

**NASA JOHNSON SPACE CENTER ORAL HISTORY PROJECT  
ORAL HISTORY TRANSCRIPT**

ROBERT C. GOETZ  
INTERVIEWED BY SANDRA JOHNSON  
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JOHNSON: Today is March 12<sup>th</sup>, 2003. This oral history with Robert C. Goetz is being conducted for the Johnson Space Center Oral History Project in Friendswood, Texas. Sandra Johnson is the interviewer and is assisted by Rebecca Wright and Jennifer Ross-Nazzal. Today's session will focus on his career with NASA at JSC between 1983 and 1987.

I want to thank you for participating today with us. You joined JSC in July of 1983—

GOETZ: Well, I actually came down in April.

JOHNSON: In April?

GOETZ: In April of '83. For one of the launches.

JOHNSON: When you came in April, did you start your position then?

GOETZ: No, I didn't start. I went back and then came back down in July.

JOHNSON: As the Deputy Director at that time, under Gerry [Gerald D.] Griffin.

GOETZ: That is correct.

JOHNSON: You also were still attached to [NASA] Langley [Research Center, Hampton, Virginia] at that time?

GOETZ: That's correct.

JOHNSON: How did that work, having that dual assignment?

GOETZ: That worked fine, as I remember it. I went back a couple of times, but it worked very well. In fact, Hans Mark, who sent me to JSC, sent me down with about three different goals in mind. One was to get experience on the Space Shuttle operations. The other was to start Space Station, and to get a leading role for JSC in that endeavor. So that was pretty simple, and I thought that by coming down for a space launch, that I would start on the first of those goals. He was a Deputy Administrator at that time. I think James [M.] Beggs was on a leave of absence. He was the Administrator.

JOHNSON: When you came down here, did you still maintain duties at Langley or were you still—what were you doing? You said you went back and forth.

GOETZ: Well, between April and July, and I still maintained duties [as Director of Structures]. I wasn't officially sent down here until July.

JOHNSON: How prepared do you feel you were to take over the Deputy Director position at that point in your career?

GOETZ: Well, that's an interesting question. How prepared was I? I don't think I was really that prepared. I was going into a new culture, a new Center, and I didn't realize how much that entailed. You know, I'd risen up as far as I could go, except for Director or Deputy Director at

Langley, so coming to JSC was kind of natural, but I didn't realize at the time what it entailed. That's the best way to put it.

JOHNSON: You took part in the [NASA] Headquarters Executive Program at NASA?

GOETZ: Yes.

JOHNSON: Did that help you at all with this transition?

GOETZ: Not really. [Laughs] No. It's one thing to learn out of books and a lot of the theory involved, and even, you know, to take small exercises, but to actually live through it is something different.

JOHNSON: Can you explain to us some of your day-to-day activities when you first came here and what your duties were and how they were explained to you?

GOETZ: Well, [Gerald D.] Gerry Griffin was a good boss. He more or less said that what he did is what I would do and watch him, so anything that, you know, he decided to let me do, I would do, which kind of entailed mostly, you know, meetings and so forth.

JOHNSON: Did you have anything to do with mission planning or any sort of connection with that?

GOETZ: [Yes].

JOHNSON: You mentioned that Hans Mark wanted you to get experience with the Shuttle Program.

GOETZ: Yes, operations.

JOHNSON: How did you go about doing that?

GOETZ: Well, I was in the Mission Control room, or either at the Cape [Canaveral, Florida] for a launch and then back here, throughout the whole mission, except for when I went home to sleep, and I watched all the controllers in the Mission Control Center. We were in Building 30 at that time. I went to the backup rooms and saw what they did. So it was more or less learning on-the-job training.

JOHNSON: Was that interesting to you?

GOETZ: Yes, it was very interesting. In fact, that really made the time whiz by.

JOHNSON: I know when you were at Langley, some of the work you did was with the tiles and that sort of thing. Did that have any bearing on this job?

GOETZ: Oh, absolutely. In fact, I was at Rockwell [International Corporation] for like six weeks in 1980, when all the tiles fell off the 747 ferry flight. We were part of the team that was headed by Phil Glenn of JSC at that time. We had [come] from around the country, various structural people, structural dynamicists, and we solved the problem. You know, the densified tiles are the result of that team's efforts.

JOHNSON: What was the relationship between the JSC administration and other parts of NASA, the flight controllers, the engineers, managers, that sort of thing? You were talking about the culture earlier.

GOETZ: Well, that's another interesting question, because the [fourth] reason I was sent here, I think—this wasn't stated at the time—was to bring some of Langley's culture to JSC. JSC did not get along well with [NASA] Marshall [Space Flight Center, Huntsville, Alabama] at the time. As you remember, at the time I was here, that was while we were doing Space Station and we had the work-package breakdown, and there was a lot of fighting between Centers on the work package—who got what, so to speak. So I think I was, you know, kind of sent here to help soothe that.

JOHNSON: From what I've read, that was one of the things that you really advocated, was that intercenter cooperation.

GOETZ: That's correct, yes. In fact, when we started Space Station, I had a retreat over at the Planetary Science Building, or what was then the Planetary Science Building on NASA Road 1. We had mostly attendees from the other Centers. We initially set up to do Space Station, to do a baseline the first year, in [19]'84? Yes, I think it was '84. We ran it off-site. We stocked it with computers. We had 200 people there. We had 100 from the various Centers and 100 from JSC, and we came up with a baseline at the end of that period of time, and that's when we went out with contracts to have these work packages that I mentioned earlier.

JOHNSON: Maybe you can explain some of the processes that you went through to come up with those ideas and to work through that process.

GOETZ: Well, we started with this retreat and we set out—in fact, I used to have a board that we scratched on, and we set out to set up an organization and a goal and so forth. That took about three days, with all these people, you can imagine.

After that, the process went pretty smoothly, and Neil [B.] Hutchinson was the Project Director at JSC. He was over at this building I mentioned earlier, and he did a good job. Now, when it got down to the work package era, which was much later, [19]'86, that's when both Centers really dug their heels in and each wanted to essentially be lead, and so there was a lot of give-and-take in that.

JOHNSON: How did you help to smooth over that?

GOETZ: Well, I was for JSC, myself. [Laughs] So I didn't probably help in smoothing that over as much as I could have. Plus, I had the Shuttle *Challenger* [accident] at that time, and my boss had quit, so it was kind of a hectic time.

JOHNSON: In that process, do you feel like there was an agreement that was eventually reached as far as the Space Station, at that time, not later on, but at that time, in the middle eighties, the two had that cooperation? Do you feel like it was ever actually achieved?

GOETZ: Not in my tenure. I think Aaron Cohen took over the Center in October in [19]'86, and I think he achieved that.

JOHNSON: Since you mentioned it, let's go ahead and talk about the *Challenger* time, and, as you said, there were a lot of changes going on. In the years prior to *Challenger*, the remote sensing program was phased out. You lost Glynn [S.] Lunney, Hans Mark retired, William [R.] Graham came into the picture, and then James Beggs was indicted. Then on January 14<sup>th</sup> [1986], Gerry Griffin retired and left you somewhat in charge for a couple of weeks as the acting director. Then just a few days before the *Challenger*, then, of course, Mr. [Jesse W.] Moore was—

GOETZ: He was in Headquarters, came down.

JOHNSON: Can you tell us about that period of time and how those changes and those fluctuations affected the Center prior to *Challenger*, and give us an idea of what the feeling was and how it affected you in your position?

GOETZ: Well, I was devastated from *Challenger*. The only trouble we'd had on the launch pad was ice off the tower coming down. That was deemed to be acceptable, so we went, and even though—I was not aware that there was a ring problem in the solid boosters. I can remember that I was in Mission Control Center when it launched, and I was on the phone in that little room, the glass room with the President's office—I assumed [it] was the President's office,—oh, most of the day. It was a long period. And that's when we lost control, because the President [Ronald Reagan] said he was going to set up this commission, and so forth and so on. We had an Acting Administrator, who was Bill Graham. He was on vacation at the time. I couldn't get a hold of him. So, you know, what could I do?

JOHNSON: What did you do?

GOETZ: Well, I stayed on the phone and listened, primarily. They did most of the talking at their end. They set up this [Presidential] commission [over my objections]....

JOHNSON: What were your actions immediately following the accident? What did you have to do?

GOETZ: Well, the first thing was to shut down all the data to make sure that it was locked up, which is the primary administrative duty that you have to do. Then we set up teams that went out and investigated what could possibly—in fact, in two weeks we had a perfect scenario, computer simulation, of what happened. There was a meeting at Headquarters—I think Bill Graham chaired it; I'm not sure about that—but all the Center Directors were there, and they went around the table

with the question on the floor being how long should we be down? I remember General Lew Allen [Jr.] from JPL [NASA Jet Propulsion Laboratory, Pasadena, California] and myself were the only two out of all the Center Directors that said let's launch within as long as it takes to put a bellyband around that joint, and they wouldn't accept that.

So, as far as the accident went, I was devastated. They had reporters at my home interviewing my six-year-old. I was kind of devastated is the only way to put it.

JOHNSON: Were you involved in any other public relations activities immediately following it? Did you have to give any statements?

GOETZ: Well, to the press, but I didn't testify in Congress. Let's see. Glynn Lunney and—there was another fellow that was here, who was head of the Space Shuttle Office [Arnold D. Aldrich at JSC]—[Jess] Moore, who was head of the Shuttle office in Washington. But they all testified in Congress. I did not testify.

JOHNSON: To what degree were you involved in the investigation?

GOETZ: Not as much as I would have liked. I went around and saw—I had reports coming to me on what happened. I had cut off the press at that time. I was interviewed by [Samuel A.] Sam Nunn from—I guess he was Senator from Georgia at that time, plus [Dole] Meyers, who had been with NASA earlier.... In fact, Sam Nunn came on a Saturday and I had that interview in the office in Building 1. That was a lengthy stay.

JOHNSON: Can you tell us about that at all?

GOETZ: No, I'd rather not.

JOHNSON: Okay. Did you have any contact with the Presidential Commission?

GOETZ: Only the ones that were from JSC. Sally [K.] Ride was on that commission, as well as others. They were helping out, so we tried to provide them as much help as possible, but I was not called to testify before them or anything.

JOHNSON: What about the atmosphere at JSC as far as everyone else in trying to get people motivated and get over this problem?

GOETZ: The morale was extremely low, as you can imagine. Everyone was devastated. There was nothing going on except Space Station, which was just starting out, because it was almost three years that Shuttle was down. So the morale was very bad. There were a lot of people leaving. The job was to retain people, to be frank with you, and to motivate them, and we tried to do that with new programs and so forth, but it was pretty tough to do.

JOHNSON: What types of new programs?

GOETZ: Well, Space Station, primarily. We went through a planning exercise right after *Challenger*, from [19]'86 to [19]'87, and as I remember, we had Shuttle, Space Station [and] advanced programs. There was a lot of things in the advance programs that were new programs and so forth, trips to Mars, the Moon, etc., that we hoped would motivate the people, and we actually started some of those. That was done under a fellow that died. Bill [William J. Huffstetler]—he was a nice young guy, too. He died of a heart attack.

JOHNSON: Do you think that—or maybe, if it did, how the *Challenger* accident affected the Station Program?

GOETZ: Well, I think it affected it a great deal, the way it came out. I think JSC was destined to be lead had there not been a *Challenger* accident. As it turned out, I think Marshall gained the majority of the lead. The work packages they got were really the guts of the whole matter. I think JSC's in big trouble right now, the reason being is because prior to now, Marshall had gotten the next-generation launch vehicle for manned space flight as well as for unmanned. Well, that just put JSC in the operations game. I think that's a mistake. JSC's got to be on the cutting edge of any new launch vehicle as well as the operations of same.

JOHNSON: Immediately after the accident, you implemented NASA's accident contingency plan?

GOETZ: Yes.

JOHNSON: Can you tell us about that decision and why it was you that did that?

GOETZ: Well, it was just a natural thing to do, you know. I'm wondering what the heck to do, first, and the very day of the accident, as was told to me by [Eugene F.] Gene Kranz, who was in the Mission Control Center, and so I did it. There wasn't any decision to be made, really. It was already in place.

JOHNSON: Where was Mr. Moore during the accident?

GOETZ: During the accident, I don't know. He was in Washington [D.C.] at the time, but I don't know where he was during the accident.

JOHNSON: Did he stay in Washington for a while or did he come down here?

GOETZ: He stayed for a while in Washington and then he came here—I can't remember what the date was, but in mid-summer. Two or three months later.

JOHNSON: So were you Acting Director during all that time?

GOETZ: That's correct.

JOHNSON: He didn't do it remotely?

GOETZ: Correct.

JOHNSON: You were the Acting Director. Okay.

Let's go back for a moment prior to that and talk about some of your other duties as Deputy Director. You represented JSC as an Equal Opportunity Council member?

GOETZ: Yes.

JOHNSON: Can you tell us about some of your experiences on that council and some of the progress during the time you were there?

GOETZ: I can't remember some of the progress, but we did make good progress, I remember that much. I made a speech at each of the annual meetings, and there was about four or five of them. We set goals for the Centers. I think we did fairly well in that area.

JOHNSON: I also read that you created a Center Automatic Data Planning [ADP] Steering Committee.

GOETZ: I might have.

JOHNSON: You don't have any memories about that? I think it was to review the current and future ADP requirements to reduce costs. Was that just part of your general duties?

GOETZ: That was part of the regular duties, yes.

JOHNSON: The Center construction of facilities planning process.

GOETZ: Yes, that was an interesting one because Gerry evidently wasn't interested in that, so I went to Headquarters a couple of times and advocated a number of new buildings and different changes at JSC. That was a very rewarding experience, not only dealing with the people in the other Centers and in Headquarters, but in getting the information from the people around JSC.

In fact, the first thing I did when I got here, in July, was I took a tour. It took about [three] months and I went and spent hours at each organization. They told me what they did and so forth, and that was very helpful when it came time to see what their needs were as far as facilities went. So I thought that was a very rewarding part of my time. In fact, some of it didn't come to fruition until I'd left, in [19]'87, '88. In fact, I don't know where it is right now, but the long-range planning guide, too, came out after I left.

JOHNSON: You had a part in that?

GOETZ: Oh, yes. Yes, I was chairman of that. They sent me a copy of the brochure. It was very nice.

JOHNSON: What sort of buildings did you advocate building and what type of changes did you make before that?

GOETZ: Well, let's see. There was a Thermal Protection Facility, TPS. I don't know if it was arc jet or what, but I remember advocating that for a couple of years. Didn't make it the first year and then it did the second. I can't remember all the facilities at this point in time, but there was an antenna facility and there was a WETF [Weightless Environment Training Facility] and so forth. We tried to keep the facilities actually going, and we got our share of the overall budget for the years that I was involved.

JOHNSON: While you were there and as part of your day-to-day activities, did you have anything to do with the astronaut selection coming in during that time?

GOETZ: No, not the selection of the astronauts at all. I didn't have anything to do with that.

JOHNSON: What about the budget, in dealing with NASA's and JSC's budget during that time period?

GOETZ: Well, the budget at that time was \$2 billion, I remember that, and I was very much involved in the budget allocation and how it was spent, and advocating for the budget at Headquarters, both at the Shuttle office as well as Code R [Office of Aerospace Technology] and Code S [Office of Space Science], [and] some of the other offices up there, so that took a great deal of my time, actually.

JOHNSON: Manpower planning or procurement?

GOETZ: Manpower planning and procurement. In fact, I was the Procurement Chief for several awards and said what the various subcontractors and contractors would make for a given period

of time. They were evaluated by committees, and then I was the Award Chairman or something. I remember doing that.

JOHNSON: Anything else come to mind during that time, prior to *Challenger*, that you'd like to mention?

GOETZ: No.

JOHNSON: How do you feel the *Challenger* affected your career with NASA, if at all?

GOETZ: Well, I left NASA in [19]'87. So I had made the decision to leave when Aaron Cohen became Center Director. I resigned that day and he said, well, he would replace me, but if I wanted a year to look for a job, I could. So I did. I put out a lot of résumés, and had three in Los Angeles area, and decided to go with the least [money] of the three, because it was all mostly aeronautics. It was the Skunk Works at Lockheed [Aircraft Corporation] at the time. So that's where I went.

JOHNSON: What led to that decision to leave NASA?

GOETZ: Well, I think *Challenger* had a great deal to do with it. Plus, I didn't get the Center Director's position. But I think *Challenger* had a—I was in a very bad state of mind at that time.

JOHNSON: Which is perfectly understandable, after an accident and having to go through what you did.

GOETZ: Well, it was interesting. When we had a memorial and President—at that time—[Ronald] Reagan came down and spoke, Bill Graham came down, but his wife took care of

making all the arrangements. That was kind of strange, I thought. They operated out of my office up on the eighth floor of Building 1. But that was a trying experience, just arranging the whole memorial and the fly-by, etc., and setting it up. He gave a very excellent speech, I thought, and we had everybody there, but I just thought it was very strange that Bill Graham didn't take a more active role in it.

JOHNSON: Did you actually arrange the memorial service yourself?

GOETZ: Well, myself and his wife.

JOHNSON: The two of you together. Is there anything else about that time period that you'd like to talk about?

GOETZ: Not that I can remember right now. I kind of block it out of my mind.

JOHNSON: Which is understandable. Why don't we go back to some of the earlier part of your career. You started working at Langley right out of college?

GOETZ: Yes, that was interesting. Well, right out of college I went to Lackland [Air Force Base] here in Texas. I was in Air Force ROTC [Reserve Officer Training Corps], as a pilot. Well, I wore—I still wear glasses. I'm near-sighted. At that time, you had a five-year commitment, and you had to be either—if you had glasses, you had to be a bombardier or [navigator]. I said, "No, that's not for me. I'm going to revert back to research."

So I'd been offered a job at Langley in the meantime, and I accepted it, but my orders in the Air Force sent me to Wright-Patterson [Air Force Base, Ohio], so Langley had to scurry around and get me assigned there as an Air Force detailee. So that's where I went in July of 1959.

When I reported to duty there, I was supposed to report to the Space Task Group. In fact, you can see the picture up there on the wall with the original seven astronauts, signed. That's my wife's. She was the secretary—she took care of all the leave and administrative duties for the astronauts.

But, in my wisdom, I'd heard they were going to Florida. This was July '59. So I didn't report over there; I reported on the other side of the field at Langley in the research area, hypersonic [aeroelasticity] research. I came down to Houston in [19]'62, when they were flying people down to check it out, and there wasn't anything but cow pastures out there where the Center is today. And, you know, I just didn't come. I was working with a guy that did. In fact, I wrote my first report with him. It was a classified report, so I can't speak about it. But he came down here. [John C.] Jack Stonesifer. He was in recovery. He came in '62, I remember that.

JOHNSON: So I imagine it looked quite different from that first view of it, and then when you came back in [19]'83.

GOETZ: Oh, yes. Well, I'd been back at least once prior to that. In [19]'72, I was on a Shuttle Technical Evaluation Board, and there was four bidders, and it took us six weeks. It was the only time that I ever got overtime working for NASA. Let's see. Who was the Center Director at that time at JSC? Not [Maxime A.] Max Faget. His boss.

JOHNSON: [Christopher C.] Chris Kraft [Jr.]?

GOETZ: Chris Kraft. He was from VPI [Virginia Polytechnic Institute and State University, Blacksburg, Virginia]. He arranged to have us all get overtime for the Saturdays and Sundays and holidays we worked during that six weeks. And we worked like one holiday—[Memorial Day]. But, that was an interesting scenario. None of the four flew, on a computer. The reason that one won was because of past experience, Rockwell. They weren't the lead technically or

low cost. Then after they'd picked a winner, then they took the best of all four of them and put them together and made a new base line that flew. That's kind of an interesting scenario.

JOHNSON: It is very interesting.

GOETZ: That was in [19]'72, which was about nine years before the first flight, [19]'81.

I graduated with [Richard H.] Dick Truly [who flew on that flight. The other astronaut on that flight was John W. Young].

JOHNSON: Oh, really.

GOETZ: [Dick Truly became] an Administrator of NASA.... He was an astronaut—well, he had left, I guess right before I came, or shortly thereafter. He's an interesting guy. He was a rear admiral in the Navy, but we both graduated from Georgia Tech [Georgia Institute of Technology, Atlanta, Georgia] in [19]'59. He was the head of the Navy ROTC and I was the head of the Air Force ROTC, plus, we were both AEs, aeronautical engineers. There was only thirty-five of us that graduated that year, '59. He was one. He's done quite well. I lost track of him after he went to Colorado and he was head of some DOE [United States Department of Energy] research outfit, then I lost track of him after that.

JOHNSON: When you first began at Langley, what exactly were you working on for those first few years?

GOETZ: The first few years I was in hypersonics [aeroelasticity]. I was working in a wind tunnel, a series of wind tunnels, as a matter of fact. But mostly out of a helium blow-down tunnel, and we were experimenting with far-out stuff. I worked on a variable [-swept wing]—

did subsonic, transonic, supersonic variable swept-wing flutter study. It was one of the reports I wrote. That was interesting. That was one the first things that I did at NASA.

JOHNSON: Can you explain a little bit of what a flutter study is?

GOETZ: A flutter study—we ran a wind-tunnel program in three different tunnels, and we tried to find the flutter points. In other words, there's a flutter index parameter versus Mach number, and we plotted it over the whole Mach number range from subsonic, transonic, to supersonic.

JOHNSON: In [19]'67, you went back to get a master's degree?

GOETZ: Yes, at VPI. Well, I actually went in [19]'63, [19]'64. I got my degree in '67. I took a thesis route, so I wrote a thesis and it took several years for me to write it. But I was actually there in '63 and '64, in Blacksburg [Virginia].

JOHNSON: What prompted you to do that?

GOETZ: I was bored more than anything else. Also, I was twenty-six, and I just figured that I needed to go back to school. I went up there in aeronautical engineering, and they only offered two courses in aeronautical engineering, the next semester, so I walked across the street and transferred to engineering mechanics, and that's what I got a degree in. But I took most of my—air elasticity, hypersonics—most of my electives in aerospace.

JOHNSON: You also worked on the aircraft tire and breaking problems on wet runways? Is that true?

GOETZ: Well, in [19]'71, I became a section head of the Flight Load Section. In [19]'73 or [19]'74, I became a branch head and then I became a Director. I skipped the division level, became a Director. One of the parts that was under me in the branch and the directorate was the Landing Loads Track, at Langley. They did the grooving at the Cape, and so forth, for Shuttle. They're a very renowned group. They were on every U.S. domestic aircraft accident investigation, because they had a little car that would go down the runways in damp and wet and icy conditions and measure the friction. So, yes, I was in that group, but, I mean, that group was under me.

JOHNSON: Did you also plan the Space Shuttle Approach and Landing Tests, or have anything to do with that?

GOETZ: No, not really.

JOHNSON: In [19]'79, you went to NASA Headquarters, as we mentioned earlier.

GOETZ: Right.

JOHNSON: How did that come about, or that opportunity happen?

GOETZ: That was some kind of a training program. I went up there for a year, worked in Code R. I was Manager of Structures [Division] for one year. I don't know how it came about. I got called in by the Center Director, saying he wants me to go to Headquarters, "This is a steppingstone," etc., etc. So I went. I had just moved into a new house, so I rented the house and went up there and lived in Reston [Virginia], which was way out. But I found that the cost of living in Washington, D.C., is directly proportional to the distance that you have to travel. So

I was almost out to [Washington] Dulles [International Airport] before I could find a place that I could afford.

JOHNSON: So what were your duties in that position?

GOETZ: They were primarily to advocate, to get monies out of Code R, out of Code R's total budget, for the Code R program at the various centers. So that's what I did, primarily, for the whole year, is advocate. We spoke to Congress, made presentations. Tried to get more money, is about the easiest way of putting it, and then allocate it to the Centers. Most of it went to Langley, Lewis [NASA Glenn Research Center at Lewis Field, Cleveland, Ohio], and [NASA] Ames [Research Center, Moffett Field, California], because they were the Code R Centers at that time, and, well, [NASA] Dryden [Flight Research Center, Edwards, California].

JOHNSON: Did you play a role in the Technology Readiness Assessment during that time when you were at Headquarters?

GOETZ: Technology Readiness Assessment?

JOHNSON: For the Shuttle Program.

GOETZ: Oh, no, no.

JOHNSON: Okay. Was that when you were back at Langley?

GOETZ: That was before I went up there. Yes, that was an interesting few years. I forget the years that was, but that was quite a bit before I went to Headquarters. The Technology Assessment Committee culminated in a meeting at Lewis, which is now Glenn, where they

presented all the material and voted whether it was ready or not. Everybody thought they were ready. It was unanimous. It was in winter, I remember, in Lewis, because there was a lot of ice on the ground, and snow, and when we took off in the NASA plane, we were heading down the runway and we skidded sideways. So then the pilot said, “Well, we’re going to go around and try again.” [Laughter] And let me tell you, that time, we held on, but we made it off all right.

There was another guy, Harry Runyan, was head of the Technology Assessment, and he retired and he left it to a fellow, David Stephens, who was an up-and-coming young guy out of Stanford Sloan [Program], and he was in an automobile accident. So I was in the right place at the right time, or something, so I got it, made a presentation and so forth, and went from there.

JOHNSON: Can you tell us about that process, the assessment process?

GOETZ: Well, it was run from various—let’s see. Headquarters headed it up. There was teams of people that went across the Centers. Some were at Langley, some were at JSC, some were at Marshall, [Ames, Glenn,] some were head of them, but each of the teams had on them people from all the Centers. Each of the Centers did something, whether it was a wind-tunnel test or analysis, to see if the technology was ready for Shuttle. We at Langley did a lot of flutter studies, ground wind-load studies. That was the structural dynamics part. In the structures part, they did a lot of TPS, tile work and the arc jets, and so forth, panel flutter, and so forth. Max Faget had a straight-wing orbiter at that time, so that’s what their baseline was. It wasn’t until much later that we got what’s presently the orbiter.

So we went through and did various technology assessments of the various configurations in each of these groups, across the board. Then they’d meet, oh, I don’t know, about once every four months or six months, and report their findings. Then they put out monthly reports. I remember that. That’s how we got to the Space Shuttle. That was a long process. That was about five [or] six years.

JOHNSON: Did it begin in the early seventies or mid-seventies?

GOETZ: Well, yes, it must have. It must have been during the seventies sometime, because—well, in [19]'72, we had a technical evaluation, so it was the late sixties and early seventies. Then I went to Headquarters in [19]'79, so it had to be early.

JOHNSON: After you came back from Headquarters, you were the Special Assistant to the Chief of the Structural Mechanics Division at that point.

GOETZ: Oh, that's right, yes. I forgot about that.

JOHNSON: What were your duties in that position?

GOETZ: Well, most of the time I was out at Rockwell doing the Shuttle problem, where [the tiles] all fell off. In fact, that was about the whole thing I did there. I didn't have any—"duties as assigned"—from Roger Anderson, who was the Division Chief. I think that was just a holding pattern.

JOHNSON: Tell us about the TPS system and your work with that and the final clearance for STS-1.

GOETZ: Well, when they all fell off, we were devastated, obviously. It took about six weeks to find out that the concentrated loads were taking place at the SIP [Strain Isolating Pad] line. In fact, I used to have a tile. Anyway, by densifying that white side—and the coating was on the black side—by densifying the white side, you spread the loads out, and then it would adhere better. So the RTV [room-temperature vulcanizing silicone adhesive], which was spread on the aluminum and then the tile attached to that, was very strong after that.

For STS-1, there was a pull test done at the Cape. Obviously, there couldn't be any cracks in the coatings or anything like that. In fact, I was an advocate, and still am, of a more durable system, like a metallic system, which we studied back in the technology days, and that's been proposed since, but it's very expensive because you have to have standoffs, and you have to be able to lay these tiles so they grow at the heat cycle. They grow and contract. It's very difficult to do.

The X-33 [reusable launch vehicle] was the first example of when it was done. Then they had the hydrogen tank explosion at Marshall on that, which I was chairman of the investigating committee, and we found out the cause, wrote a report, and it's been buried. NASA, in their wisdom, cancelled the X-33 program, where they could have put a liner in the tank. It had a metallic TPS system on it. It had an Aerospike engine on it. It looked sort of like this right here. Single-staged orbiter. Took off [vertically] and landed [horizontally], seven-day turnaround. But they cancelled the whole thing, after spending a billion dollars.

JOHNSON: What was the cause of the explosion.

GOETZ: Porosity in the composite tank. That's why a liner would have fixed it, and you could have taken the weight out somewhere else. In fact, that's the way the report wrote, but they buried the report, or they didn't put it out for a long time, and when they did put it out, they'd already made the decision to cancel it. But that, to me, was the way to go. More durable.

JOHNSON: Tell us about STS-1. Were you able to see the launch?

GOETZ: No, I didn't see the launch—well, I saw it on television. I didn't see the launch of STS-1 at all. I was at Langley. This was [19]'81, so it was a couple years before I came down here.... This has all the things while I was at JSC, all the launches, except for the first five. One, two, three, four, five, then I started with this one. I think that was in April.

JOHNSON: What did you do after the STS-1 launch, during that time period and before you came to JSC, at Langley? What were your duties?

GOETZ: I was the Director of Structures. Structures at that time was made up of Structures, Materials, Acoustics, and Aeroelasticity Divisions. Four divisions. So it was about 400 people, and we had—I don't know what the budget at that time was. But that's what I was doing between [19]'80 and [19]'83.

JOHNSON: Having worked at Langley for almost twenty-five years, and you did mention the difference in the culture between Langley and JSC, maybe you can explain a little bit about those cultures and tell us what the differences were.

GOETZ: Well, the culture at Langley was one of, you did far-out work, not near-term work, and it was much more researching. JSC was much more near-term, operational, and so forth, except for Space Station. It was interesting. We started Space Station in [19]'84. It was supposed to be \$8 billion. They stopped counting after twenty. It just went wild. While I think that that was good for JSC and a growing experience, I think it was not so good in other ways.

JOHNSON: You mentioned that one of the objectives of you going to JSC was to bring some of that culture. Do you feel that you accomplished that objective?

GOETZ: Well, we started Space Station, and while I was here, at least, we made progress. It wasn't till after I left that they went after the work packages and Marshall got control.

JOHNSON: Moving into those management roles, as an engineer—and you worked as an engineer for several years before you started moving into that—how did you adopt your management style, and what is your management style?

GOETZ: What is my management style? Well, I guess I like a lot of participation, so I think I'm a participant manager, where I kind of gather people and let them do their own thing and, you know, guide them, set policy and so forth, but let them figure out how to do it. Actually, people don't realize it, but when JSC started in [19]'62, the average age was in the twenties. Now it's way up there. I won't even guess, but it's pretty far up there. So it's aging, and I think that's a shame, because the other centers aren't like that, except maybe for Marshall.

JOHNSON: Did you have any issues coming from an engineering background into management?

GOETZ: Not really, no. It was a natural progression. I went from section to branch head and on up. I think I learned as I went. I think, if you remember Management 102, it has four things: planning, execution, organization, and control as the four things. I think as you get higher in the organization, the planning gets more, the organization gets slightly more, the control is decreasing, and execution is decreasing [a lot]. So I think that's kind of what you've got to know to step in from an engineering, where you do all of it yourself, into something higher, in management.

JOHNSON: You worked under a lot of different directors, both at Headquarters over everything, and then at JSC and at Langley. Any specific memories about any of them?

GOETZ: Well, I think [Donald P.] Don Hearsh was probably the best. He was the Center Director at Langley. Gerry Griffin was excellent as Center Director at JSC. They were very similar. They pretty well let you do your own thing, and that's kind of what I patterned myself

after. The rest of them, like Roger Anderson, he was [unpredictable], and I could go on and on and on, but that's the two that stick in my mind as being the best.

Don Hearth retired shortly after I left Langley, and he went to Colorado, in Boulder—I don't know if that's Colorado State or the University of Colorado—heading up some space institute or something. He was from Grumman [Aerospace Corporation] originally. He had brought down this fellow as Deputy, when he became Center Director, who was at Texas A&M [University, College Station, Texas]. He's probably retired now....

JOHNSON: After you left JSC—going to that time again—you said you went to the Lockheed Skunk Works.

GOETZ: That's correct. In Burbank [California]. And that was the lowest-paying job that I had an offer from. I only had three out of five offers [in California]. [McDonnell] Douglas [Corporation] in Long Beach [California] offered me one, [Northrup Grumman Corporation, Skunk Works, and] Boeing [Company] in Seattle [Washington]. My wife didn't want to go to Seattle because it rains too much, so we decided on Los Angeles. You've got to remember, Los Angeles, the cost of living is about three times higher than here, so we had sticker shock for the first six months. But we stayed there from [19]'87 to [19]'94, then we moved in 1994 to Palmdale [California], where Lockheed owned all of its own facilities, and we became a company.

Then they bought GD [General Dynamics Corporation], then they merged with Martin [Marietta Corporation]. I stayed in the same position the whole time, but it was kind of traumatic. Then we went through a year—we were going to merge with Northrup Grumman [Corporation], but we didn't, because the government wouldn't let us.

JOHNSON: What was your position?

GOETZ: Vice President of Engineering.

JOHNSON: I have a couple more questions, but before I get to those, I thought I would see if Rebecca or Jennifer have any questions at this time.

GOETZ: Okay.

ROSS-NAZZAL: I just had a general question. You worked for NASA for some time, and you also worked as an EEO [Equal Employment Opportunities] officer. I was wondering if you could talk in generalities about how treatment of or perceptions of minorities and women changed at the Centers over time. If you could talk about that, the hiring.

GOETZ: When I graduated from college in [19]'59, I went to an all-boys' school, Georgia Tech. And now, today, Georgia Tech is 50 percent women and 50 percent men, roughly, and it's not that much bigger, really. I guess it was 6,000 to 12,000, so it gained 6,000. The first two women graduated in my class in '59, but they had transferred in as upper students. So I've seen, from '59 till today, a great change in both government as well as industry, in females and minorities. I think that we've got to diversify in order to stay ahead of the technology. I think there's not enough people if you just look at the men, so you have to go for minorities and women in order to continue to grow.

Everywhere I went, first it was quotas, which I wasn't against, but then they did away with the quotas and so forth, and it's still going on in great strides, and, I think, rightfully so. So I think in the last fifty years, it's really come a long way. You've heard the commercial, "You've come a long way, baby." [Laughter]

ROSS-NAZZAL: I had another question. You mentioned the densification process, and you had mentioned that there were several ideas that were floated in the early seventies. When you came

across this problem with the tiles, right before STS-1, were there any attempts made to change the tiles and use one of those other processes that engineers had designed, or at least conceptually designed on paper?

GOETZ: Not really, the reason being you had to freeze in time the technology and choose it in order to build it, because it took so long. They thought they were building a robust system. When they didn't and had to densify, go back and densify, that was the white side of the tile, where you glue it on with RTV, that took about a year. So while there was a number of stronger, if you will, lighter—in fact, that was the reason why they picked ceramics over metallics, weightwise, they were about equal, but they thought that the ceramics as a technology was further ahead. That's really why they chose it. I think that was a mistake, in looking back at it, but I probably voted for it.

ROSS-NAZZAL: Can you tell us how the process of densification came about?

GOETZ: I don't really know—well, I forget how many people were on the committee now, but they were working with Rockwell folks at Downey [California], for six weeks, so it was a combination of the Downey folks coming up with this densification as well as the team. So, you know, it was hard to decide whose the actual idea was.

ROSS-NAZZAL: Okay. Those are all the questions that I had. Thank you.

WRIGHT: I just had one. It goes back to the time when you were at JSC and Gerry Griffin announced his resignation. Between that time and the time that Aaron Cohen came on board, you were in a very volatile position because you were in the midst of these Center Directors, but yet had lots of responsibility due to the events that were occurring during that time period. Could you just share with us about those times, about how you were able to work those

transitions for these Directors so that they were able to take on those jobs and maybe the difficulties of you trying to do your duties as well as helping them come on board?

GOETZ: Helping them come on—you mean like—

WRIGHT: Like Mr. Moore coming in.

GOETZ: Mr. Moore coming down?

WRIGHT: And then Aaron Cohen moving into that position as well.

GOETZ: Well, as far as Aaron Cohen moving into position, he moved in to Moore's position. Jesse Moore left the agency and went with someplace in Colorado. Ball Industries. He was kind of—I felt sorry for him, because he was in Headquarters and came down here as JSC Center Director, so we threw a party for him and tried to welcome him, and so forth. He was under a great deal of strain, no doubt about it, but we did everything we could to make him comfortable.

I think they made a big mistake. They brought him down here, he bought a house, and then they fired him. So I think the agency made a big mistake. They should never have transferred him down here and let him buy a house and everything before letting him go. Now, those were the times—I can't remember. He came down in the summer sometime and he was only here for like two months.

WRIGHT: During that time, basically the weight of the Center operations was on your shoulders to continue?

GOETZ: Well, up until that time, I'd been Acting Director, and so I tried to help him in all his daily duties. Aaron Cohen kind of came up as a surprise to a lot of people. He was head of

engineering at the time; he was like a Vice President. And while he had been very active in Shuttle. He had not been active in Space Station, so I don't know if that had anything to do with it or not. But he came on all of a sudden, in October of that year, [19]'86. So I didn't help him at all. He'd been right down the hall, so he knew the ropes, knew what was expected.

WRIGHT: Were you surprised to hear that Gerry Griffin was leaving, or he had talked to you about that?

GOETZ: No, I was just as surprised as everybody else. He actually went with the Chamber of Commerce of Houston when he left. I thought it was 1 January instead of 14 January, but I could be wrong. It seemed like it was a long time, but he said when he left that they made him an offer he couldn't refuse, so he was going to grab it. But it came as a surprise to me.

JOHNSON: I was looking back over my notes and I had it under "Headquarters." When you worked at Headquarters, you took part in testimony before Congress on the Research and Technology appropriation.

GOETZ: Yes.

JOHNSON: Do you have any memories of that you'd like to share?

GOETZ: Well, I can remember one session. I didn't testify, but we went as backup to the head of Code R, whoever that was at the time. [Jim] Kramer, I guess. And there was only one committee member there, and he was on a platform, in the front, and he had his feet on the table, had a big cigar in his mouth, and he was reading a newspaper throughout the whole testimony. So I remember that. I can remember his name, too. He's still there. [Laughs]

JOHNSON: In that position, also did you have anything to do with the turbine-engine hot-section technology?

GOETZ: Yes.

JOHNSON: Can you explain that to us?

GOETZ: That was started at Glenn, and that was a big, new initiative that we sold to the Congress and a hot-section turbine business because we were trying to get more money for Glenn and this was a new initiative. We had one at every Center, but that was one that we got that year, so we set up and planned it and so forth. Yes, I remember that very dramatically.

JOHNSON: Looking back over your career with NASA, which was quite a long career, what do you think was your most challenging achievement, or the most challenging aspect of your career?

GOETZ: That's a toughie. I thought you were going to ask that, and I have no idea, because *Challenger* was tough, no doubt about it. I was devastated. My morale was low, my whole feeling was down in the dumps. It took a lot to get up to go to work every day, so that, obviously, was a period of time when I remember.

But as far as having fun, I had fun at Rockwell for those six weeks that we did the Shuttle tile. I had fun at the technical evaluation down here at Houston for six weeks. I had fun early in my career. So I don't know which single one of those three would be the one, but I remember all of them.

JOHNSON: When you were down, as the rest of the Center was down, after *Challenger*, did you see an end in sight or did you see the possibilities?

GOETZ: Well, after that vote came, where we were supposed to get back into flight in six months, where we tried to regain control, in fact, put a bellyband around the tank and, like I say, Lew Allen and I were the only two that voted for it, so that means there was five other Centers that voted against us, because they wanted to fix it. They wanted to wait the period of time it took to fix it, and we figured that would be the death. It didn't turn out to be the death, but it sure took a long time.

Right then and there I decided to leave, after that vote, and that vote was like two months after *Challenger*, so that was before Jesse Moore came down and before Aaron Cohen became—I decided to leave the agency, because I had foreseen that it was going to be a long period of time before they got back to flight.

JOHNSON: What do you feel is your most significant accomplishment?

GOETZ: Most significant accomplishment? In NASA or—oh, in NASA. Starting Space Station I think is probably my most significant one. Even though it's gone out of control, I think it was started right.

JOHNSON: Then, of course, it began with the goal of being in orbit by [19]'91 or [19]'92.

GOETZ: That's right.

JOHNSON: Do you feel the way it was started, when you began it, that if you had stayed on that track, that they would have achieved that?

GOETZ: No, we would have achieved about [19]‘94, because we had originally set it challenging on purpose, and really, we had a schedule that said ’94–’95 [dollars permitting]. And it’s still only half built. Here it is 2003. It’s ridiculous.

JOHNSON: Is there anything else that we haven’t talked about, that you would like to bring up, or anything that you can think of?

GOETZ: Not that I can think of.

JOHNSON: Okay. We’d like to thank you for participating with us today.

GOETZ: Well, my pleasure.

JOHNSON: We appreciate it.

[End of interview]