

NASA JOHNSON SPACE CENTER ORAL HISTORY PROJECT

ORAL HISTORY TRANSCRIPT

KENNETH B. GILBREATH
INTERVIEWED BY JENNIFER ROSS-NAZZAL
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ROSS-NAZZAL: Today is February 26, 2003. This oral history with Kenneth B. Gilbreath is being conducted for the Johnson Space Center Oral History Project in Houston, Texas. Jennifer Ross-Nazzal is the interviewer, and she is assisted by Sandra Johnson.

Thank you so much for joining us this morning. We really appreciate it.

GILBREATH: My pleasure.

ROSS-NAZZAL: I'd like to start out with a basic question. Could you tell us about your interest in engineering, as a child?

GILBREATH: Well, that's rather interesting when I consider that, because growing up in a little country town in eastern New Mexico, a farming area, I didn't really know that I had too much interest in engineering. I was very excited about athletics and was very intensely involved in athletics all through high school, but sometime late in high school, probably my junior year, I began to realize that I had a lot of interest in chemistry and physics. Science began to become of some interest.

I recall before graduating from high school, I thought, "I might like to go to New Mexico School of Mines [Socorro, New Mexico] and be a mining engineer." So that was probably my first thoughts, really, about getting into engineering.

ROSS-NAZZAL: Were there any specific people or events that encouraged you to go into that field?

GILBREATH: Well, I had a good science teacher in high school, but, really, my life's course changed very quickly upon graduating from high school, because at my age a lot of families were still in a rather poor economic state. So I really did not have the financial ability to go to college right away, so I enlisted in the Navy at age seventeen, and it really was in the Navy that I became interested in technologies. In fact, I went to an electronics school in the Navy for a year, just out of basic training, and I found that very rewarding, very interesting. I spent four years in the Navy, working with electronic systems in naval air.

ROSS-NAZZAL: And then you went to school at New Mexico State University [Las Cruces, New Mexico].

GILBREATH: Yes. After leaving the Navy, I went back to my little hometown of Portales, New Mexico, and I started pre-engineering school there and went three semesters there. I met a nice lady and was married, and then went to New Mexico State and was at New Mexico State three years. Graduated in 1956.

ROSS-NAZZAL: After you graduated, you started working with Westinghouse [Corporation]. Can you tell us about your career with Westinghouse?

GILBREATH: Well, actually, my career was rather dynamic, in terms of jobs that I held right out of college, because I actually went to work for General Electric [Company] right out of college, at Richland, Washington. They were the managing contractor of the Hanford nuclear project facilities there. So I spent a year there in Washington, and then joined Westinghouse in Idaho at the National Reactor Test Station, training sailors to operate nuclear submarines. Did that for about three and a half years.

ROSS-NAZZAL: How did you find out about the position at White Sands Test Facility [Las Cruces, New Mexico]?

GILBREATH: Well, by that time I had been through the ICBM [Inter-Continental Ballistic Missile] programs, the Titan I and Titan II programs. As those programs completed, there was a lot of us in this country looking for new jobs, for different jobs. It turned out that the Apollo Program was developing in the early sixties, so while I was working the ICBM program, we kept track of what was happening in the Apollo Program and what it looked like.

And then after I was transferred back to Denver [Colorado], and the job situation in the ICBM business was very poor, because we had covered the entire United States and probably other places in the world with ICBMs, the Apollo Program was maturing to the point where they were beginning to build facilities, and I learned of the one at Las Cruces. I went down for a visit, took my family down for an Easter visit, and while they were visiting family, I went over to Las Cruces and visited the NASA facility.

The temporary site manager was a gentleman named Billy R. Gantz. Had a good meeting with him, and within two weeks I had an offer from NASA. I checked in there the first of May in 1964, to head up the Electrical Engineering Branch of that field office.

ROSS-NAZZAL: Could you tell us a little bit about the facilities at White Sands Test Facility when you arrived in '64?

GILBREATH: Well, it was primarily huge piles of dirt and a lot of dust. They were working on both the lunar module facilities and the command and service module facilities. North American [Aviation Inc.] was the contractor for the command and service module, and the Grumman [Aircraft Electronics] Corporation was the contractor for the lunar module. The [Army] Corps of Engineers was doing the [facility] construction.

It was well along at the time I arrived, but we didn't have office buildings yet, so we lived in trailers. We were probably in trailers for most of the first year that I was there. We moved into the office facilities in 1965. Then we began activating the [test] facilities in late 1965, and getting into actual testing. We began testing on the command and service module before the lunar module testing was ready, but they both then, very shortly, were running concurrently.

By 1966, we probably had on the order of 1,200 people on site, probably about 500 Grumman people and about as many North American employees, and then, of course, the base support contractors. Zia Company did our base operations support, just operated the basic facility.

ROSS-NAZZAL: You were the Chief of the Energy and Control Systems Branch. What were your basic duties and responsibilities?

GILBREATH: This had to do with all of the power distribution of the site, as well as all the electrical interfaces with the test stands, the test facilities, the backup power systems, all the diesel generators, the uninterrupted power supplies, and all the communications systems and the security systems and surveillance systems, like the video, and almost anything electrical, with the exception of instrumentation. There was a fellow named Mike [Michael J.] Hamilton who actually was responsible for the instrumentation that was installed on the test vehicles. My group did all of the power provisioning and the power supplies.

ROSS-NAZZAL: Previously you've mentioned the names of several contractors who worked out at White Sands Test Facility. Can you talk about the relationship between the contractors and the civil servants out at the facility?

GILBREATH: I can say a bit about that. Initially, contractors, as you would expect, are very independent. They came feeling that they knew more about the project than any other group would, and rightly so. They'd been involved in the intimate detail designs and all the test planning and the system development, but it did take a while for them to realize that NASA was the customer and we would be involved in and controlling, in fact, the test planning, approving the test plans. So there was a time required there to blend those two functions together, but they accepted us probably within a year. So by the time testing seriously began, probably in mid-'66

or in '67, they understood that we were part of the team, the test team, and it would be done with our agreement and with our approval.

As a result, we developed very effective team relationships, both with Grumman and with North American. There were some difficult personalities in the beginning, because they felt like they had come to do this job themselves and they didn't need our assistance, but later they understood that we did have a role, that we had to be there, because we were the direct interface back to JSC at that time, which was MSC at that time, Manned Spacecraft Center [Houston, Texas].

ROSS-NAZZAL: Could you talk to us about the relationship between White Sands Test Facility and the Manned Spacecraft Center at that time?

GILBREATH: At the time that I had the Electrical Branch, there had been two sort of interim managers of the site. Those two fellows didn't stay very long. One of them was named Wes [Wesley] Messing. There was a fellow from Houston that came out briefly. But Marty [Martin L.] Raines, a retired Army colonel, was appointed as the WSTF [White Sands Test Facility] manager. That probably happened in late 1965, so he was the manager all through the major testing era of the facility, up to '69.

He had a direct interface back here to the Center. For a while, it was the Propulsion Division, which was headed by a fellow named [Joseph] Guy Thibodaux, whom I believe you have spoken with sometime in the past. But then matters began to expand beyond just the technical propulsion testing. There were a lot of administrative relationships that had to be developed on budget and contracting and procurement. So I think his interface, then, became

more directly attached to Center management, to the Center Director, or to the Deputy Director of the Center, or to the Director of Administration here at the Center.

ROSS-NAZZAL: Do you think that that relationship has changed over time?

GILBREATH: Once the relationship developed to the point where it was [generally] recognized that WSTF did [much] more than just technical propulsion work, [MSC] then recognized [WSTF] as a rather diverse [technical operations] management [capability]. Then it was that the Center knew that various [functions] at the Center had to work [closely] with WSTF, and I really don't think that has changed a great deal since that time.

I became manager of the facility in 1969, after the Apollo landing. Of course, the intent, in general, across the agency for a brief time, was to phase the facility out. But at that time it was my personal experience that I worked with the [MSC] Director's office very directly. I had a technical assistant at that time, Mr. George [W. S.] Abbey, [on] whom you probably have a lot of data. [We also] worked with the Director of Administration, who at that time had procurement and budgeting. [Additionally, I] worked with the Director of Center Operations, who I later became closely associated with because of our facilities requirements and construction of facilities requirements. That was Mr. Joe [Joseph V.] Piland at that time.

The [working] interface [with MSC] had several facets; it was not just a single interface. But it was very effective, [we] had a good relationship with the Center Director's office, and then various other directorates as we needed them. And our technical fellows in propulsion testing and the instrumentation had direct interfaces back here with their technical counterparts, as required. And, of course, Guy Thibodaux's division was one of those, the Propulsion Division here at the Center.

ROSS-NAZZAL: Tell us about the relationship between the Army and the White Sands Test Facility at the time. What was that like?

GILBREATH: I had a very good relationship with the Army [and] the various commanding officers; I knew them personally. We would be invited, myself and others, to special events at the White Sands Missile Range [White Sands, New Mexico], special launchings or special ceremonies honoring someone over there. If we needed helicopter support on our side of the mountain range, ... the Army never failed to [provide excellent] support of that type. Being separated from them physically and geologically by a mountain range probably made our relationship smooth and effective. We were not a thorn in their side much of the time.

In the early days when we had a flight test program over there, we had a special group there from the Manned Spacecraft Center that organized and managed the entire flight test program. That was in 1964 and '65. They had their own interface with the missile range. Then when that program was completed, which was the testing of the Earth landing system and the emergency landing system for the command module, they phased out and came to the Manned Spacecraft Center, [while] we stayed [at WSTF] for the propulsion testing.

ROSS-NAZZAL: Could you tell us about the work atmosphere out at White Sands Test Facility while you were out there?

GILBREATH: I spoke earlier of a bit of an abrasion early on, and that probably was due to a [few specific] personalities, but that smoothed out and we had a very effective relationship with both

North American and with Grumman [as well as] within our NASA organization. Our NASA staffing was never very large out there, something on the order of fifty people, but we were close; we all knew each well, personally; and became a very effective strong team, even though [we were organized] into four teams. But we had very few people in each team, [we] were using contractors to get the job done.

We had a nice relationship among all the NASA people. We had great NASA annual picnics and Christmas parties and dances. There was a strong spirit of camaraderie. It was a good time. I think you would find probably in the careers of most of those people, they would say, "That was a bright time in my career." It was a fun time. It was an exciting time, because they knew they were doing something that was most unique, something that no one else had ever really considered seriously attempting, and they knew that the potential [for significant accomplishment] was great.

And then, of course, every success we experienced, it just excited everyone [on to] greater successes. It was a great time and a great team. And also the same was true in Grumman and in North American. Once they began to accomplish very positive results in systems development and testing, they all found it very rewarding.

ROSS-NAZZAL: There was actually a tragedy that occurred, the Apollo 1 fire.

GILBREATH: Sure did.

ROSS-NAZZAL: How did that impact the White Sands Test Facility?

GILBREATH: Well, you know, the agency was blindsided by the magnitude of the incident, of course. First of all, we had never suffered anything like that. Most people working in the agency probably had never really experienced anything of that nature, and then here the whole world had a magnifying glass on this incident. Suddenly the agency realized that we [had] so many things in the command module [that could] burn [in the] oxygen environment.

So the reaction was extremely swift, and the investigation was done quickly and thoroughly, and it clearly revealed that something had to be done significantly in terms of redesigning and reequipping the inside of the command module [with] different materials. They needed a place to do a lot of materials testing, to determine the real characteristics and qualities of various materials. And there really weren't [many materials test labs] existing, in terms of government facilities, and particularly of this nature, of pure oxygen environments, and then at [various oxygen] pressures [and] at very high temperatures.

We had a laboratory area with good shop facilities, manufacturing facilities, shops that could react very quickly. We were chosen to start some materials testing, and we developed test chambers, built our own test chambers, developed all the gas flow and distribution control systems, the instrumentation systems necessary to test materials, to see when will a certain material burn [and] under what conditions.

We got there very quickly. There may have been a limited effort at Marshall Space Flight Center [Huntsville, Alabama] at that time, but we moved so much more quickly, that soon White Sands Test Facility became the major materials test facility for the agency in correction of the [204] problem. In particular, Dave [David L.] Pippin was our manager of the laboratories at that time, and he was a very fine technical fellow and he was able to develop some amazing

control [and instrumentation] systems. At the same time, he had some good contractor support [that] developed the mechanical systems and all of the ignition systems.

In a very short time we were actively involved in materials testing, and [literally] tested thousands of materials, and we not only tested them for their flammability qualities, but for their odor testing [and toxicity]. We even had odor testing teams. One of the prizes that you would receive for doing odor testing would be a coffee cup that had a little skunk on the side of it. [Laughs]

The agency [quickly] established that certain materials had to be changed out in the spacecraft, and those materials had been tested by that time. White Sands continued an extensive materials test program for many years and [even] tested materials for other agencies—Department of Defense, Department of Army, others. It probably became the premier materials test facility for that type of testing in the United States, and I presume that those facilities still exist today.

ROSS-NAZZAL: They do, yes.

For a time, you were actually Chief of the Laboratory Branch. What role did you play in all of this?

GILBREATH: Yes, I did. I became chief of the laboratories, probably as a result of this accident. I left the Energy Branch and went up to the laboratories and took that over, and [with] Dave Pippin, put all the systems and the ideas and the designs together. I [spent] a year as manager of the laboratories during the processing of much of the [materials] testing, and [worked closely with] David. David Pippin worked for me while I was there, but he continued to run the detailed

testing. He was just an exceptional [technologist], he was absolutely the right person for that job at that time.

We had good contractors, and they were really committed to the job. The engineers [and] technicians were bright, they were interested in the project, they knew the severity of the accident, they knew the criticality of their work as it related to correcting the problem, and everything had to be done quickly. So we had a very productive eighteen months of materials testing in preparing for the redesigns and getting the new materials into the spacecraft.

ROSS-NAZZAL: What were your thoughts when Apollo 7 finally went up and returned safely?

GILBREATH: Oh, it's like so many of the successes. You had a lot of nervous moments and thought about it a lot, but [we] were absolutely delighted and elated when it occurred, when it had been successfully completed, [the pride of] the whole agency and nation and perhaps much of the world [peaked] when we landed in July of '69 on the Moon. In fact, I recall a neighbor across the street called me about two o'clock in the morning, and they had landed and Neil [A.] Armstrong was walking around, and he called me and says, "When is NASA going to do something exciting?" [Laughter]

We were all very pleased and very excited every time we experienced a new success. But, you know, the [204] accident, probably throughout the agency and certainly through the Manned Spacecraft Center, focused every individual's attention on what they were doing, in terms of doing it as thoroughly and to the absolute best of their ability for an extended period of time, and that led later to the resolution of problems as they arose. They analyzed them and corrected them in a more precise way, in a more thorough way.

ROSS-NAZZAL: Did you have any duties during the Apollo missions themselves?

GILBREATH: No, not really. We had ongoing testing all the time. We followed the missions very closely, but we were not operationally involved in the mission. We were not involved in any of the communications with them, and we had our own backlog that we were always working on. We were delighted the launch had been made, and we knew they were up there and we were tracking them. We had a little auditorium, probably [held] about 120 people or so at White Sands. We had the missions on video most of the time, so people could come to the auditorium and kind of see what was happening in the missions, in the flights. That was something that everyone was interested in and everyone did go to kind of check on, see how things were going, as they could.

But we, at the same time, had our backlogs and our work to do, so we had tests going on up at the test stands all the time. There were refinements on many of the propulsion systems, the reaction control systems, which were the attitude control systems of the spacecraft, of both the command and service module and the lunar module. So there was a lot of continuing work went on on that after the first launches.

ROSS-NAZZAL: Before you became manager of the site, you were Chief of the Engineering Branch.

GILBREATH: Yes. After I left the laboratory, I came back and took over the Engineering Branches and was in that job for several months to a year. That was kind of an overview job of

all of the operational systems of the Center, not only the electrical systems, but all of the mechanical systems, fluid distribution systems for the test stands and the basic facility operations, all the water systems and all the building maintenance and the operations. The facility maintenance and operations contractor worked for the Engineering Office.

ROSS-NAZZAL: There were a couple of times that NASA attempted to close White Sands Test Facility, and in 1970 it seems like they were about to close the facility. What were your thoughts about that at the time?

GILBREATH: Well, I did think about that quite a bit. I was the manager at that time. Marty Raines had [transferred] to Houston and had become Director of Safety and Quality Assurance. The direction that I was receiving and obviously implementing was that, yes, we were going to close the facility, so, transferred about half of our employees onto JSC in 1970. You have talked to a number of those people that came down at that time.

We maintained an operating staff then of about twenty-five people. But during that ensuing year, during '71 in particular, plans began to come together for the Shuttle spacecraft, and the engineering and development people who were associated with propulsion on the Shuttle recognized that they were going to have to do some propulsion testing on the smaller engines of the Shuttle, on the attitude control engines.

So they said, "Where could that be done?" They looked at Marshall Space Flight Center and at [John C.] Stennis [Space Center] in Mississippi, and I think there were even some considerations for maybe doing some small-engine testing perhaps in Florida. But it became quite clear very quickly that NASA already had possession of some rather significant and very

good test facilities for engines of that nature, and we had vacuum chamber capability for testing engines in a vacuum, and we had atmospheric test stands.

So during '71, the decision was beginning to materialize in the minds of some of the technical people here, and probably in NASA Headquarters [Washington, D.C.] as well, that "Maybe we'd better not close that test [facility] just yet. Let's pursue this requirement for the testing on the smaller engines of the Shuttle," and they did that.

By the end of 1971, they really had made that decision that we're going to keep the facility open for that purpose. Now, we may just hold it in abeyance for a while, not re-staff to any great level, because we'd gotten to a total staffing of around two hundred people, about twenty-five or thirty NASA people, and then some contractor staffing, just to take care of the operations of the utility systems and the care for the facilities, the maintenance and operation of the facilities, and take care of the test stands.

By January of '72, that decision had been made somewhere in the technical structuring of the Shuttle Program, probably by Max [Maxime A.] Faget and Guy Thibodaux and others, because Max Faget was the primary architect of the Shuttle, for MSC.

So then they began to think about re-staffing and reorganizing, how to do this. Well, I was not a propulsion person by background. So they transferred a gentleman from here named Jesse [C.] Jones. Jesse had developed a test facility here. He had had an early test facility over at the Ellington field, the old Ellington Air Force Base [Houston, Texas]. The Air Force had allowed NASA to come in and develop a little area over there, and he had done some early fuels testing and perhaps some propulsion testing. The thermochemical test area here at the [Johnson] Space Center [was completed in the early '60s], and he was the manager of that facility for several years. So he was a logical person to come and manage a propulsion test facility.

And at that time General [Frank A.] Bogart had come to NASA. He was the Associate Director [at MSC], which really meant that he was responsible for all administrative support to the Director of the Center. He had become my principal interface, and he and I became rather well acquainted. It was his idea for me to come down here, so when he asked me to come down in the spring of around 1972, there was really no way to say, “No, I’d like to stay in New Mexico,” even though I was a native of New Mexico and loved it.

It turned out that he was right, and it was a great thing for me and for my career, and the right thing for the agency, because the fellow they sent out there to be the manager of a propulsion facility was much more well qualified than I, and the types of things that I came down here to do, I was more qualified to do that than propulsion. And I came down the first of April in 1972 to become Joe Piland’s deputy.

ROSS-NAZZAL: Could you tell us how working at the Manned Spacecraft Center differed from working at the test facility?

GILBREATH: Oh, yes, there was a lot of difference, all right. Of course, your interfaces throughout the organizations multiplied manyfold. We were such a small group out there, that it was kind of like working in a small kitchen where you can reach everything. We knew everyone personally. You’d see everyone eye-to-eye. But [as I] came to MSC, and it was a huge organization at that time. In fact, our civil service organization in the Center Operations Directorate at that time was about 500 civil service people, and in the order of 1,200 [to] 1,300 contractor people, perhaps even more at that time, probably closer maybe to 1,500 people.

So you had all of those organizational elements to learn what they're doing and who it is that makes things happen and why things happen the way they do. And, of course, all the rest of the organizational elements of the Manned Spacecraft Center, which I really didn't know very many of those people. All the engineering divisions worked for Max Faget, and then [many divisions] over in science, and all of the flight operations and the aircraft operations. Of course, I came into a job, then, that was responsible for all of the facilities that all of those people used.

ROSS-NAZZAL: What were some of the major projects that you headed up as Deputy Director?

GILBREATH: This was after Apollo and before Shuttle was real well defined, so we weren't building very many new facilities at that time. We were doing some modifications of a lot of buildings, and particularly as Shuttle became more defined. We began to get into a lot of the requirements for a lot of offsite space, so we were modifying, acquiring, or leasing, and acquiring buildings just like the building that you reside in here in Clear Lake City [Texas]. And we would have to modify a lot of that space to accommodate the Shuttle organizational elements that were being pulled together, NASA and contractor, and we were beginning to make a lot of laboratory modifications [on site].

Then as Shuttle began to develop, our manufacturing shops, which was part of the Center Operations Directorate at that time, began to do a lot of special fabrication work for the engineers that were driving the Shuttle Program. And, of course, in the early part of the seventies, the Skylab Program was very active, and our manufacturing facilities of the Center Operations Directorate were very intimately involved in that, and played some major roles in some of the incidents that we had in flight there.

The one that you may know about is, we had had some damage on launch and in flight, and had to have a sun shield. Jack [A.] Kinzler was heading the shops, the Manufacturing Division, at that time. They were called Technical Services Division. He was very personally, and his people were very much involved in resolving that problem, along with working with some of the engineering people.

Later we began to build facilities as the Shuttle Program matured more, but we built the first water immersion facility. We modified Building 29. The portion that we modified had been originally designed and built as a big centrifuge for the astronauts to be spun up into for high-G testing. They never did use it very much. So it became a large open facility that was available for something. So that's where we built our first water immersion facility. And years later, in the nineties, they built the current facility over near the Ellington Field, and you're familiar with that. But the facility in Building 29, the water immersion facility, is still used for some training purposes.

I was trying to think of other major projects that we built in those days. One of the most rewarding projects that I personally was involved in just before my retirement, actually, was the [construction] of Building 4 South, which was a new housing area for the astronauts and many other support people, a six-floor structure, about a 240,000-square-foot facility. It was fun to work with all of the people, the astronauts included, that were going to be living there and using it, with all the flight operations units. That building turned out, a very successful project, and I'm sure is still fully populated today.

We modified every building on the Center. In fact, during the eighties, and I guess early nineties, probably eighties, we flew some sensitive flights for the Air Force, for the military, and

we did some significant modifications to the Mission Operations Center for that. Those were some of the most [unique] modifications that we did.

We did build Building 17 in the mid-seventies or so. It was primarily for the Science Directorate. It's kind of hard to recall just when some of those things did happen. I know Building 17, eventually one area in it became the home for the Center's communication system, as we changed over from old-fashioned communications, hardwire kind of systems, to the computerized systems that they have today. At that time we transferred that communications function from the Center Operations Directorate to the Data Systems Directorate, and that occurred in the early eighties.

ROSS-NAZZAL: You sound awfully busy.

GILBREATH: We were very busy. And, of course, jokingly, we were often referred to as the people who did all the ash, trash, and garbage functions of the Center, but we took all of that in good humor. We took care of the grounds and all the security function and all the transportation and the logistics, the warehousing and the shops and the printing and the library, which many, many changes have occurred in many of those areas since 1995.

ROSS-NAZZAL: All those things are important in running a Center.

GILBREATH: I've always referred to them as base operations support functions, and those functions just have to be done by someone. Well, it turned out that I was a guy that enjoyed doing those kinds of functions. And the fellow that I worked for, Joe Piland, when I first came to

MSC in '72, he was also that kind of person. He liked general management, general operations, and enjoyed having a lot of different things to do.

But fortunately we had a lot of people at the Space Center that were very talented and enjoyed doing a very specific thing and were very good at it. It just took all kinds of people to make the Space Center operation effective and successful.

ROSS-NAZZAL: Let me ask you a couple of questions. You talked about some of the facility changes that you made on site, one of which was the change in the Mission Control Center, so that you could support Air Force flights. Could you talk about your role in dealing with the Air Force in making those changes?

GILBREATH: My specific role, I was at a bit of a distance, and intentionally, and I kept myself in that position. I had a very capable security officer at that time, a gent [gentleman] named Everett [D.] Shafer. He had an extensive background in security, and he was very effective in working with the Air Force, he and a few of his Security Branch people, and had excellent working interface with them.

So I never tried to delve into the details of “Why are we doing this? What is the mission going to accomplish? Why do we need to modify the building exactly in this way?” But what I was concerned about was maintaining the integrity of the core facility, not destroy it in such a way that it would not be useful for NASA in another application one day, and also to be sure that the Air Force provided funds in the proper amount for the need that they [were] defining and that we could get it done on time to support the flight schedules.

So I kept my interface primarily with my security officer and a very limited number of Air Force, two or three key people in the Air Force, and one of those reasons being funding. One of the individuals [in particular] was strictly for funding, [and] he knew where Air Force money [was and] how it could be made available to NASA. And then I had a couple of other Air Force people that occasionally did need to discuss a bit of the nature of the facility and the operational requirements within the facility. I stayed on the outside of the locked doors, by intent, and it was better for the Air Force and better for our security people, and it worked out nicely.

I did have one security person that worked inside the [flight control] organization operationally, stayed with our NASA flight operations people and the Air Force operations people all the way through the critical missions, and that person was committed and dedicated to that, and became a part of the flight operations organization, really, for several years. That person was the interface with NASA security in what we needed to do and what we could agree to, and that became a very effective arrangement. By the way, that person happened to be a woman.

ROSS-NAZZAL: That was something that I wanted to ask you about. During the seventies and eighties, NASA was trying to recruit more minorities and women to work in their work force. What was your role in doing that?

GILBREATH: Well, I was obviously aware of what the Center and the agency was trying to do and what we needed to do, in terms of employment opportunities and diversity. My role was to—and I did work very closely with our HR [Human Resources] Department in hiring people. We hired a lot of terrific women and various minority groups during that time. But even prior to that time, we had a basic core of very talented, committed, dedicated women in our organization.

Our organization was of a sufficiently different nature that we could employ a lot of women. We had a lot of lower-paying jobs, so we had a lot of technician people, a lot of technician fellows and women, all across our divisions—Logistics Division, Technical Information Division, in our shops. And we did manage to integrate women into our shops.

In our print plant, the assistant manager of the print plant was a woman. The Logistics Division Chief was a woman, a woman named Elsie [M.] Easley. She was just a classic of a hardworking person that was bright and had just worked hard and learned the business and happened to be good in managing people, so she became Division Chief. Could very well have been the first female Division Chief at the Center. Of course, her Logistics Division had a lot of women in it who were materials managers at all levels.

And then in Engineering, we began to hire a lot of women, and not only just in specialty fields of like environmentalists, [but all technical disciplines]. ... [As for] environmental engineers, we were able to hire some very capable women in those positions. ... In fact, a civil engineer that I hired in about 1978 or so, I just saw her very recently and she's still there and still running some civil engineering functions in the facilities design world. Many of our administrative assistants in the divisions were women.

I found that women were realizing that they were seeing opportunities, that they had never had before, so they were willing to try for them and to work harder and commit themselves to them, and as a result, they progressed and they did terrific jobs. The Center Operations Directorate, by the time I retired, probably had about 200 women out of a staff of 400. So across the board it was almost fifty-fifty.

And then minorities began to [experience] some real success in the eighties, [and we began] hiring some good minorities. I hired several from Prairie View A&M [University, Prairie

View, Texas]. And one of the fellows progressed just steadily to become a branch chief in design, and just did an outstanding job in the Electrical Facilities Design Branch, and did some very complicated jobs. Of course, he's still there.

But in all functions we had some good minorities. We just had an overall good experience. Very few problems and disappointments on the part of minorities. Most of them were very pleased that they came to our directorate. And then after gaining experience in our directorate, many of them had the opportunity then to move on over into perhaps more attractive and exciting work elements of the Center. And I was glad to see that.

ROSS-NAZZAL: I know that you had been given credit for some of these recruiting efforts. I know you won an award from the Federal Women's Program and from the EEO [Equal Employment Opportunity], so I thought I would ask you about that.

GILBREATH: I did, and I enjoyed doing that. I enjoyed seeing people succeed. I enjoyed building teams and seeing them become effective team members and then seeing them reap the rewards of that personally, their personal satisfaction of being an effective team member and making friends, just see them make friends [with] their professional associates across the Center. It turned out to be much better than many of them had ever thought they would have opportunities to experience.

ROSS-NAZZAL: That's wonderful. It's wonderful you could make that sort of an impact on the Center.

GILBREATH: I have to say, I had probably greater opportunities to do that than most managers did, because some of the organizations, they simply had to have a very precisely trained specialist to go into a job, to a particular job, and I had much more latitude. I could allow people to generally develop into a job and develop their expertise there.

ROSS-NAZZAL: Let me ask you about a couple of other things that I know that you handled as Director of Center Operations. STS-3 actually landed out at White Sands Missile Range, on the Northrup Strip, and I understand your organization helped transfer equipment and hardware out to White Sands.

GILBREATH: Oh, yes. That was very unexpected, even though we knew we could do it. My transportation officer at that time was a gentleman named Dave [B.] Homer. Fortunately, he had a wealth of experience and depth in transportation capabilities and services that were available throughout the government, and he knew how to interface with other government agencies.

So when that occurred, he had to move very quickly. It was staggering, the amount of equipment, lifting equipment, hauling equipment, that had to be moved a hundred miles up into the desert from the closest area where any of that equipment existed, and that was in the El Paso [Texas] area, and maybe some from Fort Bliss [Texas], and there was a limited amount from the White Sands Missile Range.

They had to set up housing and move all of the hauling equipment and all of the lifting equipment. You're talking about lifting the Shuttle. There's no built-in cranes or anything out there, so you had to lift that onto a 747 later, for removal from the desert. So it was an exciting, challenging time for my Transportation Branch that was handling that. I did not go out on that.

We had re-staffed, by the way, White Sands at that time, so we had a lot of very capable people out at White Sands that worked for Rob [R.] Tillett. You have talked to several of those people that were there at that time. So they were intimately involved and intensely involved in getting ready, like twenty-four hours [per day]. I mean, they didn't have much time to get this done.

So my transportation people were principally the ones that were interfacing with them and moving all that big equipment out there, and then getting the Shuttle equipped in such a way that we could pick it up and put it on the 747 after the 747 came in, and then get it on back to [Cape Canaveral] Florida. But that was very challenging.

And then right in the middle of all that, they had one of the worst sandstorms the area had ever seen. It was more than a duststorm; it was a sandstorm. If you've ever seen any of the video after that landing, it was just unbelievable how bad two or three days were, because it was in the spring of the year, which is the high-velocity wind times for that missile range area. And, of course, it's a white powder. It is just blinding when the wind whips it up. Everything they had there, including the spacecraft, was full of dust. After they got it back to Kennedy [Space] Center [Florida], they [were] a long time in cleaning everything up.

That was a time, that was an occasion when a lot of people, as they say, rose to the occasion and got a lot of significant things accomplished in a very short time. But we had great support, as you do in national things. At that time we hadn't flown too many Shuttles, so the nation was still very much focused on the Shuttle flights. So everyone that we approached for support—at the missile range, in the Department of Army, Fort Bliss, wherever we needed to go, contractors in El Paso—everyone responded very quickly. But fortunately, as I indicated, Dave Homer was an individual who had had many years of experience in handling all kinds of big, heavy equipment, and knew how to get things done quickly. So we were fortunate to have him.

ROSS-NAZZAL: Sounds fortunate that you have so many deputies you could call on.

GILBREATH: Yes, yes.

ROSS-NAZZAL: You were also involved in the phasing-out of the Ellington Air Force Base procedures. Could you talk a little bit about that?

GILBREATH: I was. The city of Houston, along with the Air Force, formed a committee composed of representatives from the city of Houston, the business communities, the Air Force, and NASA, and I became the NASA representative. Since we were talking about facilities and real estate, it was logical that I would be named as a member to that committee. That committee functioned for eight years, and it was obvious from the beginning that the facility would serve what appeared to most of us future needs of the city of Houston quite well. But a complication developed in the process of those eight years, where the city of Pasadena [Texas] wanted some of the action, so, legitimately, we could not ignore their request, but that did delay the real estate transaction substantially.

But eventually the resolution was that Pasadena agreed to accepting 110 acres on the north side of the Ellington Field property. That included the old golf course, which was a nine-hole course at that time, and additional acreage to make up the 110 acres. That land took them up to where the Beltway 8 is currently, and that became part of city of Pasadena. And upon reaching that agreement with them, at least Pasadena and the mayor of Pasadena was comfortable with that.

Then that left the rest of the property then for the Air Force to decide what's the best interest of the government as well as the community. They decided that the Air National Guard would stay, and the 147th Air Guard Unit is still there, and the Coast Guard would build new facilities and take an additional piece of property at the north end of the flight line. And NASA would take the properties that they were occupying at the south end of the flight line, plus Hangar 990, which we had acquired a few years earlier from the Air Force. It was further up the flight line. That was sort of a thorn in [the] side [of the Air Force] for a while, because the city of Houston really would like to have had that facility.

But we had [some] large aircraft. Our zero-G aircraft [was] operating from up there, as well as some U-2 aircraft at that time. We needed a large hangar for the protection of those, and [servicing of] those aircraft. Plus, there were about ten or twelve acres of land associated with it, [which afforded us] reasonable ramp space for those large aircraft.

NASA retained that piece of property, plus the two big hangars at the south end of the facility. The city of Houston, then, took the rest of the property. Of course, since that time, the Coast Guard moved into nice new facilities, and the UPS [United Parcel Service] has come in by NASA and has a nice flight support facility there. Most of the old buildings across the property have been torn down, and they were all early 1940s vintage barracks, and various [support] buildings.

At some point, Grumman had an office building [constructed], and it's the big black glass office building that exists there today. I don't know who uses that. Eventually Continental Airlines [Inc.] came in and put their express terminal in the old [Air Force] flight operations building.

All of that sounds rather simple, but it took eight years. It was very politically loaded. The politicians supporting the people in Houston and in Pasadena were very sensitive about it. They wanted to get as much as they could. And, of course, our NASA position was very firm. We knew exactly what properties we needed to retain, so that really was done rather smoothly.

There was a gentleman that headed that, by the name of Thompson, who was a retired reserve Air Force general, and he was working in Houston with a steel supply company. The reason he was selected, he knew everyone in the city of Houston, plus he knew everyone in the Air Force, and he knew many of the politicians. He did a good job on that, but it was very slow, very deliberate action. The culmination was effective. Everyone was satisfied when it was over, but it did take eight years. I attended a lot of meetings in downtown Houston over those eight years. But it was well that NASA did retain the properties that they held there. It has served the agency extremely well.

ROSS-NAZZAL: You seemed to be involved in a number of negotiations. You also worked with Harris County, negotiating an easement for a public road through JSC.

GILBREATH: Oh, yes. Actually, we had two of those. The first one was the road that today you know as Space Center Boulevard, which curves around the north side of the Space Center. For NASA and JSC, it was primarily a buffer zone back behind the thermochemical test area and behind our logistics area. It was wooded, primarily, but we needed a traffic pattern that connected NASA Road 1 from the vicinity out of the lake back over toward University of Houston-[Clear Lake, Houston, Texas] and that area.

NASA didn't need it as such, even though it probably benefited our employees to a great extent, but the county obviously they saw a real need for this. So we did negotiate with them, and they incurred all of the costs associated with it, all of the road construction, the street construction, the drainage, all of the fencing on both sides of the highway. We granted them some sixty-seven acres or so of land, which was a narrow strip all the way around the north side of the Space Center.

The Space Center was about 1,650 acres originally, so that little piece of land was extracted as a right-of-way and granted to Harris County. It has worked out extremely well. I still travel it occasionally and take a look at it to see how it's doing, and it has served the area quite well. But the agency incurred no cost associated with that, and I still believe it was the right thing to do.

ROSS-NAZZAL: Tell us how you were able to maintain the level of excellence at JSC with diminishing budgets.

GILBREATH: Well, you know, that is indeed an interesting question, and one that [we] were faced with every year as budgets changed. Starting after the Apollo Program, budgets tended to change every year and in a negative direction, even though the Shuttle Program came along and maybe we experienced some stabilization in budgeting there for a while in our areas, particularly facilities support functions.

If you're far enough away, like in a Headquarters budget position, you don't attach a premium value to [the facility] element of the budget. You say, "Well, let's cut that budget a little more, let's cut this a little more. That's just support services."

We were experiencing that through the seventies and even into the eighties. We found that [in] the era of the Apollo, we were determined we were going to make this project a reality. During that time, budgeting, resources, staffing were not critical concerns. So in many areas, we did indeed have more resources than we probably really needed if we exercised astute management and we looked at our functions critically. And that's really what we began to do during the seventies.

In fact, as an example, when I joined the Center Operations Directorate in 1972, the grounds care function had thirty-five man-years associated with it, [which] was organized labor, unionized labor, [resulting in] hourly rates [which] were much elevated, relative to doing grounds work over here in Clear Lake City [Texas]. We had thirty-five man-years doing that.

Just as an example, we trimmed that over a few years down to about seventeen man-years, so about half. And I found that, in many other functions, and, of course, naturally, a sensitive issue that you encounter is, the people in your organization that you hold responsible for a particular function, sometimes they find it very difficult and they're not willing to take a risk and try to do a function as well, but do it with some significant less resource.

So that was always a continuing challenge and one you had to probe and pursue with your managers. But with time, we were able to penetrate most functional areas, whether it was the shop's support services contract or your printing contract or your construction services. You always have a construction contractor on site to modify your office or to modify a laboratory. But each one of those elemental functions, as you start breaking them down, we found softness.

In fact, in a very short time, within the first couple of years I was here, I persuaded our administrative people to change our style of contracting from a huge umbrella contract, one

contract that had all of the functional elements underlying, into a number of independent contracts. And we did that, and that was the significant reduction that we were able to achieve.

As you broke it down, then, and put competition into each functional element, it made a lot more administrative work for us in NASA, because I had to appoint Source Evaluation Boards for each one of these contracts, and those people weren't excited about going out and doing all of that [work]. But then when you opened that functional element up for competition, lo and behold, some contractor decided that he sees a way that he can do that job for 150 man-years instead of 200 man-years. So we did that incrementally, across [the directorate].

That system prevailed up until the early nineties, and it may have been changed to some extent after my retirement, but it meant that I had to devote a lot of personal attention to each contract. I had to know how it was operating. I had to know the managers and the key people of each contract. My premise was that if you break it into a smaller element, then we, NASA, had better visibility into it. We could see how the work was being done; we could see how busy the people were; we could see how many people were really required to do it; we could better see the quality of how they were doing [the job].

There was a counterargument that said by introducing so many independent contracts, freestanding contracts, that you are also introducing a lot of administrative overhead. And there probably was some element of truth to that, but the competition seemed to have [also minimized] that. ...

So that's really how we made it through the late seventies and through the eighties, because the budgets decreased tremendously during that time. But a lot of NASA people did a lot of hard work as technical managers of those contracts, and squeezing every bit of productivity out of those contracts that they could. We had a lot of good contractors who tried hard to do the

job well and to do it at a good price. In our incentive-based contracts—the fee structure is such that contractors are often not incentivized to save money, so we had to work very closely with them to help them understand how it was in their best interest to perform the task at a certain cost level and a certain level of manpower.

What do you say let's take a little break.

ROSS-NAZZAL: Sure. That sounds good.

[Tape recorder turned off.]

ROSS-NAZZAL: You retired in 1993. Can you share with us why you decided to retire at this point?

GILBREATH: Well, yes. I had been in the same job essentially for twenty-one years, since coming to Houston in 1972, because the Deputy Center Operations Director was [generally] the same job as the Director of Center Operations. And I'm sure when you interviewed Grady [E.] McCright, he probably would have told you the same thing, because he was my deputy for a good long while. ... Our responsibilities were parallel and of the same nature.

I had been in the job long enough, but I had thoroughly enjoyed it. But I did find the last couple of years that I had done most things many, many times before, and I thought, well, that must be a sign that you're approaching time for retirement. And I did have about thirty-five years of government service, so I thought that's just about enough. And I was age sixty-three, and there were many, many things in this world that I had not ever had an opportunity of doing.

My wife had retired the year before from teaching, and her situation, of course, was the same, many things that she had never really had an opportunity to do.

That last year that I worked, I formulated some plans about traveling and all, that I would like to do, and we set about to do those after I retired, and it has been a very fast ten years. In another month it'll be ten years. It has been exciting at times and just tremendously rewarding, satisfying, and enjoyable. We have traveled extensively, primarily in Europe, and traveled with groups of friends, most of whom are NASA retirees of one type or another.

My grandchildren have been growing up during that period of ten years. At this point I have two granddaughters who will soon be fourteen, in another month, and two grandsons who are nine and twelve. So the nine-year-old has grown up essentially during that time. I've spent a lot of time with him. Two of them live in San Diego [California] and two of them live in London [England]. So we've spent a lot of time in England and a lot of time in France, Germany, Italy, Spain, Portugal, and Scandinavian countries, and we're continuing to do that. Have one coming up in a month [to Belgium and Holland].

ROSS-NAZZAL: Sounds like fun.

GILBREATH: It has been. My wife and I both realize that we've been very fortunate, both retired, with reasonably good health, and in a position to do those types of things. I would not do it differently, and I do know that some people have found it very difficult to leave their professional career. But it's just a decision that we all have to individually examine and see how that weighs out against the rest of your life.

I had some people who worked for me who were so dedicated, and their job was the principal part of their life—you've mentioned one of them here this morning—that it was just not the right time in their life to retire. And many of them are still there, and that's great. If that's the fulfillment of their life, well, that's what they should be doing.

But on the other hand, I've known many NASA people who have done similar to what I have done. In fact, I had an interesting experience in Paris [France] one day. My wife and I went into La Samaritaine for lunch, which is a big department store with a restaurant, and walked in and met Chris [Christopher C.] Kraft and his wife having lunch.

ROSS-NAZZAL: What are the odds?

GILBREATH: He had been in Paris two weeks at that time, and we had just come from Scotland with our daughter, who lived in London, and back to her place, and then from her place we'd gone into Paris. And here's Chris Kraft, finishing his lunch, smoking a cigar. [Laughter] So we had a good visit.

ROSS-NAZZAL: That's great.

GILBREATH: But that's kind of how our retirement has gone. Now, a lot of people, some of the fellows I play golf with—by the way, we do play golf—but some of the fellows work part-time. They work twenty or thirty hours a week. But [while working] I found that I had never had an opportunity to play golf. In fact, when I met Chris Kraft in Paris, he said—he knew I'd been to Scotland—he said, “Did you play golf?” Of course, the weather was horrible in Scotland, so I

didn't, even though the Scottish do play golf in terrible weather. He enjoys playing golf, and I'm sure he has enjoyed his retirement very much.

ROSS-NAZZAL: I would hope so.

GILBREATH: I always encourage people to seriously consider retirement when they reach that point in their life, because mine has been very fulfilling, very rewarding. Very pleased. Did it at the right time. And also I felt like as I left, I left it in very good hands. Could not have had a more capable replacement than Grady McCright. If you track his career, you can see how well he has done, everywhere he has been. In fact, I hired him out of college.

So, anything else?

ROSS-NAZZAL: I have two questions for you.

GILBREATH: Okay.

ROSS-NAZZAL: What do you think has been your most challenging milestone in your career at NASA?

GILBREATH: Well, due to the nature of my work, I had such a diverse workforce, doing so many different things, that it required so many different types of people, that probably team-building, team-reinforcing, developing the spirit of teammanship and personal commitment on the part of the employees to their unit, to their functions was probably the most challenging thing.

Of course, we had a lot of challenging budget requirements through the years. We spoke of that earlier. But, really, molding teams of people together, molding people into teams, and then teams into teams—in fact, I think that’s one of the things [at which] NASA has excelled. But in my case, in a very general support services function like I had, you just dealt with so many different types of contractors, types of government employees, and you had to have all of those working together, working smoothly together, knowing each other, and having common objectives, and accomplishing those objectives, and then taking satisfaction from having been a part of a team and having accomplished those goals.

I certainly was no strong technical person, so I never really participated in any of the fantastic technological accomplishments that NASA has made and is still making today. But the organizational functioning support, supporting those people who were doing a lot of those unbelievable technical things was very rewarding for all of us and for the teams that we had in Center operations.

ROSS-NAZZAL: What do you think was your most significant accomplishment while working for NASA?

GILBREATH: Well, I’d have to say it’s probably essentially the same thing, [that] is building [and] keeping together a strong, well-blended organization that supported what the Center needed to have done, and doing that effectively and efficiently, and doing that at the best cost levels. [A major accomplishment was assuring] satisfied customers over in the technical and operations world, the Flight Operations people, the Engineering Division people as they were developing systems, and all the things that we had to do for them.

That would be the most significant thing, and [I] was delighted to be a part of the NASA team doing that, just contributing in that way, being sure that we were all successful and it was done well. So that's how I felt about it when I first went there and that was the way I felt about it the day I left.

ROSS-NAZZAL: Well, great. Do you have any more items you'd like to share with us? We're getting close to the time that you would like to leave.

GILBREATH: No, I think we've just about covered the whole thing. I appreciate the way you did the interview.

ROSS-NAZZAL: Great. Well, we enjoyed hearing about your career.

GILBREATH: Well, thank you.

[End of interview]