primarily TQM, Total Quality Management. You remember we went through that. And he wound up that session by telling us that he was going to take us all on a [trip], this was going to be a train ride. Now he used a train metaphor as opposed to a space or plane. And he said that riding on this train was going to be a harrowing experience for many of us. That we were going to go up steep grades and around sharp curves, but on the way we would see beautiful scenery and we would get to a wonderful destination. And it would not be his intent to throw people off that train, but some of us were going to be so disturbed by the trip that we were going to jump off the train voluntarily.

Launius: OK. (laughter)

Estess: And so, Roger, within weeks people started jumping off the train. That was true. The second Saturday, we met over in the capitol galleries and we were going around the table. And he got around to this roles and missions subject that he had been briefed on. And he said, "OK, I want to understand what's been done here over this last year." And that came out of the Augustine report, if you remember.

Launius: Right.

Estess: And J.R. [Thompson, former deputy administrator] had written a report and Truly had issued a decision document on the end of December of '91, and so he wanted to finish that up. And so at the end of the meeting when he was going through actions, he brought that up and he said, "Who's going to do that for me?" And all the center directors pointed to poor old Estess who had been working with Truly on that and so I got that action. And so for the next [several] months, I worked roles and missions with Mr. Goldin. And he by-and-large embraced most all the actions that had been previously decided. He wanted them done quicker than we thought we could do them. We did bring to him, though quietly, ideas that [have] never surfaced, that historically ought to be recorded.

Launius: OK.

Estess: I'm even reluctant to say which centers, but we recommended closure of centers his first year. And we identified which centers and the rationale for it, and he really embraced the idea. *But*, let me record this for historical purposes. We had *a* major center that we thought could be closed and we had a scenario on how to do it. This is a team of people that he had put together recommended this to him.

Launius: This was a team from across the agency, not just a bunch of headquarters guys.

Estess: That's right. No, this was a team from across the agency and most all of them, well all but two, were field center people.

Launius: OK.

Estess: And [we thought a] center could be closed. We recommended this very quietly and to this day, it's never seen the light of day. It's been very closely held. And he thoughtfully [said] in a very small group said, "That's probably what should be done. I'd better not do that. Bring this idea back to me a year [from now]." Now let me fast forward to a year later. We had a vote in the House [of Representatives] where the space station survived by one vote.

Launius: By one vote, yeah.

Estess: If he had closed that center, the space station would not exist today. We'd have lost that state, we'd have lost that delegation, and we'd have lost the space station. That shows you the insight that the guy had for what was going on. *I* being in that position probably would have taken on closing, that we should have closed some. Anyway, he knew that we had a margin there, and a year later he depended on that state for some votes to keep the space station alive.

Launius: Um-hm.

Estess: A very close call that he made and he made it correctly. It'll never be—I'm glad to put it on tape for historical purposes—that's a fact, that he made the right decision there. And so we worked on roles and missions the whole year. We also went to him and told him that he ought to close Reston [Communications (?)]. There were NASA notables, whose names I could put on tape, who convinced him that that was not the thing to do. I know exactly who that was, the two guys who [lobbied] him not to do that. Two years later he did it though. He got out of Reston, which was the right thing to do.

Launius: Right. At the time that they were going to, when they recommended closing Reston, what did they suggest? I mean, space station wasn't going to go away. What did they want to do? Did they want to send it like they did a couple of years later, or did they want to bring it to headquarters?

Estess: No, send it back to the field centers.

Launius: OK. All right.

Estess: Send it back to the field centers.

Launius: All right.

Estess: And where we thought it could best be built. And so we, our team recommended that we close Reston. And as I say, he didn't do it, but he did it two years later.

Launius: Um-hm.

Estess: Two NASA notables who talked him out of it. And—but it was the right thing to do and, ultimately, turned out to be a success. And so, in those early days it was tough as we were trying to figure out what to do. Now, Roger, from a historian's perspective, you and others, over time, will have to figure out whether or not our—and I put myself in that category—leadership during the decade of the '90s was good or bad. NASA did not fare very well budgetwise, peoplewise, but we fared very well in terms of productivity. We produced results. So the output per dollar was pretty high. But how good a shape did we leave the agency in to go into the new century under new leadership of Mr. O'Keefe is yet to be seen. Let me give you a perspective from JSC, having been there for the last year or so. The space station—every flight, as I did last time, I sat, and as I see those guys drive up to that station and everything—knock on wood, if you'd permit me (speaker knocks on table), it's *amazing* how well that station is going together.

Launius: Right.

Estess: And, technically, we've had some problems, but they've been worked out. And the workload is *grueling* at JSC and the space station and the space shuttle community, and the space station has been under terrible pressure. OMB [Office of Management and Budget] with the Congress, White House, Washington, the press. The shuttle, while it hadn't been under public scrutiny, has been under budget pressure. But the shuttle is operating very well. The space station is going together like clockwork. It's coming along unbelievably well. So NASA's ability to—and this is a complex undertaking building this space station and operating it.

Launius: The most complex ever tried.

Estess: It's incredible.

Launius: The *most.*

Estess: It's incredible. And I don't believe that we're getting the word out at how complex it is. And, of course, the country is busy looking at other problems, but rightfully so—the war and so forth. But it is incredible what NASA [is] doing. Now having said that, do we have less capability than we did ten years ago? You know, one could say the ability to build hardware, put it into space and operate it still exists. We've got it. Could we build [a new space craft like the] orbiter? I doubt it, but we could—do we know [how] to approach that problem? Yes. Is NASA decimated beyond the ability to build big projects like station? No. Is it capable today? Does it have all the tools it needs? No. We could put together a team to do just about anything the country wanted to do. We still have, in my view, the basic understanding of how to go about that. But the space station is just a phenomenal technical success so far. Now we've got to make it an operational success yet, a scientific success yet. And Mr. O'Keefe has made that very clear, that that's one of our principal objectives, and he's right. But I tell you, if you look around at what's going on on orbit, we've had three people on orbit now for two years.

Launius: Right.

Estess: And it's pretty amazing. We just sort of take it for granted, but this is not something to be taken for [granted]. It takes a lot of work to make it happen so smoothly. Tommy Holloway, who's leaving the end of this week, deserves a lot of credit for having managed that program in the last few years as successfully as we have. Many others also. So NASA is—you started this line of questioning by talking about the '90s. We downsized, some might say rightsized. Let me tell you what we did not do. Institutionally we were too big. We closed some buildings, we closed some test stands, we closed some laboratories, we got rid of some old buildings we weren't using anyhow, and we claimed a lot of credit for that. But we got too many centers.

Launius: Um-hm.

Estess: And if Dan Goldin, as tough as he is, can't close a center, and the reason he can't do it is because of politics.

Launius: Right.

Estess: For reasons I've already stated.

Launius: Right.

Estess: Then you might as well throw in the towel. It will take some sort of BRAC [Base Realignment and Closure, process used by DOD, the Department of Defense] committee [to do that].

Launius: That's the only way the DOD could do it and they have hundreds of places.

Estess: Right.

Launius: You've got ten [centers].

Estess: And so we're too big, so therefore it takes a lot of money—

Launius: Just for infrastructure.

Estess: —just to keep us open, open the doors every day.

Launius: Um-hm.

Estess: Now I'm proud to say that little old Stennis is not in that category. There are two small centers that grew during Goldin's tenure, Stennis and Dryden [Flight Research Center]. All the rest of the centers were downsized.

Launius: Right.

Estess: But Dryden and Stennis grew during those years.

Launius: Would you think that that is because you have, in both cases, very unique capabilities that can't be duplicated anywhere else and a knowledge-base that allows you to carry those out?

Estess: That's part of it. But part of it was that Mr. Goldin and other senior managers at headquarters were sympathetic [with] what we had already faced and were doing what these—I go to meetings today, in the last months, where other centers' representatives come in and have some wonderful new idea about outsourcing or consolidation and so forth and we sort of snicker because we [have done] that. We did that eight, ten years ago.

Launius: Yeah.

Estess: Because, not because we were so smart [but] because we didn't have any choice.

Launius: Yeah.

Estess: We were trying to survive. We weren't smart, we were just trying to survive and so we got it done the cheapest way we [could]. Other centers are now facing it because they have no choice. And they're finding revelations, like buying things on the outside that they've done themselves all these years, and they find they can buy some of it cheaper. We've been buying it all our whole lives because that's the way we were set up. And so I'm very proud of our Stennis team. Now on the other hand, Stennis made the case last Friday to Mr. O'Keefe, "Stennis is too small. We're trying to do what we've been asked to do with too few people. And you shouldn't put a thousand people down here to help us but you should put a hundred. We've got about three hundred people, we really need about four hundred."

Launius: OK.

Estess: Dryden has six hundred civil servants and they don't even operate the base, the [U.S.] Air Force does. You've got almost three hundred people at Wallops [Flight Facility]. That's not even a center.

Launius: Right.

Estess: And so Stennis is—how'd we get this small? We started this small. When we were emancipated from Marshall in 1974, we were called the NASA Space Technology Laboratory and left with the number of people that we [originally] had, [seventy people]. And there was no recognition that a lot of people at Marshall had made their living off of supporting what was going on down here. We got none of those people. And so, for the first few years, we had to just get by. And we got personnel support from KSC [Kennedy Space Center] and help from wherever we could, and gradually we got a few people here and there. Bill Lenoir, [associate administrator for space flight], gave us thirty people one time, which is a great influx of young engineers. Dan Goldin gave us a few people. Historically, one of the people who, over time, really did the most institutionally to help Stennis and at the same time held us to a very high standard and pounded us, pounded us to make sure we were doing it right was Richard 'Dick' Wisnewski.

Launius: Hmm.

Estess: Wisnewski understood better than anybody else in headquarters what this was all about. And through his two separate tenures in headquarters, Wisnewski was probably the strongest and most effective supporter of Stennis over time. AA's like Dick Truly and Bill Lenoir and Joe Rothenberg [supported us] to a good extent, but the power behind the analysis and understanding was Dick Wisnewski. The real support for Stennis over the years came from Wisnewski. I'll always be grateful to him.

Launius: OK. Let's see. Myron's got some questions here I'm going to ask you. I'll just read this: "In August of 1998 Stennis re-wrote history with all test stands full for the first time. Could you tell us a little about the strategy behind this evolution from three test stands—and you mentioned that earlier—to the seven that you've got today and how that took place." Let's see. "Not only NASA but for private sector aerospace companies and the DOD."

Estess: [Yes.] Well, you know, we're at sort of, we're at the end of the food chain. We don't build any rocket hardware, we are testers. And we depend on the mood of the country and the investments made by others in building rocket hardware for us to have anything to test. What we saw going on in the '90s—and if you go check it, you'll remember that it became a realization in the country and [in] the Congress also—that we had not built any new rockets for twenty-five or thirty years.

Launius: Right.

Estess: We have an improved space shuttle main engine, but [the] space shuttle main engine was designed in the '60s and it's improved considerably. We fired the first space shuttle main engine here in 1975, in June of 1975. And so that's old technology and we haven't built new rockets. Now recently the DOD is attempting to do that with the evolved expendable launch vehicle [EELV], but we attempted it with the X-33.

Launius: Um-hm.

Estess: We shut [the X-33] down. We attempted it with X-34. We shut it down. So our record, our—in the greater sense, the country's record in the last decade, decade and a half, with regard to building new rockets that get you into space, is pretty dismal. At the same time, the Russians have a huge store of rockets. Not many of them are new but they are very reliable. But the Europeans have advanced in the Ariane class. They've now got the Ariane 5 that operates. The Japanese have built launch vehicles including hydrogen engines, [they have a new hydrogen engine]. And the Chinese have been actively building [a human space program]. So our international competitors are building new rockets. In the 1990s a realization in this country [emerged] that we needed to invest in access to space. And it became, if you remember, Dan Goldin's number three priority behind the space station, [space] shuttle, [with] space shuttle being first. And so why did he do that? Again, it was the belief that in the next decade, which we're now in, whoever controls access to space at the cheapest dollar is going to have an international competitive advantage.

Launius: That's right.

Estess: So it made sense then to invest in propulsion. That view got to be so pervasive in the mid-'90s that NASA, the DOD, began to invest in propulsion [and] launch vehicle development. But also for the first time major new [companies] who were going to [invest in developing new access to space].

Launius: Right. Rotary rockets [and others].

Estess: [Many ex-NASA people got involved with these companies.] George Miller and Dick Coors [are] running Kistler [Aerospace Corporation].

Launius: Running Kistler?

Estess: And so everybody got involved in trying to get to space cheaper, more reliable, and so forth. We saw that coming. More importantly, Dan Goldin saw it coming. He decided that we needed to invest in test capability at one place. So he made the decision that we would downsize the infrastructure at Marshall and other places, and we would consolidate it at Stennis. Therefore, we went from three test positions to twelve test positions. And, by the way, we have another major facility that's approved. [We are] just now starting construction for the [new technology], rocket, the combined [rocket] cycle test facility. And that will wind up being a major facility over time. So, in the meantime, there was this recognition by the country that we needed to invest in access to space. All right, fast-forward to 2002. What's happened? Kistler's in trouble. Rocketdyne's for sale. United Technologies has Pratt & Whitney for sale. Aerojet's been sold. The Boeing Company's losing money on rockets. Lockheed's losing money on rockets. The rocket business is not [a] good business to be in [from a profit standpoint].

Launius: That's right. And commercial launches are down.

Estess: Commercial launches, the requirement is down. It's not a good business. So what happened in the '90s? We built these facilities and for the first time we had them all full with devices being developed by all these companies and government entities. Now we have peaked over, rolled over the hill, and we don't have that kind of business level [to look forward to]. We are now running more tests this year than we [conducted] in the last four years and more test *seconds* at Stennis than in four years. But it's for fewer customers. And so the emphasis seems to be now [on] improving the products that exist as opposed to developing new products. As I said, we are really running a lot of tests on existing hardware, but these upstart new companies are in trouble. The latest rocket engine [being] built in this country is RS-68, built largely with Boeing money by Rocketdyne. They built that engine at a small percentage of the cost that we put in the space shuttle main engine.

Launius: Right.

Estess: So it was quite an achievement. It's a new hydrogen-fueled engine. But the emphasis now is off. You go put your ear to the ground [now and] you don't hear that talk about access to space as you did in the '90s. Stay tuned, it will cycle back.

Launius: I'm sure of that.

Estess: It will cycle back, but right now we're a little bit in the down cycle in terms of rocket building and rocket test.

Launius: Well, it's, quite frankly, it's very troubling to me that—I mean, this is the—the military likes to use the term "the long pole in the tent."

Estess: Yes.

Launius: And that's exactly what access to space is if you want to fly in space.

Estess: Right.

Launius: And I'm saddened by the fact that—I had high hopes for X-33 and X-34. And maybe we'll move forward with something, I certainly hope we do.

Estess: Well, I regret that we had to pull, had to stop X-34 and the X-38, for instance. We're now in the process of stopping it, the X-38. And so our record in the last few years of starting new vehicles and propulsion systems and then shutting them down is not good. We spent multi-billion dollars and we don't have any hardware to show for it.

Launius: Yeah.

Estess: So any criticism that comes our way in that regard is somewhat justified. Now we've learned a lot in the process. The question is, can we take that what we've learned and apply it somewhere? And if we don't have a chance to apply it, like the space launch initiative, then it will have been for naught. The space launch initiative, some are worried about it, including me, *but* it's the only game in town. Were it not for SLI, the launch vehicle development and the propulsion development business would really be in trouble. What's keeping some of our—let's take Rocketdyne, our premier rocket engine builder. We build about three SSME's every five years, so every year you get about 80 percent of an SSME. The RS-68 was going to build, be built at the rate of forty per year. Now they're looking at about seven per year with the reduced requirement.

Launius: So there's almost no production line.

Estess: There is no production line. The Lockheed version of that is using a Russian engine. Rocketdyne's building a few, a fair number of engines, small cookie cutter-type engines for defense purposes. But the big kind of sophisticated engines needed for heavy payloads and for people, there's no requirement for them. Therefore how do you keep a company alive and how do you keep the engineering work force and the other people work force in place to make it happen? Therefore, you're seeing this: you're going to see some consolidation of engine companies and vehicle development companies. And then after

that consolidation and pain occurs, I think that it's going to be necessary for the government to wade in, and we're going to have to buy something to keep them afloat.

Launius: Right.

Estess: Give you an example. We buy—we've got an aircraft carrier being built all the time. The latest one is, what, the Ronald Reagan?

Launius: Um-hm.

Estess: And the John Stennis has just been built. We build one [at a time]. There's only one place in the country you can build a big aircraft carrier. There's only one place you can build an electric boat. There's only two places you can build big airplanes. If we don't buy them, then this country doesn't have the ability to build them.

Launius: That's right.

(The interview continues on tape one, side two.)

Estess: [We need to maintain the capability to build large and complex ships for] defense purpose[s], for maintaining what we do.

Launius: Right.

Estess: If you want to have the capability. Rockets are hard to build, [we must build rockets].
Launius: Um-hm.

Estess: They're fairly easy to test, although it requires a fair amount of discipline. But they're [very] hard to build. Your question again was about having our test stands full. They're not quite full right now, but the test stands that are, are very busy.

Launius: Well, that's actually a good thing. I was going to tell you an anecdote just for your own information. I ran across a National Security Council memorandum from June of 1957. And President Eisenhower at that time had asked the DOD—and everything was DOD at that point—"How much have we spent building rockets?" And they came back to him and said, "Since you became President in January of 1953, we have spent 11.8 billion dollars"—back in 1950s dollars—"developing this ballistic missile capability." And that—

Estess: A big number.

Launius: That's a big number in those days. I mean, it's a lot now, but it's a lot more then.

Estess: Sure.

Launius: And then they said, "And Mr. President, we anticipate that by the time the second generation launchers come on line about 1963, ten years into the program, we will

spend an additional twenty-five billion dollars for a grand total of thirty-six point eight billion over a decade." That is the investment that got us Atlas, Titan, Delta, and the solids with Polaris and Minute Man, which have been incrementally improved since that time but were still flying. The punch line to this, which I've told some of the people at headquarters, which is that there's going to have to be a sizable government investment if you want to have a great technological leap forward.

Estess: Right.

Launius: It doesn't have to be 36.8 billion dollars, I don't think, but there's going to have to be some investment.

Estess: Right now we're—the SLI [Space Launch Initiative] is about 4.5 billion over five years. Nice program. *But* as you said, it's going to have to be substantial or we're going to be flying on these old rockets for a long time.

Launius: That's right.

Estess: I don't see, quite frankly, the leadership anywhere that's interested in it. I mean, we've got to fight a war, we need drugs for the elderly, we need housing for the homeless, [and so on].
Launius: It's all a question of priorities.

Estess: Yes, it's just a question of priorities.

Launius: And those were defense priorities at that point.

Estess: Right.

Launius: I mean, they were not NASA exploration priorities.

Estess: Right. And so as long as—you know, the worst thing that ever happened to the [American] space business was us to make friends with the Russians [because it took away competition].

Launius: (laughter)

Estess: Now let me postulate the following. As we speak, I happen to know from my days over [at JSC], the Chinese [are now] training astronauts and dreaming about putting people in space and even going back to the moon.

Launius: Right.

Estess: Now, the American people [do] not know [this].

Launius: Right.

Estess: Have no idea that that's going on. One day they'll wake up and a person goes in space from China or heads off to the moon, what's the public reaction going to be? Two things could happen. One is they can say, "Yawn, yawn, we've been there, done that. Let them play around."

Launius: But they won't.

Estess: But the other thing they're going to say, "My God, what are they doing? They're catching up with us. There must be some reason to go into space." And maybe it'll give us a shot in the arm. You could have multiple reactions. I wonder why it is that the Chinese find it interesting to go into space. I can tell you from my time at JSC, as I talked with internationals, we talk about the need for scientific results out of our space station program and we have matured to the point where that's what we need. We've been there, done that on [creating] American heroes. But I'm telling you, the rest of the world, what they're interested in now is having their person fly in space so they can come back and have a parade and be enthusiastic about it.

Launius: Right.

Estess: They're still in that phase. And so our international partners on space station, the Chinese who are not involved in space station, they're interested in having heroes who've flown in space at this point in time. As I say, we've gotten over that in our program. I was feeling low one weekend when I came home from JSC, having been beaten up by the system about the space station and committees that were reviewing us. And my wife had sensed that on the phone and she imported the grandkids to pump me up. And so my grandsons and I were out in the big room and we were—they were playing their games and I was talking [to them]. And I stopped and I said to my now-thirteen-year-old grandson, I said, "Drew, what do you think, son, if I told you that we're going to quit flying in space and that we're going to shut down the human space flight program?" And he looked up and looked out the big window and I could see his little brain working and he was asking himself, "Is this a trick question?" [Sometime I ask] him crazy questions like, "How far can you walk into the woods," and things like that.

Launius: Yeah.

Estess: And so he was analyzing it and he said, "That'd be bad, Papa, if we quit flying in space." And I said, "Why? We got lots of problems down here on earth and we don't need to spend that money." And he said he was amazed. He said, "Papa, in the olden days they went west in wagons, and aren't we trying to go out into space to find out what's out there and how to live out there?" I was enthused by that answer.

Launius: Um-hm.

Estess: Then I started reflecting on that after he went home and I flew back to Houston. And I said to myself, "Estess, you and your contemporaries only have responsibility and authority for some twenty, maybe thirty, sometimes forty years of life span for which you—and really have any real power probably ten, fifteen years for any one particular individual generation. The bottom line is this: I can decide not to build a rocket this year

with my colleagues in the United States and I can decide not to fly into space my colleagues, but I sure as hell can't decide for Drew, because I'm going to be sitting on the old folks' home and he's going—if [we] get out of this business now, he [and his generation] will declare me and my generation idiot[s] and he and his generation will re-start it. So we, in our own grand glory and self-[ev]grandizement [with] our power, we have the responsibility and authority to decide now, but we sure don't have the authority to decide the course [for future generations]." So when I look at flying in space over the course of human history, it's going to happen.

Launius: Um-hm.

Estess: It's going to be more routine. And so I ask groups as I speak to them, "A hundred years from now, will we go out and drive a machine off of the end of some runway or track or something, fly into space, and go do something, somewhere routinely?" "Sure," they say. I say, "Well, what about fifty years from now?" "Probably." If you take what we did in the last fifty years although we haven't done a hell of a lot [to show] in the last forty years. And I said, "OK, if the answer to that is 'yes,' then why is it that we're debating on whether or not to invest any money on fundamental technology now so that those who come after us can stand on our shoulders [with] what we've developed?"

Launius: Right.

Estess: Why are we debating about whether or not we're going to do this? If the answer is a hundred years from now people are going to be doing it, then we have an inherent responsibility to take some percentage of our resources and invest it in capability [so] that those who come after us can stand on our shoulders, just as we stand on the shoulders of those who came before us. It's a logical progression. So, therefore, I have little patience with debating about whether or not we're going to do human space flight *or* develop new propulsion devices. We ought to be putting these building stones in place, and surely they ought to be done correctly. And we [should] be held accountable and we ought to be held to high standards. But, nevertheless, we have an inherent responsibility. We inherited capability. We're using that capability. We have a responsibility to hand off better capability than we inherited. I'm not sure that we are fully living up to that commitment. Drew and his contemporaries will look back when he's forty, forty-five years old and say, "What did Papa and his crowd hand us? Did we get what we got from von Braun or did they improve it any during their generation?" I think we have a responsibility to improve it some and hand them a better deal than we got from von Braun and his crowd. And so I see this as a course of human history, kind of endeavor that deserves a percentage, 1 to—I like to see 4 percent like Apollo—but it deserves it. I would be satisfied with 1 percent of gross domestic product.

Launius: Um-hm.

Estess: What is it now? Six-tenths percent, something like that. I would like to see 1 percent dedicated to fundamental technology and capability [so] that some day [it] will allow people to routinely fly into space at a reasonable price. Somebody besides Mr. Tito and Mr. Shuttleworth who can afford twenty million dollars to buy a ticket. It's a great enterprise.

Launius: Yes, it is.

Estess: It's a wonderful enterprise. It requires vision, commitment, and it requires long-term dedication. It is not a flash in the pan. If you get in this business and you want results next year, you're in the wrong business.
Launius: Um-hm.

Estess: It requires long-term commitment. It takes a long time to build people who know how to do this business.

Launius: Yeah. That's one of the real challenges, of course.

Estess: Yes.

Launius: The attention span of the American citizenry seems to be relatively short.

Estess: Very short.

Launius: The political system, the attention span is relatively short. It extends essentially to the next election and that makes it a difficult challenge. Negotiating those is, well, is the work that you've been doing and lots of other people who have been in NASA for a long period of time [have been doing], I guess. Let's see, let me shift gears a little bit, unless you have some other things you wanted to add on that.

Estess: No, go ahead.

Launius: Because I think that was great. Myron's got another question here and we should definitely talk about this. The significance—1998 there was an agreement between Stennis and Boeing to lease the B-1 test stand for twenty years. How would you characterize these decisions? Well, I guess, first off, what was the process that you went through to go about doing this, and how would you characterize this kind of endeavor?

Estess: Well, it occurred to me early on in the '90s that we were going to have to pursue other lines of business in order to stay in business. And the whole business of rocket testing was, it became clear to me, going to be done by the private sector. And I got enthused about that when the private companies began to be formed—and Kistler and those we've already talked about. We have tremendous infrastructure of capability put in place by the American taxpayer. More infrastructure than we needed for government-funded programs. So it became pretty obvious to me that we ought to make this available to industry who had their own [programmatic] reasons. And so we came up, here at Stennis, with the idea to commercialize our test facilities, if you will, outsource them, make them available. And I don't know, you know, it never was any great big evaluation by the agency. We just went up to headquarters and said, "Here's something we ought to do." And they sort of said, "You're on your own. Small Stennis is up here with this idea, OK." And the lawyers set about—well, it took the lawyers six months to craft an agreement between Boeing and us. Liability was a big issue. And so we decided to rent Boeing a major facility that had been used for two government programs. It had been used

for Apollo and [the] shuttle, but it had no future business that we could see. So we decided to rent that test position to Boeing for the life of a program for commercial [dollars]. And we negotiated a price that they would pay us annually for that. And that price included not only the daily operation cost but [also] it included maintenance costs. And it also included investment in maintaining capability so that at the end of the time the facilities would still be in as good a shape as they were when we leased them out. So we came up with this commercial idea and NASA said basically, "Hey, sounds good to us." So we went [ahead] and did that. But, concurrently with that, we set about—about five years ago I set myself a personal goal. I said what I would like to see happen as a final achievement before I leave here: I'd like to see some company build on Stennis a major capability with their own money that was not under a contract to the federal government.

Launius: Um-hm.

Estess: I believe it can be done because there's no reason that government and industry can't get together. Well, we got almost that [with what's] to be dedicated on August the fifth. We have a Lockheed manufacturing plant [and a calibration] laboratory that's built on government property with Lockheed money and State of Mississippi money. Now admittedly this is not quite pure in that most of Lockheed's money comes from the federal government through contracts, but it's not a contract to build this factory. They're building this factory because they're going to sell [capability] to a corporation, and the corporation is going to sell to everybody including the federal government. But we're about to open a major factory that's built on government land with private and State money. And I've had other centers tell me, "It can't be done." When I was at JSC, I had a lawyer to tell me, "I don't think you can do that." I said, "Really? It's being done over at Stennis." "Oh." And so we're again—so the idea to commercialize our test stands is something that we came up with again as a matter of our business. We were encouraged along these lines. Dan Goldin always encouraged us. He thought that these ideas were great, and he was willing for us to run with them until we hit some wall somewhere. And, admittedly, we thought usually the wall would be legal. And Ed Frankel, who is now retired, I'll have to say, was a leader in trying to help us sort through the legalities of how to do this. And he *personally* several times got involved to try to unsnarl the lawyers. [He did so] in the Boeing deal, for instance, that you asked specific about.

Launius: Um-hm.

Estess: He finally got—he finally personally had conversations with Boeing's corporate lawyer, top corporate lawyer, who he knew personally. And so we got down to the final nits and gnats, and it boiled up to Ed and the top corporate lawyer talked and—

Launius: And sorted out.

Estess: —and sorted out the last thing. And so all the way up through Ed Frankel we got this done. And we rented out a facility that belonged to the federal government to the State. Now this is not unheard of in [NASA]. Other parts of the government do this, but it's not something that is common in NASA.

Launius: Right.

Estess: Other parts of the government [have done] this and [have] led the way but it is very uncommon in NASA. And now other NASA centers are, in fact, looking at [it]. KSC has been very aggressive in following up on it.

Launius: Right, yeah, they have.

Estess: [Yes!]

Launius: Ames as well.

Estess: Ames as well. Ames is [doing] very well.

Launius: Did you find that when you were doing—I mean, obviously, the lawyers have to sort this out and there's lots of issues that have to be worked. Did you find statutory issues where you had to go and get legislation changed?

Estess: We, [NASA and] the lawyers, needed congressional consent.

Launius: OK.

Estess: And so we did go in, in a couple of cases, and have language put in the authorization bill. And we had a sentence inserted here or two in our bill. And that's, if done right it's fairly routine to do. And so we went to the congressional folks and had them put in language. Sometimes Ed thought we needed it and sometimes he didn't. Ed was of the belief that the space act is so broad in its scope that you can do almost anything that makes sense and so he really tried to do it without language. But we did on a time or two put language in authorization, yes.

Launius: Did you find that the congressional delegations are supportive of these sorts of things?

Estess: Absolutely.

Launius: Yeah.

Estess: Absolutely. It was a no-brainer. They are absolutely supportive. Now they don't want to give up control.

Launius: Sure.

Estess: But they don't mind dual utilization, particularly Stennis. The congressmen here as well as the senators, but the congressmen—Gene Taylor sees us encumbering a hundred and forty thousand acres of land. He likes it from the standpoint of an environmental zone. He dislikes it from the standpoint of not being able to use it for other things. So the fact that we were dual, triple using it is very popular politically. To just sit on it out here and spend money on maintaining it and not using it is not very smart and it's not popular politically. By the way, we do that all over NASA.

Launius: Um-hm.

Estess: We maintain facilities that we don't have a job for and probably never will have.

Launius: Right.

Estess: But here we decided—we saw no need for these facilities in the long term and so we rented them out. We did put a catch clause in there, though, if the country needed them, we could throw Boeing out.

Launius: OK.

Estess: And Boeing understood that and signed up to that. So we do have—if the country needs the facility back, we can give them a year's notice and throw them out.

Launius: OK, all right.

Estess: So we didn't give the facility away. We rented it, we leased the facility.

Launius: Yeah, I think this was the model for some of the stuff that we did at Langley with some of their wind tunnels that—

Estess: Yes. And Ken Human, our [chief] attorney, Ken worked—he loves new things and he worked on this thing, as I say, for over six months.

Webb: And we did an oral history interview this week with Ken and got some of that on tape.

Estess: You did? Did he talk about that?

Webb: [Yes], of course.

Estess: And he worked hard to get [it] done.
Webb: He should be proud of it.

Estess: [Yes], he should.

Launius: OK. We'll shift gears for a moment. Myron's got a note here that you told the Partners for Stennis community organization that the future of Stennis has never been brighter. And—

Webb: A few years ago.

Launius: This was a few years ago.

Estess: Right. I think it's still true.

Launius: OK, that was what I was going to ask you. Is that still true and how so?

Estess: [Yes], I think it's still true.

Webb: And how's that come to fruition?

Estess: Well, Stennis, in the context of a multi-agency federal laboratory *today*, in June of 2002, as I sit here and talk to you, there are twelve buildings and major facilities under construction. I have money in my hands for a thirteenth building that's in design. We have twelve—listen to that—we have *twelve* buildings under construction. You go tell me one other NASA center that can say that.

Launius: Yeah, right. OK.

Estess: Now are they NASA buildings? Not all of them. There are three NASA facilities. There are two that's funded by the State of Mississippi, seven funded by the defense department, and on and on and on. And the Navy SEAL base will [also] be dedicated on August 5. It consists of six or seven buildings. There is a high potential that there are going to be additional consolidation to that SEAL base from other parts of the country. I've already been in discussions with admirals and one general about [that] potential. Political folks are working [it]. And it really comes down to, can they get facilities here to [accommodate them]. We're [also] going to dedicate a special warfare center that's just been built across the street [from] the Navy. The Navy is continuing to invest in the supercomputer. As we speak [today], the largest supercomputer in the world is at Stennis Space Center.

Launius: Really?

Estess: Today.
Webb: Oh, today it is the largest, OK.

Estess: The largest supercomputer. And now this racks back and forth because everybody's always adding, but it's been in the top ten for the last several years. But you have this huge supercomputer across the street that the Navy owns. And so the investment by the Navy in supercomputer capability, the SEAL base, the Center for Excellence in Oceanography. We have [a] two-billion-dollar investment in rocket test facilities. There are only about seven hundred people [hands-on] involved in that, but the facility investment is huge. We have a new factory being opened up to support Lockheed. It's Lockheed's factory, as I've already said.

Launius: Um-hm.

Estess: We are talking with another major entity, about building another factory beside it. It will require additional infrastructure. I've briefed the administrator on this. Again, it's commercial in nature; not NASA-funded, not federally-funded, but commercial in nature. And so there's several ideas that are on the table for continuing expansion of this multi-agency federal/industrial community.

Launius: Um-hm.

Estess: And the financial and management arrangements that we have in place support that. [We] have about four separate centers and four separate operations. I've got Stennis prime that has this reimbursable system where federal agencies help share the cost of the base. I have a separate arrangement with the Boeing Company that builds RS-68s and tests them here, and that's a financial arrangement. I have an arrangement with the Navy SEALs where they do a lot of maintenance and operation of their own yet we do some for them; that's a separate operation. And we have another operation with the Army plant here where they provide most of their own but we support them, medical and security and certain engineering capabilities. So we have, I said four, we have five [arrangements]. And then we have an arrangement with Lockheed where they pay us, reimburse us, for certain costs associated with living here with their plant. So we have a multi-faceted management system, operated by three hundred civil servants and a number of contractors. So this is a substantial and fairly complex federal [and] commercial city with new ideas on the table [for] the future. People from other parts of the country can scoff at it and say, "Ah, it's only there because of politics." It got started because of politics, the multi-agency arrangement, but now it's being perpetuated because it's cheaper to do business [this way].

Launius: Yeah, makes sense.

Estess: The new company that we're dealing with, that's talking about locating here, told me that the loaded cost of a technician where they want to come from is a hundred and twenty thousand dollars. The loaded cost of that same technician to work here is fifty thousand dollars.

Launius: Wow.

Estess: You tell me if that's politics or business.

Launius: Yeah.

Estess: And so I'm telling you that with the right kind of leadership and right kind of pushing here, this place will continue to grow. There's twelve buildings under construction, more on the way.

Launius: How do—I know there's been some difficulties, say at KSC, with some of their jointness. How's the interaction been with the various, all the units working out here? I'm sure there are occasions where they step on each other's toes and that has to be sorted out. But generally speaking, are the arrangements harmonious?

Estess: [Yes], I won't tell you we don't have a rough spot from time to time. We've had periods [when] we went into the doldrums. We've done several things to—I brought a person up on the staff here that has visibility [in] the director's office to work with other agencies to make sure they are happy. [A senior] person, who has experience, that can talk to an admiral, can talk to a captain, and that's really, really helped. We have experienced managers in center operations and in financial management that know how to deal with

them. But there's another underlying reason. We have one little, small NASA program of our own and that's the role in NASA earth science applications.

Launius: Right, right.

Estess: The rest of our being down here is ultimately to support somebody else.

Launius: Um-hm.

Estess: Rocket testing, [earth science], and operate the place. So we don't have the inherent natural arrogance that another big center that is charged with going to space or launching astronauts or whatever, we don't have that. We come to work every day knowing that our role is to support somebody else's mission. It changes your attitude. Therefore, it puts you in the more, it makes you more likely to be able to get through the day by working *with* somebody as opposed to working against them or talking down to them. Now sometimes we have other people who transfer in here from other centers who have to do a little bit of learning. But most of the time it's an easy transition. Your question was, does it have a rough spot every now and then? Sure. Does it require management attention? Sure. Do we bristle at one another and spark in conference rooms? You betcha. And [when] we have a new Navy captain show up, a new Navy admiral show up, and sometimes they say, "My God, is all this legal?" And, you know, we've even had one Navy captain to call the JAG [Judge Advocate General] in [to check it out].

Launius: Really?

Estess: Oh yeah. Called the JAG in to review this whole process. "It can't be legal." And the JAG came in and traced it back to congressional intent and said, "Yeah, it's legal." And so it works and we all make money out of it. It's a great concept. Isn't it ridiculous that we could all get together and decide that we're going to share the cost of mowing grass and maintaining buildings and operating the cafeteria and the base hospital [for] all these various agencies? That's unheard of. We generally have to—in a big city we have to let GSA [General Services Administration] do that. Well, the idea of us getting together and talking to one another horizontally—I'm being a little facetious.

Launius: Yeah, I know.

Estess: —but the idea of us getting together and *sharing* with other federal agencies is a preposterous proposition. *But* [it is] one that [should] happen all the time. We all work for the same taxpayer, and at Stennis here, we make it work. That's not to say that from time to time we don't bristle at each other.

Launius: Right, right. It's also very unusual. And my experience with the DOD was [that] the general feels like he should look out the window and be master of all he surveys.

Estess: Right.

Launius: That's not true here.

Estess: Well, I can walk right out in this hallway and look to the left all the way to the end of the hallway and the door that you see is the admiral's.

Launius: Um-hm.

Estess: And he walks down here and I walk down there. We get along and we work hard to make sure that we keep each other informed. We understand that that's fundamental to it.

Launius: Yeah.

Estess: And next door to my office here is the head of the, the senior NOAA official here. We all, the managers, we work hard to get along. That's what this multi-agency federal laboratory is about. It requires some attention. The first time that you have a management team here from NASA who doesn't understand that or doesn't take that role seriously, it'll come apart.

Launius: Yeah.

Estess: Now I have to say to you that we don't get many "attaboys" from Washington for running this federal base. We get "attaboys" for testing shuttles and for doing earth science work and for running the base cheap. But the fact that the Navy's happy today is, "OK, so what?" If they're unhappy and Washington hears about it, then we get called upon the carpet. But if things are going along smooth, we don't get much attention and many "attaboys" from Washington about running the base. If you're looking for great accolades from your bosses in headquarters, you're not going to get them from running a multi-agency federal laboratory.

Launius: Yeah.

Estess: Now there are certain ones who understand it. They're sort of becoming few and far between now. Wisnewski when he left, that was [about] the last one, [although] Mal Peterson [also] understood [the concept]. Let's see, today, who in Washington is the most aware and most sensitive to the fact that we've got this multi-agency arrangement down here? I can't think of one name that really understands it today. There are a few people down in the trenches that do.

Launius: Yeah.

Estess: But with the going away of Rothenberg and Wisnewski—now the others just [haven't]—it's not that they don't want to, they just [have not] had a chance to get involved. And so that's a little bit of a downer for us from time to time because we've got a lot of people who work hard to keep all this thing on track and intact. But I have to close my eyes everyday and say, "It's the best thing to do for the country. It's the right thing to do. It's an economical way to run a business that we're doing. We're public servants. We're getting a paycheck and we don't have to have a plaque or 'attaboy' every day." And so I'm perfectly content when this thing's running smoothly this week. And I'll see the

admiral in the hallway and he's happy and we send him a bill and he [pays] it. I think that's fine.

Webb: They all affectionately call Roy the "Mayor of the City" here.

Estess: Right.

Webb: And they do, they brag about that.

Estess: They dubbed me the "mayor of"—well, we're sort of the mayor of the city.

Launius: That makes sense.

Estess: Yeah.

Webb: But now we don't call it just a federal city, it's a federal-commercial city, I mean, which is a better description right now.

Launius: It's a research industrial park.

Webb: Yeah, um-hm.

Launius: That's multi-agency and private and public.

Estess: Right, it is, right. We have people who work on center, that come through a gate everyday, with a badge, who work for companies who have no contract with the federal government. They work in the Army plant. The Army plant has been commercialized, and so there's some companies over there who manufacture things that are not under contract with the federal government. It is using a shut-down military facility. But they come through a NASA gate every day with a NASA badge. They ride on a NASA street, and if they run into the ditch and get hurt, we pick them up with a NASA ambulance. How do you do that? I don't know but we figured it out.

Launius: Yeah.

Estess: And so we've got an industrial park *inside* a federal installation. Again, it's not the only one in the country, but they're not many.

Launius: Yeah, yeah. That's very impressive. How much time do we have?

Estess: I don't know. Keep going.

Launius: All right. We should be done before then. One of the things I wanted to ask you about was, you got tapped to go over to JSC, what, January, I guess, of last year and spent a little over a year there.

Estess: [Yes].

Launius: That was obviously a unique and different experience for you. Not the first time you've been tapped to do special things, but clearly an important—especially in the context of the space station and its financial difficulties. Can you tell us a little bit about how you ended up with that particular task and how you approached it when you got over to JSC?
Estess: Well, I was sitting here, doing my job on a Thursday and I got a call early in the morning from Mr. Goldin. And he said, "I need you to do something, consider doing something for me." And I said, "Sure, Dan, what is it?" And he said, "I'd like for you to go over to JSC and run the center for awhile." Well, I was floored. First of all by the fact that my friend George was going to be asked to step aside. George and I've known each other for years and years and years, and I consider him a real icon in the space business. And Dan was very, very—it was not a directive, because I'd had bypass surgery the year before, and he said, "You know, I want to make sure that you, you know, don't kill yourself, but I really need your help on this. And we decided that you can do what needs to be done." And I said, "What needs to be done?" He said, "Well, we need somebody to smooth the waters and take the center through this transition until we can figure out what to do. And we've got—we're under a lot of pressure on the space station. We've got this four billion dollar problem that's been surfaced to the OMB and the administration's not happy with it and want us to straighten it out. And so we're going to have to make some changes, and that's just the way it is." And he says, "We want you to go and talk to Zann"—he knows my wife and so he called her by name—"and see what she says." Little did I know that there were conversations going on at headquarters about whether or not to proceed with this. Not just at headquarters but with the OMB and the White House. And so [by] Thursday night, [that same night], he changed his mind for several reasons I won't go into, and he told me, "Hey, forget it. We're probably not going to go this way. Thanks for considering it. See you." I didn't tell a soul here, of course. It was very sensitive and my secretary was observant of all this Goldin traffic and inquired, you know, looked at me with inquiring eyes of "what's going on," and I didn't tell her a thing. Well, Friday morning I came in and I got another call from Mr. Goldin and [he] says, "We've got to do this, and as unpleasant as it is, we've got to do this and so we've got to proceed. Will you do it?" And I said, "Sure, Dan. And he said, "I need you to go over there for three to six months, three to six months, to do what I'd already [outlined]." And I [said], "When [do] you need me over there?" He said, "Tomorrow morning, nine o'clock," [and] that was on Friday. It was five o'clock on Friday night and everybody had gone. And I told my secretary, "I need to go to Houston in the morning." She says, "What is going on?"

Launius: (laughter) Did she put two and two together?

Estess: No, she had not figured it out. And so Janet Austill was the first person I told here. I said, "Janet, I'm going to JSC for several months and I need to be out there in the morning." And she was shocked and so she, of course, arranged my travel Friday night. And so she and I stayed here Friday night, and about nine o'clock on Saturday morning I walked into Building One at JSC. And Joe Rothenberg had flown down that night. Joe Rothenberg and I and George and Bill Parsons—Bill Parsons was a key player—and we spent the weekend sorting out this transition. Several things happened that weekend. Saturday afternoon Jim Weatherby, who was a deputy center director [at JSC] previously, was [preparing] to fly the following week on STS-108, [as] commander. And he was, he and his crew were very [concerned]. Weatherby came over to see me Saturday afternoon, and I know him very well and he and I had a talk. And that night he called me at the hotel

and said, "It's OK. We're going to do our job and you do your job." And they went away and did a beautiful job, of course, did a better job than I did, probably. But the first weekend was rather tough. My friend George—and then at eight o'clock on Monday morning, the first meeting that we had—we being George and I, Rothenberg did not go with us—we went over to Building Four and we met with all of the astronauts in the auditorium to tell them what was going on and [what] we were going through—George is such an icon in astronauts' eyes. And so the transition started [then and there]. Over the next several days, George moved out of the building, moved off center. It was a hard thing to do for all of us. It was hard for George. It was hard for me. It was hard for the center. It was hard for Dan Goldin. It was hard for everybody.

Launius: Yeah, he told me it was the hardest thing he ever did.

Estess: It was very, very difficult.

Launius: That moving Mr. Abbey aside—

Estess: [Yes], it was very difficult. And I talked with Mr. Goldin. I can say that [with] much reverence now because this was tough for him to do. He was being administrator at that point, and he was doing what was best for the agency. It had to be done.

Launius: Um-hm.

Estess: And so I was called upon, and my first reaction was—I knew when Goldin called me on that Thursday that this was a big deal. This wasn't just some little lark. And so consequently I took it very seriously, and when I showed up there, I took it seriously. And Rothenberg was a huge amount of help. Joe stayed around but he stayed in the background. But Parsons and I really began to take it on and Bill Parsons was a huge amount of help. It wound up being much longer than I thought. I stayed over there one year, one month, one week, and one day, over thirteen months. That particular [time observation] was not made by me but was made by JSC and given to me when I departed, how long I'd been there. I didn't even know. And they told me it was one year, one month, one week and one day, it turned out to be. We immediately dived into the problem of stabilizing the center and that meant talking to key groups of people and talking to the center. Without going through all the details, let me just tell you there was a marvelous reaction. And my opinion of the people at JSC has always been high. JSC's been a flagship center as far as I'm concerned, and it is *the* flagship in human space flight. I want to tell you that the people of JSC could not have reacted better. [Although], they felt uncertain, they accepted reassurance that things were going to be OK. They put their heads [down] and went back to work, and the record indicates [how great] they did. During the year I was there we launched and recovered six space shuttle crews. We dealt with the Tito issue. We dealt with 9/11. We [restructured] the science program. And we dealt with the demise of Mr. Abbey. The people of JSC just were outstanding. I will always be grateful [to] them for supporting me in such a fine fashion. They were supporting themselves and they were supporting [NASA]. Their love of the human space flight business is what drives them. JSC is deeply populated with outstanding people who could make many times more money than they make by coming to work for this government [organization].

I mean to tell you, I was talking to a particular astronaut who's an outstanding astronaut who happens to be a medical doctor—

(The interview continues on tape two, side one.)

Launius: —about a medical doctor who was an astronaut.

Estess: I was talking [to] a particular [astronaut who is a] medical doctor who was just back from a flight. He did a great job walking around on the outside of the space station. I said, "Why are you here? You could make five times as much money being a medical doctor." And he said, "Anybody can be a medical doctor. Where [else] can you go be an astronaut and [travel on the shuttle to] the space station?" And I said, "Well, not anybody can be a medical doctor." And he said, "I'll do that later." The point I'm making is, that's just one little story of many, many, many that were told to me of people who had been enthused by the business of flying people in space and who had shaped their lives, personal commitments, financial structure, around, willing to be involved. They [have] migrated to Houston to be involved in it. It's a wonderful enterprise and I saw it first hand at Houston. I come away with the greatest respect for the people that work at JSC. And then there are thousands who are associated with JSC at other centers [and] in the industrial complex who feel the same way. There's tens of [thousands of] people that are involved in this process. And that really sort of touched me. I'm telling you, I really got—I fell in love with those people for the work that they do. And so I worked with them for that year and they did a great job. And so people have asked me, "Well, why didn't you stay?" Well, the real truth is that Dan Goldin and Joe Rothenberg never [asked] me to stay. There [were] innuendoes and talk but they never did offer me the chance to stay. So that's the real historical truth. But it was—my life is here, my love is Stennis and I'd always planned to come back here. And it lasted too long. It should not have lasted thirteen months. But a series of happenings, many external to the agency, tied up the selection of a new center director longer than it should have. But we dealt with, as I said, the Tito flight and that was a huge thing to start with. And—

Launius: Would you be willing to talk about that a little bit?

Estess: Sure.

Launius: OK. How did that arise and what was the reaction down there?

Estess: I just have to be honest here. I think we handled it fairly poorly. We, the agency, and we, JSC, lead the administrator down the garden path. We let him get [convinced] that this was going to be more difficult than it turned out to be and that Mr. Tito required much more psychological examination and training than he ultimately got and successfully flew with. We, I think, imagined his character being different than it turned out to be. And so for a couple of months we labored with our Russian friends and we had [repeated] telecons with Mr. [Goldin and the Russians]. [With] Mr. Goldin [and with] our Russian friends and our teams of people, our astronaut core develop[ed] protocols on how to deal with this situation. We documented agreements, and [headquarters] and others were all involved in how to [accomplish this safely]. We labored over this thing. We went in on Sunday and had telecons on Sunday night with Mr. Goldin and everybody who was involved. We

labored over it, labored over it. Mr. Tito came to JSC [one time] and stayed out at the front gate and never came in because we never could [not] reach agreement. I never met him. Spent hours talking about it. We didn't handle it very well. The Russians needed his money. Our Russian friends are great space travelers, space pioneers, and Yuri Gagarin will always be the first in space, but they needed money. And they felt like—and now they've sort of proven after two of these flights—that they could pull this off safely and it would not be a huge interruption to the space station. And so our whole team labored and we put two particular people, two people in particular under enormous stress. They handled it wonderfully well and historically ought to be recognized for how they handled it and that's [astronauts] Jim and Susan Helms. They were on orbit, [in the space station], dealing with this and we were relaying rules to them. And I could sit and watch the television as it beamed down pictures and I could see them react to these rules, getting in and out of pictures, and getting out of the way of the camera. And so I said to myself, "I owe these people an apology." Well, when Susan and Jim walked back in the first room at JSC [Ellington Field] after landing and were still so weak they had a hard time standing, I walked over to them and I said, "Sorry we treated you so roughly." And the word went out all through the astronaut core that we had done that. We put them under an enormous amount of stress in the Tito flight. Mr. Tito went up and flew and he did fine. And his performance and public response after he'd been back has been great. We could have probably gotten more mileage out of his flight if we had managed it better. I think we managed it pretty poorly. I don't blame it on Dan Goldin, I blame it on all of us. We let him get committed; we lead him down that path. He took a hard stand then and we supported him taking that hard stand. We all struggled around with it. And then Mr. Shuttleworth flew, hardly a ripple.

Launius: Right.

Estess: He went down to JSC, he trained, he [got] into the astronaut [training] system there, and we trained him for awhile and he's flown successfully. And now the Russians are going to sell other seats because why? They need money.

Launius: Um-hm.

Estess: And one of these days we Americans will figure out that people are willing to pay to ride on the shuttle and we'll figure out how to do that. But we'll be slow in doing it and the Russians will have been way ahead of us in selling seats.

Launius: Are they going to fly some more people? Lori Garver wants to fly!

Estess: You betcha.

Webb: Yeah.

Estess: I don't know whether Lori will get to fly or not, but they will [fill] that third seat of the *Soyuz.* By the way, [there are] flights on the shuttle that we could fly somebody.

Launius: Um-hm.

Estess: It's just a matter of deciding. We've had a lot of—we did a lot of talking about it and there's actually been good a fair amount of thinking, work done on it. And we were on the path to fly somebody commercially but it—I had several meetings with this individual [as did] Dan Goldin and Charlie Precourt, chief [astronaut]. Jim Cameron came to KSC [several times. He is a talented] prince of a man. He's, for the record, you know, he's a—

Launius: Right. Oh, he's a cadet.

Estess: Yeah, he's the producer of *Titanic*, or director of [the movie] *Titanic*.

Launius: Right, and wants to do a space movie. I think he's planning one.

Estess: [Yes], in fact he had Sony build a camera for him that he was going to use in space. And so we went ahead and put the camera in test and had a few little problems with it and it's back being worked on now. But 9/11 sort of interrupted his business. But he was not going to do this with his money. This was a business venture of investors who were going to develop this space movie. Cameron made an observation that we NASA are not very good at telling this story.

Launius: Yeah, that's right.

Estess: And he's right.

Launius: Um-hm.

Estess: He is right, and the people who are in the business could do a better job. Tom Cruise, you know, just narrated the latest—

Launius: About the ISS—

Estess: [Yes], well, when he came out we had a lunch with Tom Cruise and we talked about his business and our business and the fact that they were in the business of communicating with the average—and I don't know what average is—but with people. And that we, while we consider ourselves pretty good, we're not in their league with communicating. They do it for a living. And Tom Cruise said, "Boy, I'd love to figure out, help you, how to do that." And by the way, the administrators had a follow up visit with Tom Cruise.

Launius: That's good.

Estess: Tom Hanks has said the exact same thing. They're just wonderful people. And if we could figure out how to use them to help tell the story and share the experience of what we do with many more people. [The American people are] paying for it, we [should better] figure out how to share the experience. Well, the Jim Cameron [idea] has temporarily been put on hold but hopefully it will resurface when times are a little better. But we were going to fly Jim Cameron on the shuttle and try to figure out how to do it. We were actively working to fly Jim Cameron on the shuttle so that he could direct the making of a commercial movie [that] they were going to pay for. We were going to charge the cost of

the flight and so forth. And so it wasn't going to be a freebie. The point is that Tito opened the way with the Russians and we will sooner or later figure out how to [fly] people into space for [dollars]. But flying the shuttle is an expensive proposition. Buying a seat in the shuttle is going to be expensive until we get a vehicle that will fly a little more economically than this one. The Tito [flight] was a groundbreaking event. Now having occurred, the rest of them will be easier. Also it shows that you can fly people with a professional crew and they'll take care of you. If you've got somebody to take care of you—I mean, I get on [airlines] and fly all the time and I got no idea how to drive that thing. I don't even know where the switches are even though I'm an aeronautical engineer, aero*space* as they call them now. But somebody up front does know how and the same thing with space craft. You've got somebody up front that knows how to drive it, then you can have other people that go that don't know how to drive it. There is a lesson there in how we train astronauts and we're working on that also.

Launius: Space station has been a remarkable program in all kinds of ways. I was talking to Jeff Bingham recently and we [noted] that the political coalition in support of Apollo really began to crumble after about three or four years. The political coalition, while there's been some ups and downs on space station, has now lasted for some eighteen [years]. And we built this thing and we're in the process of completing it. And it's up there and there's a crew aboard and that's very remarkable. And it's much more complex than anything we've ever tried in the past just because of the international involvement. Yet there seems to be a perception in most people's, in the public's mind that this is somehow a disaster. And you had to deal with that when you were over at JSC. I'm assuming your perception is not unsimilar to mine that it's a remarkable achievement. What kinds of things did you do to (a) eliminate the problems that were in existence and, I guess, still are to some extent as well as try to communicate the larger questions of public perception and try to negotiate that. Can you speak to that a little bit?

Estess: Sure. First of all, it's interesting to me that you, as a historian, captured the eight—the number eighteen. That's right. Actually, nineteen years ago I went as the Deputy Director of [the NASA's National Space Technology Laboratories, now SSC] to Wallops Flight Facility and [I worked] for a couple of days with other deputy center directors at something we called the Space Station Management Colloquium. I'm the only one still in NASA that went to that colloquium. My team leader turned out was Paul Holloway, later director of Langley.

Launius: Oh, yeah.

Estess: And I talked with Paul last year about that and our job that weekend was [to] come up with a strategy on, quote, "how to manage the space station." Eighteen years later we finally began to launch a piece of the space station. That's too damn long and too much money having been spent and a terrible record of success. Now, having put that aside, fast-forward [until to]day. The space station is a *huge* success and is deployed. And the fact that the Congress stuck with us for eighteen years is fairly incredible.

Launius: It's remarkable, yeah.

Estess: Because we—it's taken us nineteen, [it will take] us twenty years to build this thing.

Launius: Um-hm.

Estess: Now there's all kind of blame to go around. We've redesigned it five, four or five times. It's been up and down, changed around. We've moved it in and out and so forth, but now we're finally getting it built. Some day you historians will have to try to dissect why it took twenty years and what programatically was right and what programatically was wrong. But during my involvement, tenure, I was blessed at JSC to have an outstanding program manager named Tommy Holloway, who was under a lot of pressure. He felt the pressure personally [because] NASA was under attack. And now let's just look at what's happened. Everybody in the food chain has been replaced. Mr. Goldin, Mr. Rothenberg, Ms. Haus, and Mr. Holloway.

Launius: Right. And Mr. Abbey.

Estess: And Mr. Abbey. I missed Mr. Abbey. I'm sorry, shouldn't have. Five people in the [organization's] food chain, and they all have been replaced. The country clearly was unhappy with the cost performance of the space station. So when I went [to JSC], that's what we were dealing with and I wish I could claim even a minuscule amount of credit. The only thing that I did that maybe affected where they are is, I continued to pressure the program and to lobby the workforce at JSC that they had to think differently about cost. They had been trained that they should do a good job and do it as cheap as they could. *But* the phrase, "It will cost what it costs," had been uttered by senior management and had been captured around the system and had been misconstrued to mean that JSC does not care what it costs. And JSC was under attack for not having an understanding of the cost, not having the capability to predict and track the cost, and therefore not being able to be very believable in their projections of what costs would be and much less any assurances that those costs [estimates] could be met. And so during the time I was there I continued to lobby, if I can use that word, lobby [or leading] the key people in the program in the financial system and in the management structure [to put more emphasis on cost management]. I didn't say, "You're bad, you did it bad." They did it the best that they knew how to do and the way that they've always done it. They just never had been challenged to do it any differently. I went at it from this direction. We at JSC are sitting here wringing our hands about what Washington is doing to us in the human space flight business program. And I [said], "I want you folks to think about this in another fashion. The Japanese are building capability and dream of putting somebody in space in addition to with us on the space station. The Europeans"—in fact, I went downtown and had dinner with the European Space Agency representatives, who told me that they were talking to the Chinese about possibly [equipping] an Ariane vehicle with the Chinese [capsule] and firing people into space. [Russia] and the USA, Johnson Space Center, do not have a God-given right to be the only one that flies people into space. And so I suggested to every group that I spoke to at JSC, "If you people don't try to figure out how to do this business just as safe or safer, at a much reduced [cost], then you're going to be put out of business by international competition. It will not be Washington that puts [us] out of business, it'll be the competition. And so your motivation is to quit worrying about Washington and worry

about doing a better job at cost and cost control." That point seemed to resonate. They did believe that. They do believe that. There are others around this globe that see this business as having merit, and if you can fly—and I'll just say to you, Mr. Tito, it's a damn shame that the first commercial passenger into space, an American, had to go buy that seat from Russians. And so I was preaching the whole time. My tactic was not to try to do it for the program, but to say, "You'd better pay attention to this." And I want to tell you that I got very positive response. And at the same time the Young Committee, the Tom Young Committee had the same theme: "We've got to do a better job." The program started out saying, "We're doing a good job. We know what it is. We knew that this overrun was there, we just didn't know when to surface it." Now the program is saying, "You're right. We need to be doing a better job," and has put in place, both civil servantwise and contractorwise, substantial capability, including capability that's been developed and proven in the military programs of estimating and tracking, predicting costs. And therefore I predict that the cost performance of JSC and the program in the future is going to be substantially improved. Do I deserve the credit for that? No. All I did was just encourage them that this is something that had to be done. Tommy Holloway, to his credit, came around to that conclusion and took the lead in making these changes. The CFO out there, who previously looked over the shoulder of the program, said, "Hey, what's the numbers and I'll report them." He's gotten accurately involved in and understands what the numbers are and what they're based on. So there is an improved level of sophistication, and it's not where it needs to be yet, but they're working on it. And I think that the results are not in but I do believe it'll be successful. The 4.8—it's actually a 4.8-billion-dollar problem—was soon worked down to a billion-dollar problem, space station [problem] plus another billion-dollar problem for science. So the 4.8 was worked down to about 2 billion dollars and they're continuing to work on it to get those costs down. But that extra [costs requirement] that we had to surface was not very well received, to put it mildly, and resulted in a major change in the program and major change in leadership. That's what [caused the major leadership shakeup].

Launius: Oh yeah, yeah.

Estess: Mr. O'Keefe has a clear message that we will get this cost under control, we will manage it to the dollars that we say we will, and that future expansion will be driven by our science [objectives] and not what we want to do. So our science needs tell us [what] we need to do, [and that] will drive us. That's what his theme is. We haven't quite flushed out all the details of that, but we understand it's a new day. So does that address what you were—

Launius: Oh yeah, very much so, very much so. I am amazed, and quite frankly, getting it down to a billion-dollar problem for science and a billion-dollar problem on the technology is a remarkable achievement in itself. I've talked to some of my friends in the DOD, and they shrug their shoulders and don't understand. "Well, just go get some more money," which is their approach. We don't have that same luxury.

Estess: That has been the approach of NASA over the years, though, and some of the older managers had been trained that way.

Launius: Um-hm.

Estess: That Washington would give some more money. So we went up to Washington and told them we had a four-billion-dollar problem and [headquarters] said, "Oh, OK. Well, go over and tell OMB." We went over and told OMB and OMB says, "The hell you say." And we said, "What? That's not the right reaction." And so that's where we—that's how we got into this. But the point is that JSC did think that they'd give us more money and that Washington thought that, "Well, it's unfortunate, but we've got to give them more money." And so NASA had gotten in trouble and JSC was at the point of that getting us in trouble. And now JSC is going to be at the point of getting us out of the trouble. They're working hard on it.

Launius: Right, right. There's also a perception up there—and maybe you can address this a little bit—there seems to be a perception that the problem was known and then hid[den], which makes it look like a cover up. And that's how some people like at OMB reacted.

Estess: Well, that's not true though. I was a manager down here from out-of-the-way Stennis, and I've been going to these senior management meetings for years. [Even I knew] that we were not—that the funding cap, annual funding cap of two billion dollars on space station, is the wrong way to develop any [large] program. Some years you've got to go higher, some years you'll be lower. But that funding cap and the development problems that went with the station caused the managers to take increments of work and slip them forward, say, "We can't deal with that right now." That did two things. One is it drove the cost up because it costs more money to do it in future years than it does now. And also it'll sometimes encourage you maybe to spend more money on solving your current problems than you need to because you had the option to send it forward, although you shouldn't do that. And so we saw, even I saw, and I didn't have a [program assignment], if you will at the time. My job was just testing the machines that [place] the space station [in orbit]. But I would sit there in the management meetings with Mr. Goldin and the other associate administrators and center directors, I knew that we had a big [problem], all of NASA did. It was not a revelation when they went over in the fall of 2000 and told OMB. We knew that. By the way, there were key people at OMB that [also] knew it, too.

Launius: Yeah. I know that.

Estess: And so—but it also all of a sudden got to be painted politically and in the press by the fact that NASA has got this great revelation. We knew that was coming for years. But we had [a] new administration and [a] new time, [but we miscalculated and got a very negative reaction from the new administration].

Launius: Right.

Estess: And so we're big boys and we have to accept that. But we knew that when we were moving costs forward that we were ultimately going to have to deal with. Some of that is still there. For instance, we've done away with the hab module.

Launius: Right.

Estess: That's one way we got rid of, part of the four point billion dollars is [to] get rid of the habitation module. The habitation module was going to be a place where you could have a kitchen, a galley, and where astronauts could have sleeping quarters and you could have a habitation module. We've done away with that and now we're going to let the astronauts do like they do now. They sort of hang out. Some of them hang on the wall down the street, some of them hang on the wall up the street, and the Russians hang on the wall down in their *Soyuz* capsule and they sort of get together somewhere and have a meal. There's no dining hall. They get by fine. And so we've decided, "OK, if they get by fine they can get by later." But if you're going to operate this thing for fifteen to twenty years—

Launius: You've got to have a place to live.

Estess: You probably want to go back and build a habitation module. Will it be built in future years? I hope so. Is it in the plans now? No. But it was in the plans and so we dropped it out. And we dropped out other things like that to take that cost out. The hab module, by the way, the Europeans were building it. And it may be that the Europeans will go ahead and build it, anyhow, without us.

Launius: Um-hm, yeah. Oh, the Italians are actively talking about that.

Estess: The Italians are actively talking about going ahead and building it themselves.

Launius: Right.

Estess: Right. And so I would be pleased to see the Italians build it.

Launius: Um-hm.

Estess: They build nice [space] kitchens. (laughter) To have a nice Italian kitchen in space—

Launius: Oh, they've got a lot of capability?

Estess: [Yes], they've got great capability. This, these logistics modules that the Italians built [are] great. They are working fine, they're working great.

Launius: Well, and that's one of the things that is—I've said this before—that's remarkable about this: that all of these various nations are building these various pieces and they fit together and *work.*

Estess: Right.

Launius: That is remarkable.

Estess: Right. And I got to know this Italian astronaut who has flown, you know. It was great to see him fly and lead in the first flight of a—I guess the first module was *Leonardo.* And I asked them—"we've got four modules and they're all named after some famous Italian painter." And I said, "You know, how many more painters have [you] got, tell us

how many more modules we can build." They said, "Oh, we've got endless number of painters. We've got plenty names. Don't worry about names." The Italians are a real pleasure to work with.

Launius: Um-hm.

Estess: They build good hardware.

Launius: Right.
Estess: Next subject.

Launius: Right. Well, I guess my next subject is kind of to wrap up a little bit. One of the things—there's a cartoon. You've probably seen it. It shows two scientists. On a blackboard they're drawing equations, talking about something, whatever it is. And there's an equation on this side and there's an equation on this side with an answer. And in the middle there's a big box and it says, "And now a miracle happens." That is a little bit like what I think of sometimes when I think about NASA. There is all this stuff we've done. There is long-term, twenty, fifty years out, I think all these remarkable things that we're going to see. And in the middle, short-term, next ten years, it's like—and a miracle's going to happen hopefully. Fifty years from now, a hundred years from now, what do you think people are going to see when they look back on space flight, and how will they look at our accomplishments?

Estess: Well, there's two ways to answer that and my tendency is to answer it with the way I hope they see it. And then that's probably the right way for me to answer that as opposed to trying to say and predict how they *will* see it. As I've said earlier in the discussion, I believe that people—I do not believe that this [five] and a half, [six] billion people that live on this ball we call Earth are destined to be stuck here. I believe if we all of a sudden located that big asteroid that's going to get us, we'd get busy and try to figure out how to preserve human life, somewhere. By the way, it's not a matter of if we're going to get hit, it's just a matter of when.

Launius: Right, right.

Estess: And it's unlikely that the human species will survive forever on this earth. We'll probably get, go by the way of the dinosaur. I don't want to be morbid, but that's just the way it is. And so I think that we have a reason to put a little of our investment in learning how to live and work away from [the Earth] and going to Mars or going to wherever and see what we can find. There's commercial reasons, energy and so forth. There's lots of reasons to put some money—therefore I believe that we are committed to this business of flying into space and that we will be doing it. I do not see us putting all the rockets on the ground and saying, "Nobody's ever going to fly in space again." First of all—well, we've already discussed that. Therefore, fifty years we've demonstrated is a pretty short time. I've been involved in human space flight somewhat just a little less than that, thirty-five years.

Launius: Yeah.

Estess: And we had a hell of a lot of capability thirty-five years ago. We went to the moon. And we don't have the capability to go to the moon anymore. But we can fly these vehicles in and out of space. We know more about routine operations in space, but we don't have the capability to go to the moon. As they look back fifty years from now, I think that there will be—I think that they will say, "These were the pioneers. They went to the moon and now going to the moon is rather easy. Look how hard they had to work to get to the moon." And now we have devices that do it much easier. And we understand better what people have to go through when they fly in space. I hope by that time we've located water on the moon or on Mars or on an asteroid around Mars and that we're routinely flying people into space. Fifty years is not very long to pull something like that off. [In] a hundred years, [it] certainly should be being done. The most startling number that I can give you to me is that the century that I was born in, the twentieth century, the beginning of that century, there were eighty-five million people in the United States.

Launius: Um-hm.

Estess: At the close of that century, there were *two hundred* and eighty-five million people. The problem that we face on this earth is the one that's being summarily ignored by all the countries, by all the politicians, by all religious leaders, and we sit here in our divine wisdom—and I am a Christian—and we say, "Those terrible Chinese. They only allow you one baby and then they sterilize." They're two thousand years ahead of us. The fact that there's [six] billion people on this earth, if there is ten billion people in fifty years which some predict and in a hundred years twenty billion people, that's a damn problem.

Launius: Yeah. Population explosion, right.

Estess: That's a problem.

Launius: And resource drain.

Estess: And so we may have other *major* motivations to be able to travel away from this ball. This ball won't be nearly as attractive with four times as many of us in a hundred years as there is now.

Launius: Um-hm.

Estess: And so therefore—and that problem is being summarily ignored. So it may be that those people say, "I'm glad that those people worked on solving this problem so that we can go work on this." That's sort of a morbid assessment but I believe that flying into space is a destiny and it's not just for fun. There's some rational reasons for doing it.

Launius: Um-hm.

Estess: Now, you know, before we close up, this'll probably be my last time to talk to an historian, the NASA historian about—

Launius: Don't bet on that, but OK.

Estess: But, at any rate, I want to—and putting it in a context of NASA it's—when I was, when the idea of coming to NASA was put before me by a friend of mine who invited me to come down to NASA and check it out, I thought it was interesting, but only interesting. I was an airplane guy, working for the Air Force, building war machines for Vietnam, putting in guns and that sort of thing. And so I came down on a lark to visit NASA and NASA hired me in 1965 and I reported in on February 12, 1966. And I, at that time I had just six years, about five years of experience as a young engineer having started my career in 1960. And so as I look back on all those years, we came in with the expectations of going to the moon. And my father-in-law thought I was an *idiot* for quitting my good job with the Air Force and going to work with these *imbeciles* who thought they were going to go to the moon. And, in fact, he didn't believe until years later after we went to the moon that we really did go to the moon.

Launius: (laughter) Some people still don't, unfortunately.

Estess: And so to come down here, to personally get involved and to climb in and do a [liquid hydrogen] tank inspection [on the S-II], the vehicle that was used to carry Neil [Armstrong] and Buzz [Aldrin] to the moon—and as I look back over that Apollo experience—there are only three of us here today that worked for NASA, that are Apollo-types. There's only one person that works for NASA at Stennis today who was a civil servant here during Apollo and that's me.

Launius: Really, wow.

Estess: Those other two were contractors and they now work for NASA. I'm the only one here as we interview today that was here during Apollo. There's no other civil servant that worked for NASA during Apollo, I'm the only one. And then as we made the transition then from Apollo to shuttle and we started thinking differently and then we did shuttle and then as we now are doing space station, I look back over that span of time and I say, "Apollo and space shuttle and space station, that's an incredible adventure." And I was able to do that in my home State of Mississippi because of NASA building a place here. A kid from Tylertown, Mississippi, who grew up and went to engineering school, got into this business, and was able to be involved in this enterprise at home, in Texas and Washington, is a rather *incredible* story. If I had envisioned that and told anybody that when I was in high school, they would have said, "You idiot." So as I look at that, that's an incredible happening. I suggest to you that that story is played out many, many, hundreds, thousands of times throughout this business, that people from obscure places in the country—cheerleaders from Long Beach High School who, like Myron Webb here, who would never have *dreamed* that she'd be a major figure at an agency—so this is not only a great enterprise technically but it's almost an emotional undertaking that, I dare say, there's not many corners of the federal government that you could identify with that have such strong attraction for people. That is got to have high value and does for members of the Congress. I've been up on the Hill numerous times. Been there with astronauts. Members are just like my grandchildren: they don't want these astronauts to come up on the Hill with their business suits on, they want them to have these flight suits on. They want to stand beside them and get their picture hung. They want to have that picture autographed. They want to hang it on the wall just like my grandchildren. People love this business. The inadequacies and the shortcomings in this business is our inability or maybe

unwillingness to share the experience in a way that it ought to be shared. The last people that you want to ask to explain how this feels are a bunch of engineers. Engineers don't feel, they measure, they put numbers on things. They don't feel. Feeling is not a term that you find in any engineering books. Feeling is what historians deal with and what public affairs people deal with.

Launius: And, by the way, Dan Goldin was good at communicating that.

Estess: Um-hm, he was.

Webb: The emotion of space.

Estess: He was, he was. And so we need to, in today's competitive environment—we talked about the country looking in other directions. I get on airplanes and I ask people what they do and then I tell them what I do and they're always, "Oh, you work for NASA. Oh really, oh really."

Launius: They think it's cool.

Estess: Boy, really cool. And so I, depending on who they are and how they sound, I start engaging them in space, and I say, "You like the space program?" "Absolutely." "Do you think we ought to be doing it?" "Sure, it's great. Wow! Wow!" I mean, it's just exciting. And we've had studies that some of our companies have done, and you ask them, the American people, in large numbers, 80, 85 percent, say, "Absolutely." Then you [ask] the question, "Look, we have one extra dollar. You think we ought to spend this dollar on medical research, health care for the aging, housing for the homeless, police protection for all of us, environmental protection, natural resources, or space?"

Launius: Yeah. You stand at the end of that line.

Estess: We stand at the end of that line. Therefore, we have to do a better job of showing to the American people why this is relevant to what they do and why there's return on their investment. But for those of us like me who have spent their life in it and caught up in it, it's been [a] tremendous, tremendous honor. Not without stress and not without consternation, not without disappointment but an *incredible* adventure. My regret is that I look at my young colleagues at this center, all of which are younger, and I worry that they'll never feel an Apollo or a shuttle development or station development like I felt to be involved in it. And I hope I'm wrong. I hope they will. But having been in and climbed around in the second stage of a *Saturn V*, which is what I worked on—and I was given my first shuttle job in 1970 when I made some studies in shuttle facilities. It's been a great ride to be involved in the space agency. And so there's a certain emotional—

(The interview continues on tape two, side two.)

Estess: —where you get that kind of—you extract that kind of commitment out of people in the federal government. I'm sure there are other places. I just don't know about them. But you do in space.

Launius: Um-hm.

Estess: I'm not at all unique in the space family, not at all unique. And so it's a great, great enterprise. And I hope we managers and those who come after us are good enough to continue to solicit the kind of support we need out of the Congress to—I think there are those in Congress who want to be led, who want to be encouraged to support, want to be given the [information and] tools to support.

Launius: Um-hm.

Estess: And you know Sean O'Keefe has good communication skills. He may very well be able to do that in fine fashion. So, Roger, I'm glad to have had this time to document some of these feelings with you. It's been a great, great enterprise.

Launius: I appreciate you sitting down with us today. Do you have any final questions you want to ask?

Webb: No.

Launius: OK. I think I got through most of them.

Webb: Yeah, I think so. I'm glad you talked about JSC.

Launius: Yeah.

Webb: And public support of the space program. I did want to throw that in, so we covered a lot.

Launius: Yeah, we really did.

Webb: I told you he was easy.

Launius: Oh, he's great (laughter) and very reflective. I mean that's terrific. So thanks very much. I appreciate that. I contend that one of our major problems is—or it's not really a problem, a challenge that you have, is to communicate more effectively with the public.

Webb: Right.

Launius: They just don't seem to understand.

Estess: The public is hard to communicate with.

Launius: Yeah.

Estess: You know, when you read the numbers—first of all, the high number of the public that pays taxes doesn't even speak English.

Launius: Right.

Estess: You start there. And then the high number of people who just get up every morning and labor like the devil to get through the day, and they [haven't] got time to sit around and reflect about the glories of flying into space.

Launius: Right.

Estess: And they from time to time stop and enjoy a movie or a television program about space, but they're generally supportive.

Launius: Yeah.

Estess: And then it boils down to the leaders and the few people who have to be out on the point of the spear and say, "This is doable. It's worthwhile doing and we ought to do it and let's do a good job of it." And that's what our job is.

Launius: Um-hm. Well there's a real excitement to it that doesn't exist in other avenues of life.

Estess: No, it doesn't.

Launius: And that's true and that's one of the reasons why I think so many people in NASA are so dedicated to it. I think I would probably throw myself off a bridge if I had to work for like GSA.

Estess: Yeah.

Launius: Not that they don't do important things.
Estess: Oh, they do important things, but that's—I agree with you. And, you know, I've worked for the Air Force, but the military's a clear mission. The federal government does a lot of good things, but NASA is just in a category by itself.

Launius: Right. OK, well, thank you, sir. I appreciate your sitting with us this morning and spending so much time. This probably won't be the last time we'll interview you. (laughter)

Webb: But I wanted it on my record.

Launius: There is one thing that—and actually, let me ask you about this before we quit, if you've got another a minute or two.

Estess: OK.

Launius: Mr. Goldin talked about this, Mr. O'Keefe is making this a big issue as well, and that's this issue of human capital.

Estess: Yeah.

Launius: And you mentioned something about it earlier. Do we have the capability today we had ten years ago or twenty years ago or whatever? What are some of the major things that we really need to do to insure that we have the technical base necessary, not just for NASA but in this country, to continue to be a leader in the world? Obviously, there's education and so forth, but are there things that we should be doing at NASA to pursue that?

Estess: Absolutely. Roger, the worst thing that came out of the last decade in Mr. Goldin's tenure is the fact that we didn't have [enough good young] people. The most horrifying statistic that I can quote to you today is that I'm a guy that's sitting here, that's spent all these years in NASA, and I'm over sixty years old. There are more of me in the agency than there are thirty years and younger. That is awful. That is a tragedy. I learned that when I used to be a Boy Scout master, and one year we had sixty-six boys and we closed the membership to the troop for a year, and two years later I looked around and I didn't have any thirteen year olds. I said, "I wonder why I don't have any thirteen year olds." Well, we closed the membership. Today we're looking around and we don't have any twenty-five year olds. And ten years from now we won't have any thirty-five-year-olds. Oh, there may be a few drift in, but we need to be bringing in young people. In order to bring them in, though, you've got to have a vision of what you want to do with them, because the ones you want are the smartest and they want to work on exciting things. They don't want to come in and just tread water.

Launius: Right.

Estess: So you can't fool them. So you've got to have good work [at] good places. And so the biggest human capital challenge we've got, in my view, is the fact that we've got over four thousand people that are retirement eligible and we have allowed the human capital-base of this agency to deteriorate to a dangerously low level. It can be rebuilt. I mean, after all, we built it from nothing in Apollo. And I came in not knowing what a rocket was. And they put me to work six hours a day and to school six hours a day. Six hours a day for the first six months I worked at NASA we went to school in this building. And they taught us, "This is a rocket and [this is] the engine. This is an engine and here are all the pieces of it." And we spent weeks studying engines. We spent weeks studying pressurization systems. They trained us. We can do it again, but it's expensive. And so is it—does it put you out of business to be—no, but it sure does weaken you. We need to be bringing in several hundred youngsters every year to work for us. Mr. O'Keefe is fully aware of that, he's fully aware of that. Now Dan Goldin was aware of it, but he didn't start working on it until his last few years. If you remember the first five years though we didn't hire anybody.

Launius: Right. Yeah, it was all attrition and downsizing.

Estess: Right. Downsizing and attrition. But Dan finally decided [he] knew that we were getting in trouble. Human capital has deteriorated to a dangerously low level in my view. I hate to end my piece on a negative, bureaucratic note but—

Launius: Well, let me ask you one more question then.

Estess: [Yes]. But I'll tell you some other thing that bothers me. Our federal government is more interested in—I don't know. I don't know whether I even [know] how to complete [this]. But we came to work and worked twelve hours a day. We went to meetings at three o'clock in the morning to get things tested, to get to the Cape to fly to the moon. And now we have a hard time getting youngsters who want to test rockets on Saturday. We have people who want to get off every other Friday. They want to have—their objective is to figure out how to get off, not how to get on. We have to sort through a lot of people to find the dedication and commitment to really get the job done. The federal government has got too many mamby-pamby lax rules that are put in for other purposes. We need to allow NASA to return to the high standards of yesteryear. And there's either two, there's only two options in my view. Either you have a high standard of work performance and commitment in the federal government or either you contract it out to the private sector and let them do it and they don't have all these rules we've got. I'm telling you that it's easy to work for the government now. And you can get off every other Friday and you can come in at nine, you can leave at four. And that's OK, but I used to tell my wife, "I know the recital's at six o'clock tonight. We're about to test this rocket and I can't be there. You go to the recital." She says, "The recital won't come [again] for another six months." "I know it won't come for six months, but I have [a] responsibility [in testing] this rocket. Bye." That's what it took to get to the moon.

Launius: Right.

Estess: And I don't—it's hard to find people that are willing to do that now.

Launius: Yeah, well, there's a couple of issues there. One is, society's changed.

Estess: Society's changed.

Launius: No question about that.

Estess: Right.

Launius: But there's another one, and you kind of you just hit upon it a moment ago, that there was this exciting, *really* exciting mission that everybody was going whole-hog to finish.

Estess: Right, absolutely.

Launius: And we're kind of in a treading-water mode at some level.

Estess: Well, don't end my session with that bureaucratic stuff.

Launius: I understand. Well, you had a wonderful kind of summation there before this, before I asked you this human capital question. Anyway, thanks so much. I appreciate you sitting down and talking to us.

Estess: Thank you.

(end of the interview)