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ORAL HISTORY TRANSCRIPT

PARRISH HIRASAKI
INTERVIEWED BY JENNIFER ROSS-NAZZAL
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ROSS-NAZZAL: Today is August 2nd, 2023. This interview with Parrish Hirasaki is being conducted for the NASA Oral History Project. The interviewer is Jennifer Ross-Nazzal. Thanks again for taking time out of your morning. I appreciate it. I wondered if you would talk about your interest in science and engineering and math as a child.

HIRASAKI: I was always really good at math. There's a math brain in my family that I got. Not everybody got it, but I got it. My oldest brother got it. He was a math major at Duke [University, Durham, North Carolina], and I was always going to be a math teacher. Of course that was the only option I had. I was also an artist, and I was interested in art. I say that I chose between art and math, but I really knew I wasn't going to choose art because it wasn't practical.

I started Duke as a math major. At the time Duke held the female population to one-third of the student body, and the Ivy League schools only had men. The girls at Duke had the second highest SATs [standardized admission tests] in the country for women. I forget what the school was that had higher scores. But to the men at Duke then, or the boys—at the time we were boys and girls—we were the brains, because we couldn't get in anywhere else, whereas the Ivy League drained off the smartest boys.

To help the guys out, they split freshman English by sex, and so there I was—a math whiz—taking freshman English with almost the smartest girls in the nation, who in general were really good at that sort of thing. Right away I was struggling.

My freshman grades were less than stellar. I also had a good time.

ROSS-NAZZAL: It's college.

HIRASAKI: My first semester sophomore year, my roommate said she was going to leave Duke to go be near the boy she had met at home in Memphis over the summer. There were four of us who were friends. We were friends with another couple that were roommates, and all of us lived in a big dorm. This was before coed dorms.

ROSS-NAZZAL: Those were the days.

HIRASAKI: The girls were on one campus; the boys were over a mile away on another side.

Engineering school, of course, was located over where all the boys were, so I had to commute. They had free buses. I think once I had a class on the women's campus, but most of the classroom space was on the other campus.

But anyway, the three of us friends were trying to keep my roommate at Duke. "Let's go to the counseling center and take some tests." You took a bunch of tests to determine your major. Then you had this private interview with a counselor. Each of the three of us in our private interview told her what we were up to. We don't want this other student to leave Duke.

Meanwhile this counselor, who had been to four different universities in her four years, thought leaving Duke was a good idea and encouraged my roommate to go. Meanwhile she looked at my stuff, at my grades, at my aptitude and all, and suggested engineering, and that's how I got into engineering. It would have never happened.

ROSS-NAZZAL: Did you know what engineering was at that point?

HIRASAKI: Probably, maybe not before I went to Duke. I wouldn't have known much but by then I probably did. Yes, had a pretty good idea at that point. My parents were just horrified. The other thing was I'd be the only girl in the class and to me that was just terrific. When I'm talking to girls in middle school and high school, trying to talk them into studying engineering, I found that I was pretty unique in thinking that that was a good thing.

ROSS-NAZZAL: That is pretty funny.

HIRASAKI: It was a horrifying thing to everybody else. To me that was a great thing.

ROSS-NAZZAL: I have to ask. Was it because you would stand out as a woman? Or was it more of a dating thing?

HIRASAKI: It's funny. I think it was more of a dating thing or just being unique. So it was kind of a mix, I guess, yes.

The other thing was I was taking German because I was going to get a Bachelor of Science and you couldn't take Spanish for that. You had to have a language. I started fresh in a language I hadn't had, and I was doing progressively worse. I made a B, and then I made a C and as it turned out that semester I did make a D. There was no language requirement in engineering. That was a real big carrot there.

ROSS-NAZZAL: Yes, I can imagine.

HIRASAKI: I transferred into engineering second semester sophomore year, never went to summer school, and had some horrendous semesters of 20 hours. One semester I had classes all day. I had labs every afternoon or two, but in any event it was still a lot easier for me.

I had used up a lot of my elective credits in those first three semesters. Some of it was required for engineering, but not everything like the three semesters of German. When other people had some easy stuff and didn't have engineering labs, I was all stacked up. I'm not sure I took much that first spring semester – mechanical drawing and one mechanical engineering course.

ROSS-NAZZAL: Oh my goodness, 20 hours, that's crazy.

HIRASAKI: I ended up being vice president of the engineering student body, not that the student body was that big. It was about 500 people.

ROSS-NAZZAL: It sounds like you were pretty social when you went to Duke.

HIRASAKI: Yes.

ROSS-NAZZAL: What sort of project did you work on? One of my friends was an engineering major in college—I went to a big engineering school—I remember they had a project that they had to do before they graduated. Did you have to do anything similar?

HIRASAKI: No. I didn't have anything like that until I got my master's later. I did some basic programming. Programming in computers was just coming in. I must have had some kind of senior project, but I remember being with the professor and filling out the sheets where you put the code in letter by letter, turn it in, and they print it up. It was really simple. It was very very basic. Calculators hadn't even come out yet. There was just nothing at that time. We still used slide rules.

ROSS-NAZZAL: How did you find out about the opportunity to work at TRW [Thompson Ramo Wooldridge]?

HIRASAKI: They came to school to interview. I didn't decide about the space program until I was interviewing. JPL [Jet Propulsion Laboratory, Pasadena, California] came to campus and TRW. Grumman came to campus. I got an offer from Grumman. I did not get an offer from JPL. JPL did not offer me a trip, but I went to Grumman in Bethpage, New York. I did fly to Houston to interview with TRW. One of those trips was the first time I'd ever flown.

ROSS-NAZZAL: What a treat!

HIRASAKI: Yes. One of the planes—and John [Hirasaki, my husband,] knows what it was. The aisle was at an angle. It was an old plane with big wheels in the front. It was a regular passenger plane. I think I had to change planes in Charlotte.

I interviewed at TRW. I had an offer from Chevron. I did not go out to see them either. I had an offer from somebody in—think it was in Alabama—at the space center there. I forget.

ROSS-NAZZAL: Marshall [Space Flight Center, Huntsville]?

HIRASAKI: I don't think it was a NASA offer, but it could have been. Private industry paid a lot better than NASA, and money would have made a difference to me.

Chevron and TRW both offered me $9,100 a year. It was $775 a month. Bought a new car, lived in an apartment in a building on the water. I wasn't on the water. Lived in a new apartment building, a one-bedroom apartment, not an efficiency. But was penniless pretty much after doing that. Bought a '67 Mustang; turquoise frost was the color. That was the spring of my senior year that I interviewed and took the job.

Oh, I know what happened, the Apollo 1 fire. That was one thing that got my attention. I don't know if I was planning to go in the space program, or I already had my job when that happened. I forget what month that was. Duke has that gorgeous chapel that's like one of the European chapels, it's fabulous. I went in, and I was Catholic at the time, so I didn't attend church there. When I heard about it, I went into the chapel, and I walked about halfway in and I sat in a pew. Just the middle of the week, nobody was in there.

I hear this noise, and I look up. They have these big cylindrical lights that are hanging. This light is coming down. I'm like, "Whoa. Okay." I was a pretty religious person at the time,

and I'm just sitting there. I moved over so it would come down beside me instead of on top of me. As the light comes down and I'm looking at it, wondering if it's a message from God, what's going on here. The janitor walks up to change the lightbulb. I don't know if it was a sign from above, but it was truly a strange coincidence. A giant chapel and it came down right on my head. I can't recall. I definitely considered it some kind of a sign. I still do today even though I'm not religious now. I think well, that was some kind of a sign. I just recalled that story. I was headed somewhere else.

I was there at the Manned Spacecraft Center in Houston for all the manned Apollo flights. They were still flying the Apollo unmanned when I started my job.

It was of course a big deal in the country. Everybody was excited. Chris [Christopher C.] Kraft came to speak at Duke. They had a speaker series in the auditorium. He did an afternoon talk with faculty, and one of the engineering faculty members, in fact that guy who I guess was my senior adviser, introduced me to Chris Kraft and I got to say I was going to go to work at TRW. I met him that afternoon. After he spoke that night in the full auditorium, he's signing autographs or taking questions. Maybe just taking questions in the lobby, which is crowded. He said, "Where's that girl that's coming to work for us?" I was just overwhelmed. What press I got from that. It was perfect. Then he had me over to his house for dinner after I came to work.

ROSS-NAZZAL: Really.

HIRASAKI: Yes. Someone in TRW marketing was coming to dinner, and they told him to bring me, so they had me over to dinner at their house. It was probably 10 or 12 people around a big

dining room table. There were some off-color jokes, and Chris Kraft's wife said, "I think we're embarrassing her."

ROSS-NAZZAL: You must have made quite the impression at that Duke event.

HIRASAKI: Yes. I had forgotten about that too.

ROSS-NAZZAL: That's funny. Did you know who he was when you went? He'd gotten a lot of coverage, being a flight director. But did you know?

HIRASAKI: The press at Duke had all that. I knew he was coming to speak. There was a bio, a write-up, and everything there. Yes, I must have known he was a muckety-muck anyway.

ROSS-NAZZAL: Did you follow the space program much at all before then?

HIRASAKI: No. I never watched TV in college at all. We had one in the dorm, and I never watched it at all. I was pretty out of touch, but I had some interest. I must have known what was going on. I don't know if I got a newspaper. I think my roommate got a newspaper.

The coverage before on the unmanned flights was not much. But obviously people were aware of the space program. We were going to the Moon.

ROSS-NAZZAL: Why Houston? What made the difference?

HIRASAKI: That was where the action was, but really it was where I got the highest paid offer. If I'd visited JPL, maybe I'd have made a different decision, but they didn't offer me a job. Nor did they offer me a trip. I thought I had a real good interview with the guy that came on campus, and my professor had said that too. In any event I wanted to be where the action was, and I'm glad I did. Now that I'm out here in southern California—a lot of people worked in satellites—and it's just not the same.

ROSS-NAZZAL: What was it like coming out to Houston? Historians and even people from your generation who worked here talk about how it was really a youth-dominated culture. I wonder if you would talk about that.

HIRASAKI: Oh my, it was. My husband lived upstairs in the apartments. I went out with both of his roommates. He was dating somebody else. I ended up dating somebody else in the building who, oh my God, was 31 years old. Talk about an old man.

I remember one of the guys that roomed with my husband later or maybe he roomed with my husband's roommate, I can't remember. He ended up being a section head at TRW at like age 28 or 26. John was 28 when the Apollo 11 happened, so he was younger than that. He was the NASA person overseeing the building of the Mobile Quarantine Facility. We were young. Yes, it was a very young crowd. My boss was also 31, and his boss was more like 40. I became good friends with my section leader, and his wife was my matron of honor. We used to all go out together. They were older. But that's old.

I did key work on Apollo 13, and I was 25 years old.

ROSS-NAZZAL: You were young.

HIRASAKI: Yes, 24 or 25 years old. They were counting on me to tell them, "It's going to be safe to enter this entry envelope; this way we've never entered." Help them define what's going to be safe. I was the one that had been doing that work.

ROSS-NAZZAL: What did your parents think when you told them that you were moving to Houston and taking this job at NASA?

HIRASAKI: Oh, I don't know. I think they were pretty positive about that. They were horrified when I went into engineering. They just thought that was terrible. My father later on, and fortunately it was after I graduated, he said, "Well, I really didn't think you'd last more than a year. I figured you'd get married right away." He spent the money sending me to Duke to find a rich husband. It was the truth. He really had. That was the plan. I married a farm boy who went to Lamar Tech [Lamar State College of Technology, now Lamar University, Beaumont, Texas].

ROSS-NAZZAL: Very different.

HIRASAKI: Yes. I think there were bragging rights to having a daughter being an engineer and working in the space program. My father had said the summer before, "We'd love for you to stay in Charleston, but you're not living at home." I said, "There's no way I'm staying in Charleston." I don't think there was any expectation, but I'm one of five children.

ROSS-NAZZAL: Are you the oldest?

HIRASAKI: No, I'm second. I had a brother who had gone to Duke. There were still little kids at home. We're all spread out, about four years in between everybody. The oldest was 16 when the youngest was born, so they had plenty going on.

ROSS-NAZZAL: That's a big family.

HIRASAKI: They continued to have plenty going on.

ROSS-NAZZAL: Kids do have that way of taking all of your energy for sure. How did you get out to Houston? Did you drive by yourself?

HIRASAKI: No. My brother was getting his PhD at Rice [University, Houston, Texas], and he had a steady girlfriend who he ended up marrying. He flew back for my graduation from Duke, and I bought a new car, and then the girlfriend flew over to meet with the family. We had a week in a beach house in Charleston before I left. Our family, we often rented a house in the summer for a week. Then the three of us drove my new car.

ROSS-NAZZAL: Fun trip. Was it a convertible?

HIRASAKI: No. Stayed with friends in Alabama. We got there in time to be in New Orleans. I remember he had to say, "I'm staying with my cousin and my sister in the motel room." He's a redhead too, so we looked enough alike.

I had already found the apartment when I came for the trip. They were still constructing the building. It was a three-building apartment complex, the Balboa, in Nassau Bay. I forget where you are. The one that's back on the water. Is that Upper Bay Road?

ROSS-NAZZAL: Yes. There's three sets of apartments there. I think I know the one you're talking about. They just updated them.

HIRASAKI: John and I, after we got married, we lived in an apartment on the water for a year.

ROSS-NAZZAL: That's pretty.

HIRASAKI: Oh yes. It was like being on a cruise ship, sort of. You just looked out, and you saw water because we were high enough up.

I was the first tenant. They were just finishing the building, and they let me move in. The workmen were still there. I came, and everything I had was in cardboard boxes. I don't know if I brought them, or I shipped them—maybe. I didn't own that much stuff.

They were still working on them. People had passkeys. I went to bed at night, I took the boxes, and I stacked them from the door to the wall so that nobody could force the door open. Of course nothing ever happened. But there I am, probably my first time sleeping alone, because I always had a roommate or sibling in a room with me.

I probably just came in late in the week and started work on Monday, I guess. June 26th, ’67 was my first day at work.

ROSS-NAZZAL: What was the area like when you moved down to Texas? I’ve heard recollections from different people.

HIRASAKI: Nassau Bay still had some vacant lots but not many. It was pretty well developed by the time I got there. We, the young people, had bicycles. We used to ride through the neighborhood and inspected houses under construction. Back then you could have adult-only apartment complexes. Not too long after that it changed, and they made them allow children. We were living in adult-only complex. The Bay House across the street was adult-only. There was a “Hey, it’s Friday; who’s having the party” kind of vibe. I had a few. That was a very different vibe after people started being able to have children in the apartment. It was a fun atmosphere.

We had a group of people that would cook out every Wednesday behind the Balboa. People would bring their boats and ski. You’d be responsible for one of the Wednesdays for the food. We did that a couple years, I think. I think it was before I was married and after. It was a fun place to be. We all went surfing one time. I had a surfboard. Went to Galveston together as a giant group.

But anyway, probably NASA doesn’t want all that. They want to talk about work.

ROSS-NAZZAL: I find it fascinating. I have an article coming out about the Clear Lake community and how it was built and when people came and what they experienced, and how

NASA contributed to their social life. I'm interested in it. NASA had a huge impact on this area. I think it's good to capture that history. What was your understanding of what you would be doing at TRW?

HIRASAKI: I'd be working on the heat shield. I remember a professor and I looking up ablation to see what the term meant—he might have known what it was—so I could read up on what it was. The heat shield burned off, and that was the ablation. That much I knew. I had met the people whose group I'd be in.

I had worked in the summers at the naval shipyard in Charleston and at one of their contractors in drafting. I'd been around engineering work. It wasn't like I'd never been in an engineering office. I had two summers of working with people that were doing engineering work. That probably made a difference as far as my expectations of what the world of work would be like.

Back in those days, talk about throwing government money around, I had a private office.

ROSS-NAZZAL: Did you really?

HIRASAKI: I did.

ROSS-NAZZAL: A woman having a private office. Wow!

HIRASAKI: Twenty-one years old, private office.

ROSS-NAZZAL: That's wonderful. Did you have a secretary?

HIRASAKI: Our group, we had a group of—how many of us were there? I guess there were six. The boss had a private office. Then the other offices, there were two people in each. I had a smaller office that was mine. They were all guys. You came through a door and secretary was there and then our offices opened off hers. Having been around the space program in the 2000s, I know how unique that is. Having come back to work in the space program, I realize not all the contractors were like that, but the TRW building was like that. Our section moved, and I ended up sharing an office with somebody, but it was a big office. At one point I was in an office, there were three of us, but there was still that privacy of having an office with a door. All of the engineer offices were off of a central place where secretaries sat.

ROSS-NAZZAL: The TRW building, that was also in Nassau Bay?

HIRASAKI: Yes. They're the white buildings, first street in on the side away from NASA 1. They built another building while I was working there, so they had four buildings, I think.

ROSS-NAZZAL: A lot of those buildings have been demolished now. I don't know if you've been out here.

HIRASAKI: Yes. Once you depreciate them, sometimes—even though the building looks fine—investors are better off. It's been 10 years since I've lived there. I don't think we were driving

around in that area when we've gone back. We've gone back a couple times. John's family is in Texas. We haven't made it back much, but we live in a good place. People come to see us.

ROSS-NAZZAL: You live in a nice area. We're a little warm these days.

HIRASAKI: Has been a good place. We were right across the street down there, convenient to get to NASA.

Workwise, I walked into a computer program already developed that I just used and I made data changes to, but I did not make programming changes. I did not develop the computer program that I was using.

ROSS-NAZZAL: Would you talk about that? What was your role in terms of the heat shield?

HIRASAKI: The heat shield, I'm the one that did the locations. I divided the heat shield up radially labeling the radials H, I, J, K, etc. Then we picked spots based on data we already had. It wasn't that we checked everything. We already had unmanned flights where they tested the heat shield and returned at a certain angle. The ablation and the depth of material that was left, we had all that data.

That's what we would work every time there was a flight. I was there for unmanned flights. We'd get the data, and then we'd massage the program. I can't remember what we would have changed, or I would have changed. We had people at NASA working with us too or overseeing what we did.

I can't recall what the other people in my group were doing. But I know I was the one that was choosing the spot that we thought was going to be the hottest spot. Oh, it's not. Okay, well, let's move the data so that when we run our program that predicts the hottest spot. We'd know where the hottest spot was. We'd adjust the program in order that the program would say that was the hottest spot. Then we could believe the program.

We were matching the computer program. I hadn't really thought through that lately, but that's what I was doing. We were getting the computer program massaged to the point that we could believe it, and that it would match what the experience actually was.

Then every time they flew, they would take cores out of the heat shield so we'd have the measurements and we could compare with the computer, so we still adjusted it for quite a while. We were through doing such work by Apollo 13. Apollo 13 was a whole 'nother thing.

ROSS-NAZZAL: Interesting. Do you remember who you were working with at NASA? Were you working with Dottie [Dorothy B.] Lee?

HIRASAKI: Yes. I was going to tell you that. Dottie Lee was like the group leader and Emily [W.] Stephens, an older woman, reported to her. Emily had been a high school English teacher or something really unrelated. Emily Stephens was directly over our work with George Strouhal and Don [Donald M.] Curry. Don Curry was still there when I worked in the early 2000s.

ROSS-NAZZAL: We interviewed him. That's funny.

HIRASAKI: Yes, he was young. He's 10 years older than I am. I worked with him because I came back and did heat shield work at Boeing in the early 2000s. Don Curry, Emily Stephens, and George Strouhal were our immediate NASA contacts, and Dottie was their boss I'm pretty sure. I knew all of them really well.

I don't recall Dottie going out drinking with the rest of us, nor Emily. Maybe she didn't participate too much. The guys did. Emily had gotten into that position, a very responsible position. She was respected and smart, and she was just as frumpy looking as something out of a sitcom. She really was. Kind of thin and plain, an old lady, old schoolmarm looking. She really was, but there was no dissing or anything. She was respected and treated well and did a good job. Once you knew people there wasn't any kind of guff like that going on.

ROSS-NAZZAL: How did you learn more about the heat shield system itself? You said while you were at Duke you looked up what is ablation and what the heat shield was.

HIRASAKI: They had pretty good manuals on things. We had manuals and information. I'm trying to recall. I've got manuals in the attic, not on the heat shield.

ROSS-NAZZAL: I have a place you can donate if you want.

HIRASAKI: Oh, do you?

ROSS-NAZZAL: UHCL [University of Houston-Clear Lake] Archives.

HIRASAKI: We've auctioned off a lot of stuff. We're leaving the kids a couple of things. John has one of those little silk screens of the Apollo 11 emblem that they all signed. Given to John Hirasaki by [Neil A. Armstrong, Buzz Aldrin, and Michael Collins].

ROSS-NAZZAL: You should definitely hold on to that.

HIRASAKI: We're passing that down. I know I had to write reports. I remember my boss was a really good writer. He would just take a red pencil. I've already told you how good a writer I wasn't at Duke. Because that freshman English was really a writing class, I really learned. I learned a lot from him editing my reports. Apparently, I had to write a report pretty regularly as to what was going on. Engineering was like that.

Before I went into industrial sales the last job I had was in Galveston at Todd Shipyards. It was the National Maritime Research Center, briefly. I had to write. We had to write every week. Maybe I was in charge of writing. I think that's what happened there. I was the engineer who could write.

ROSS-NAZZAL: You improved.

HIRASAKI: Speaking of that, engineers are notorious about spelling and writing and not being good at either, at least before there were a lot of women. But back then that was the deal. My oldest brother and the one four years younger than me both were school spelling champs that went to the county. I was not good at spelling. Twice on posters I misspelled a word. I remember clearly because of all the teasing I received, like I spelled Santa Claus with an E on

the end. I put maybe as one word instead of may be. Anyway, I got all this guff from my family so I always felt like I was a bad speller.

Once I went into engineering, and this is before spell-check, everywhere I worked I was the speller. People would give me that task. I guess it just depends on where you are. As an engineer I am an excellent speller, but in the houseful of spelling champions, well, maybe not.

ROSS-NAZZAL: That's funny.

HIRASAKI: That was quite a shock to find.

ROSS-NAZZAL: Did you handwrite all your reports and give them to your secretary?

HIRASAKI: Yes. She typed them all, and that was before word processing. I left there before people were using word processors. Everything was handwritten, and the secretaries were using Wite-Out.

ROSS-NAZZAL: Different world for sure.

HIRASAKI: Oh yes. I've seen a lot of changes.

ROSS-NAZZAL: You mentioned that you were trying to figure out what the hottest point was for reentry and the coolest point.

HIRASAKI: Not the coolest, just the hottest.

ROSS-NAZZAL: Just the hottest, okay. That influenced or impacted the landing, the reentry?

HIRASAKI: No, we were always saying, "You'll be safe." They weren't trying to do anything that looked like the heat shield couldn't handle, until Apollo 13. Then it was, "Well, we can bring them back in this envelope. You need to refine it more for the heat shield, what'll happen at the extremes." We did have to limit what they were going to do, but I don't recall that it was dramatic. But I did get called. They said they'd got the data. It was the middle of the night when I got the call to set up the program to run. My program was all these boxes of computer cards. It was two boxes of cards. In the front were the cards I'd change. You'd put in handwritten changes on the green sheets where you put in every letter in its little square. The keypunch operator would make your cards. Or we had a keypunch machine we could go to. Often I was just changing a couple of cards, and I would do it myself.

At TRW we would turn the boxes in, and then they'd take them over to NASA. In the morning I'd get back why we weren't smart enough to program it so it didn't get every bit of data. I'd have a stack like this of printout. [Demonstrates] Then I'd go all the way through it looking for peaks. I say my programming ability was quite limited that it hadn't dawned on me that you could capture those, and it hadn't dawned on anybody else either, I might add. You could write it so you could capture those peaks and just get a printout of the end.

In any event, I had all these stacks of computer printouts in my office. I've got two articles that were written in the company newspaper about me, and one of them has got a picture of me standing by these stacks. I'll send you that.

ROSS-NAZZAL: Yes. I would love to see that.

HIRASAKI: Yes. I'll send you those things.

ROSS-NAZZAL: Computers were, they were around, but it's not like people used them that regularly. You would.

HIRASAKI: Yes, there were no personal computers. We got a personal computer, it was the '80s before we had a PC, like '83, '84. We got one pretty early. We got an Apple pretty early at home. At work I think there were terminals in my next job, next engineering job. There was a terminal you could go to and input stuff into a computer directly. So the cards, we were out of doing that. But this wasn't the space program. They didn't change much, because of the safety things. Once it's set, this is how you do it. Some crazy things just don't get changed like computer programs.

I can't remember that night whether I took stuff to NASA or whether somebody else took it to NASA. I went in and figured out what to do and punched out the cards. The program was run, and they ran it pretty quick. Then they could look at what our limits were.

I stayed in thermal for a while. I started working on Shuttle thermal, because MSC [Manned Spacecraft Center, Houston, Texas] was proposing an ablative heat shield for the Shuttle. Parts of it were going to have to be replaced every time, and as you know their concept did not win. But the concept became my master's thesis, so I got a win out of that. I could take my day job and turn it into my master's thesis.

ROSS-NAZZAL: Why did you decide to go back to school at that point?

HIRASAKI: In retrospect I should have gotten an MBA [master's in business administration]. I was doing pretty heavy-duty thermal work. We had a PhD guy they brought in from the West Coast to TRW who was some muckety-muck expert. I think he was old, maybe sixtyish, and foreign-born, so he had an accent. Tony Arico, I think. He was a crazy little man, but he was really brilliant. I was the person that could get along with him and put up with him. The guys just couldn't tolerate him. I became like his assistant for a good while, for maybe a year.

That must have been the Shuttle work, but I can't recall if it was Shuttle. It probably would have been. It would have been something new because they had him transfer in. I forgot about that. He was an odd duck but a nice guy. Sometimes you run into those in the scientific community. I enjoyed him, and he just drove other people crazy. I worked with him on that.

Then after the Apollo 13 explosion, and I don't know the timing on this, but it had to have happened pretty quick because I don't know what the delay was before they flew Apollo 14. Do you know that?

ROSS-NAZZAL: I would have to go back and look at the dates. That was what, April of '70? I think 14 was in February of '71.

HIRASAKI: Yes. Almost a year. I'm losing track of when I worked with Tony Arico, and when I did this.

The other engineering project I did, I got teamed up with someone from another group, a thermal guy. My senior by a few years but not many. Also an odd duck. Later on I interviewed for a job where he was working, and they said, "What do you think of him? We just wanted to see what you'd say." I wasn't alone in my opinion.

But anyway the tank that blew up in the service module, the oxygen tank, had a stirrer in it. They were going to take it out because they thought that might have been the source. They wanted to know what the temperature gradients in the tank were. We built them a math model of the tank and predicted what the temperature gradients would be, and they decided they could do that without stirring. That was the change they made I assume before they flew again. I can't recall how long we worked on that together.

I was probably going to graduate school at the time. I got my degree in December of '71. I went to U of H [University of Houston] for graduate school.

ROSS-NAZZAL: I looked up your thesis just to see if I could pull it up but it hasn't been digitized yet.

HIRASAKI: Oh yes.

ROSS-NAZZAL: I was curious about the TPS [thermal protection system] that you were working on.

HIRASAKI: Yes. I probably still have the book. I don't think I threw it out. But then again moved a couple times; I expect that's one that's lasted. Yes, but I haven't opened it in 45, 50 years probably.

ROSS-NAZZAL: It's important.

HIRASAKI: Oh yes. We're trying to save stuff. I did a book about John during the pandemic. I said, "Well, if I die." Because if you recall us old people were thinking, "Well, this is it, I could die." It's crazy but we did. What do I need to do on my list of things to do? I did a picture book with a lot of writing in it, a 23-page book that somebody could take to school for show-and-tell, which is what's happening with it. He gave a whole bunch of copies out. We're from an enormous family. I had 50 copies made.

ROSS-NAZZAL: That's great. I'm trying to collect memoirs for the archives. If you have a spare copy, feel free to send one.

HIRASAKI: I can just order one for you.

ROSS-NAZZAL: Or if you have an electronic file that also works too. We can do that. I'm just trying to keep them because they're good resources for us to have. We never know what people might ask. It's kind of nice for us just to pull something off the shelf and say, "Oh, well, here's those details."

HIRASAKI: I wonder if there's an electronic file. I may.

ROSS-NAZZAL: I can work with an electronic file.

HIRASAKI: Write myself a note to do that.

ROSS-NAZZAL: I think in your write-up you had mentioned you were in Mission Control for Apollo 13. Is that a role you would regularly play?

HIRASAKI: No. It was Apollo 17.

ROSS-NAZZAL: That was 17, okay. I thought I had read that you were there for 13 as well.

HIRASAKI: No, I wasn't there for 13. At some point I think it was probably right after I got my master's degree. They transferred me out of thermal. I'd taken all the thermal courses. My master's degree was heavily weighted. Every thermal course they offered, I had it.

They transferred me to guidance and navigation. I don't know if I spent more than a year there. That's when I shared an office with two guys. That was an odd thing. We had to prepare stuff for the specific mission. We had to get it to them by a certain time. Then we had to wait for them to fly. I think we probably got some data back after the mission, but we had all this dead time. We sat in the office with the door closed playing hangman on the whiteboard. It was just tons of dead time.

That happened to me on the Shuttle work. I hired back in on Shuttle in 2004, worked for three years, and we got it so we can predict what'll happen if the heat shield is damaged. That's the work I was hired to do. They flew, and then I forget what happened on that flight, but something terrible happened. All of a sudden, we're down for another year. Then we really did have nothing to do. It was just terrible.

Some of the Boeing guys, I think somebody gave me something to do. I forget what I was doing during that time. But I noticed they gave it to the contractors, and the Boeing people sat there with nothing to do. I'd rather have something to do than that, but that's not that grand. Back then we sat there with nothing to do. But when Apollo was flying, guidance and navigation had the work that needed to be done. Then you had to wait till they flew. Or you had to get it to them in time and then they didn't need you to do anything, so it was pretty inefficient at that point as far as dead time.

On Apollo 17 I had the hand-drawn graph I took over to Mission Control. "All right, this is the time he saw the crater and then this is the time he saw it next." I forget what it was. It was crater tracking. Landmark tracking on the Moon they called it. That's what it was, landmark tracking on the Moon. Then I went to the chart and figured out what their altitude was.

Then I started looking for a job because Congress pulled the plug and everything was shutting down. They did keep me to work on Skylab, but I quit. I found another job, and I left.

ROSS-NAZZAL: You went into an interesting field. Was it maritime that you went into?

HIRASAKI: National Maritime Research Center, yes. It was engineering work. They were trying to have oceangoing barges, barge trains. I remember one of the older guys saying, "They're

going to find out you can't push a rope." That's pretty much what they found out. I was there a couple years. The center also was letting people go and going down when I left there.

By that time we'd had a computer salesman come in. Got us on those terminals. Set up that terminal with the mainframe and that operation started doing word processing. He would come in, and I'd talk to him. I thought, "Oh, I'd be good at that." I got a job doing that. I went into sales, where I'd go to people's offices. I was selling completely different stuff. I was selling pipe, valves, fittings. It was great for me, because I was out and about. I'm friendly. Take guys to lunch, take them to the ball game. Married to someone who didn't care if I did. I had a 30-year career. Became an executive along the way in that. Wasn't out selling the whole time, but that was the avenue I went.

Sold a company, went back into oil and gas as, I guess, an international product manager. They hired me as national sales manager, international product manager. Then I quit. I had sold my business. It was just not a good situation. I got fed up with them. I didn't really need to be working.

Then I ended up sitting by somebody—the contractor John was working for at a Christmas banquet or Christmas dance. He said, "What kind of work do you do?" I was telling him what I'd done. "Oh, you did thermal work." That was after the last Shuttle accident [STS-107]. I went, and I took a five-year job contract. I said, "I'll stay five years," and I did. They said, "You can't leave, the Shuttle is still flying." I said, "I'm going. Watch me."

I wish I'd gone back to space a lot sooner. Really the atmosphere is so much better than the private sector was. I was in the oil and gas industry and Halliburton.

ROSS-NAZZAL: How was the work environment so much better? Can you explain?

HIRASAKI: Yes, people cared more. I expect a lot of that is manned space or astronaut-connected. The work atmosphere is more cooperative in the space program. Somebody told me one time it's kind of like being in research at a university instead of being out in the cutthroat got to sell this, got to make this, world. It's a bigger thing than making the profit, at least in the positions I was in. I went back to being an engineer the last five years. I said, "This is fun. It's like playing computer games all day." I was building a math model of the Shuttle for the first three years.

ROSS-NAZZAL: Oh, math models. Really.

HIRASAKI: Yes. The main landing gear door was my model. I think I spent about three years doing that. Then I was operations lead on the damage assessment team. That was exciting. Fly, and we'd look at the damage to the heat shield, and then decide whether they could return or not. They always could but that's because they had taken care of some of the problems that had caused the crash in the first place.

ROSS-NAZZAL: What was the math model needed for for the landing door? What was the purpose of that?

HIRASAKI: It's the heat shield. If the heat shield is damaged there.

ROSS-NAZZAL: Oh, I see, if it's damaged.

HIRASAKI: We didn't have anything. If the heat shield is damaged here, we don't have any way to tell what would happen. Is it safe to come back with that hole in the heat shield? Who knows? That's where they were. That heat shield had worked, and it had been a couple decades since it had been developed. They really didn't have the thermal staff they needed.

I was a good fit for that work. Like I said, it was fun for me. I was glad I did that.

ROSS-NAZZAL: Did you come back and work with Don? I think Don was working out at Building 222 at that time.

HIRASAKI: Yes. I worked in the big Boeing building on Bay Area Boulevard. The giant building as you're leaving going through the woods almost.

ROSS-NAZZAL: I know which one you're talking about.

HIRASAKI: Originally the IBM [International Business Machines] building. I was in a building in Webster, but then I spent most of the time in that big building.

I just worked five years. It was exactly what I told them I'd do. It was interesting work. It was good. Socking more money away for retirement.

ROSS-NAZZAL: That's always a good thing. How had things changed since you last worked for the space program?

HIRASAKI: I wasn't the first woman in my job. There were plenty of women around with good jobs, not that many in management though. Muniz Engineering was the contract I was on, but I wasn't alone; there were other women. That was different.

We were in cubicles. We did not have our own private office. God forbid. We were in cubicles. They'd all tell tales of the time they put them in a big room on long tables and had them sitting across from each other and how horrible that was. Most of them were glad for the cubicles.

ROSS-NAZZAL: At least you have a little privacy.

HIRASAKI: Yes. We had a definite job to get done.

ROSS-NAZZAL: Oh yes.

HIRASAKI: I think the Boeing guy, the technical guy that was over our team, was great. Smart and nice and super. I can't even think of his name now. That was good.

My first immediate supervisor had a nervous breakdown. It was a woman. She had had to go to KSC [Kennedy Space Center, Florida] and view the recovered pieces of *Columbia*. The heat shield people were sort of responsible for the crash, and she had had to go to look at the debris. She ended up working in another area. I didn't come on until afterwards. The guy that had warned them was kind of a jerk, but any time he spoke up in a meeting everybody got quiet and listened.

ROSS-NAZZAL: I bet.

HIRASAKI: He got a lot of respect after that. Glad not to have been a party to the accident because there was anger and guilt from it as you can imagine.

ROSS-NAZZAL: You mentioned you were working on that model for the landing gear door. Computers I imagine had changed quite a bit. How did you come up to speed on creating models and doing all of that math?

HIRASAKI: Even though I left, I ended up selling really technical equipment that the customer couldn't buy without us telling them what they needed. I was in computers so I stayed with computers through that career. I had periods of time when I was management, and I didn't do anything but maybe a spreadsheet. Even in the oil and gas industry I had to run computer programs; do calculations using a computer. I always was up-to-date or up-to-date enough. In fact when they hired me, they said, "Well, we use." What's the name of that program? It was just a version of the program I'd used on Apollo.

ROSS-NAZZAL: Really?

HIRASAKI: They designed the heat shield not too long after I left. I earned my master's degree in '71. They had a new version of it but you could see the way the columns were done. They were doing two programs, but I had used the other one too. So they had the old programs. That was funny.

ROSS-NAZZAL: That is funny.

HIRASAKI: You could see the way the data lined up when you put it in. It was like you were doing a keypunch card. On one of them we didn't use as much, but it was really funny to have that. They mentioned both programs. Oh yes, I used those. When was this? This was like 2004. Yes, because I retired in 2009.

ROSS-NAZZAL: Any memorable missions? I know there were a couple there that they had some concerns about reentry of the Space Shuttle. Were you involved in some of those missions? Like the gap fillers?

HIRASAKI: Until I left, I was worked every flight because I was on the damage assessment team and became the Operations Lead after they returned after that one break. We flew and then something went wrong, and they waited. They had to fix it. It wasn't us. Wasn't heat shield. Forget what went wrong. Might have been a launch thing. It must have been after we flew again that they put the damage assessment team together. In my attic right now I have a garage-door-size picture of the bottom of a Shuttle cut up into squares. We would have that in the conference room over at Mission Control that we used for the damage assessment team. That'd be up on the wall. We'd point to wherever there was damage.

Before the *Columbia* crash, we didn't even have cameras to send out to look and see if there was damage. There wasn't any inspection process prior to that crash. The new process was they'd take a picture before launch and then we'd watch videos. While we were watching

the videos from the launch, as long as they were there, we could see if anything hit the heat shield.

We'd get images from the camera that we could tell where there was damage. Then we'd run programs to see if that was okay. I don't think they ever needed to fix anything. I don't think so. I didn't work the last year or so, but I was friends with people who did. Like I said they'd taken care of the problems with the ice and the damage done at launch that I heard people rant and rave about. We kept telling them, "You can't do that."

ROSS-NAZZAL: It's important work, that's for sure.

HIRASAKI: Yes.

ROSS-NAZZAL: I did want to go back and ask you some questions about John and then also about women in TRW and the women's movement because I thought it was kind of interesting. You and John married what, in '69? Is that correct?

HIRASAKI: End of '68.

ROSS-NAZZAL: End of '68.

HIRASAKI: December.

ROSS-NAZZAL: What did you think when John came home and told you that he was assigned to be in the Mobile Quarantine Facility?

HIRASAKI: I guess I knew that there was a chance because they were the practice astronauts in quarantine. He'd already been in the quarantine facility with two of his working buddies. Even though John was the project leader, that's not why he got it. He got it because the guys working on the project drew straws. [Brock] Randy Stone went in on 12.

ROSS-NAZZAL: Were you concerned at all for his safety? Were you concerned about lunar bugs?

HIRASAKI: No. We laughed. They had body bags in there.

ROSS-NAZZAL: Yes.

HIRASAKI: Yes. They had four body bags, and they said, "Well, the fifth guy is not going to be able to zip himself in if he dies." Since the astronauts had a few days on the return flight that also gave you a level of comfort. If they were still healthy you were probably in pretty good shape. I'm sure that buffer mattered.

ROSS-NAZZAL: Did you go to visit John when he was in the LRL [Lunar Receiving Lab]?

HIRASAKI: I did.

ROSS-NAZZAL: What was that like?

HIRASAKI: They had a room with a glass windows into another room. It was almost like a classroom on my side. I think it was probably where the press came. There were desks on the other side, probably somebody's office when they weren't having visitors.

A lab technician got exposed when a glove blew a hole. It was a woman, and she went in. I started asking him about it. We'd been married about six months, and he says, "I'm in here with 30 something guys and 1 woman. You're out there with the whole world, and you're jealous."

When they let them out, I went over there and met him, and I'm still mad. I wasn't conscious of the TV coverage, since we were there in the hallway getting reacquainted. By the time we came out the TV had cut off. "We kept waiting for y'all," said my friends and family. I missed my chance.

ROSS-NAZZAL: That would have been good coverage for your family.

HIRASAKI: Would have been good coverage for people I went to college with. Everybody was watching. Few knew.

ROSS-NAZZAL: Oh, that's funny.

HIRASAKI: I had real long red hair. I was very identifiable.

ROSS-NAZZAL: Poppy [Frances Northcutt] got a lot of attention because she looked a certain way. Did you get much attention?

HIRASAKI: Yes, but she did an ad for Dewar's Scotch. She was in top magazines. That got her fame. She was over in Mission Control, and I wasn't. I was just at TRW. I'm sure I was noticed.

ROSS-NAZZAL: I was wondering about that because I've come across a lot of articles lately about women from the '60s and in the space prog—people keep finding them. I was curious if anyone had sought you out.[1]

HIRASAKI: I majored in engineering so I'm used to being the only girl. I just never had a problem even in sales. I grew up with brothers. I just have a way of interacting with men that can keep it on that level without any problem. When the Me Too movement came along I said, "Nobody's going to believe I don't have a Me Too story, but I don't have a Me Too story."

I told John. "Nobody ever tried anything with me. You think they were afraid of me?" He said, "Yes. I think so." One guy was an engineer I used to sell to. Something came up one time. It was decades ago, back when I was young and pretty. He said, "You know, you come in, you ask about the wife and kids. Who's going to make a pass at you when you're doing that?"

[1] For the building dedicated to the Women of Apollo, the ex-wife of an engineer I shared an office with told someone involved that they should look for me. Found me thru LinkedIn. I did not come for the dedication but my photo is in the building with the caption "Parrish Nelson Hirasaki, MSME Heat Shield Specialist."

I don't know. I credit the brothers. I didn't have a sister till I was a teenager. I credit the brothers and that environment for setting me up real good for keeping it at the right level. I think I did go to one fraternity party with an engineering guy, but we were senior year students. We were friends. I never did date anybody at Duke in engineering. One guy said, "Oh, we'd never hear the end of it if we took you out." I dated football players. I wasn't into the nerds. I ended up marrying a nerd.

ROSS-NAZZAL: That's funny. How did you meet John? You mentioned that he was in the apartment complex.

HIRASAKI: He lived upstairs. He was dating somebody. I went out with both his roommates. Those were simpler times when it came to relationships. I was just friends with the three of them. Then I started dating Paul, who was also in our building. He was older, divorced and lived alone. Dated him for about six months. He dumped me. My mother said, "What happened to Paul?" I said, "He dumped me, that's what happened."

Then John and I ended up getting together. It's one of these group things. Just clicking. We got married six months later. People got married fast back then. I was a year and a half out of college. I'd known him a year and a half, but we hadn't been dating. We were engaged after we'd been dating three months with a wedding date set.

All my friends were single unless they ended up marrying somebody they went through college with. But once they were adults and they met somebody, they got married back in those days. That's when people didn't live together.

ROSS-NAZZAL: You had that interesting quote from that ABC special that I thought was interesting about your mom. How she was thinking about making dinner and you were like, "Oh my God, that's going to be my life." Before you got married were you thinking maybe marriage wasn't for you? That you didn't want to be responsible for those things?

HIRASAKI: No, I wanted kids. I wanted a whole lot of kids. You see I only had two. That first one cures you real good. I had a bear of a first child. If he had been a she, I am not sure I would have had a second one. I did want a daughter. We have a son and a daughter. Most people are probably knocked over by their first child. No, I always was planning to be married. At college I was actively searching. I was actively trying to get married. There wasn't anything more important on my agenda.

But I did think I wanted to be an astronaut. Everybody did who went to work in the space program. That was just one of those things. You dug in. Most everybody had that idea. They weren't accepting women astronauts back then.

I sat with Shannon [W.] Lucid, one of the first women astronauts, one time at a wedding reception; we sat with each other at the table. She's exactly my age, and she lived across the street from the couple whose child was getting married. I knew her sister had moved in and took care of her kids. I said, "I always felt like I didn't have a chance to be an astronaut because of my age. You screwed that up for me. But in reality I really don't have a good personality for the work." She said, "Oh, you'd be surprised by the personalities."

But once I had a child, I would never have risked my life the way other women did.

ROSS-NAZZAL: I was wondering if you thought about applying in ’78 when they made that announcement.

HIRASAKI: No, as I said, once I had a child I would never have risked my life.

ROSS-NAZZAL: I did want to ask you about Poppy. She had mentioned you in particular, how when you were hired you two got together and formed this team to work for women’s rights, to improve things at TRW for women. What are your recollections?

HIRASAKI: Yes. It wasn’t right when I was hired. She worked in another area. I knew who she was. It really wasn’t until much later because I remember clearly, and it’s probably more of a blur to her, because it was right when I was getting my master’s degree. It really wasn’t until several years after I had worked there that I walked up to her and said, “I’m finishing my master’s degree, I’ve got time now, and I’m interested in women’s lib.” She said, “Oh, come to a NOW [National Organization for Women] conference.”

The first thing I went to with NOW was the national conference in Los Angeles. I didn’t even go to a local meeting. I came out here and went to the national conference. That was quite a baptism. But I’d always agreed with everything. I just didn’t have the time because I was working and getting a master’s degree.

One of my professors tried to get me to go for a PhD. There’s no way I’d have done that. I said to John, “Dr. So-and-so asked me if I’d like to go for a PhD. What do you think?” He said, “Well, you can get a PhD but you’re going to live in a dorm.” He’d been looking at the top of my head across the kitchen table for a couple years, and he’d had it.

Poppy was active in NOW. She and I pushed TRW, though they were a pretty cooperative company. They made me the female representative and a Black man the African-American representative for their whatever committee.

My recollection of all that: I even saw the head of TRW socially. Somebody had us to dinner, John and I and he and his wife, so we spent a whole evening together. He was a great guy. But I do recall being in a meeting, and the head of HR there was a horrible man. He was a horrible man. We were supposed to have a meeting about pay. He was supposed to bring a graph that had all of the male and females on it or members of the technical staff. He brought a graph with four points on it, one female, which was Poppy, and three males, and showed that she made as much as they made. I remember saying, "Well, you certainly have an ace up your sleeve," because I wouldn't be on that graph.

Later on somebody said, "Well…." They felt like I was just concerned about my salary. I was just in it for me. There were other women working there. I wasn't the only female. In fact I had graduated with someone in electrical engineering who was there. She probably wasn't still there. She didn't stay. That still annoys me to this day. Harry Connor was the man.

I don't know that the committee made any difference. Nothing got done. It was probably not too long before things started downsizing too. Then I got active in NOW and I became president of the local organization. We were a pretty good-sized group. We'd have 40 people at a meeting. We ended up renting a building, a women's center, on Southwest Freeway at Richmond Avenue for several years. They probably still had it when I had a baby and still worked in Galveston and no longer came to meetings. As far as doing anything, I just dropped out once I became a mother. I was working full time.

ROSS-NAZZAL: What attracted you to feminism? Was that the way you were treated? Or this was just an idea that you read about and it clicked?

HIRASAKI: Yes, because I'd been in the male environment, and it was ridiculous. I just didn't think women were given the opportunities or treated right. I didn't have any particular grievance other than I knew pay was a problem.

I think I put in there about interviewing for a job at division of National Lead, and the guy saying, "We really like you, but I can't pay you more than any of the men. If they ever found out..." Whereas I was more experienced than many of the men working there. I could have reported it to the EEOC [Equal Employment Opportunity Commission], but I had just closed my company (my first) and had a new baby. At the time I just needed a job, and I didn't take the time to turn him in to anybody or complain. Did some of that when I was at NOW—helped people file actions against companies for wage discrimination.

ROSS-NAZZAL: That's pretty amazing.

HIRASAKI: None of it with aerospace. I should have read what I sent you. I don't want to retell stories. The local gas company there in Houston, they sold gas appliances; they probably still do. They had two departments: they had a department of men and they had a department of women with home economics degrees. They paid the men more. The women had to have a college degree in home economics. It wasn't the EEOC. It was the Wage and Hour Division of the Department of Labor that we were able to go to with that one.

We could keep her name out of it. I remember her telling me, "My boss said, 'Who would have done this to us?'" She said, "Can you believe the nerve? But I don't know, he might have been trying to see if it was me." That was a successful event there.

Then we got the *Houston Chronicle*, this was all NOW, to quit having male help wanted ads and female help wanted ads by filing over 400 complaints with the EEOC against the advertisers. It wasn't illegal for the *Chronicle* to have the columns, but it was illegal for anybody to run an ad in a column like that. We settled. We promised not to take any publicity from it. We won, that was fine. That was great.

We sent out a press release that we were filing the complaints. I had a stack—it's almost a ream of paper, 400 complaints. We filled in the name of the company and pasted a copy of their ad on our complaint form. I delivered them to the EEOC on Monday July the 3rd, a day when nothing else was happening. We hadn't planned it, but because of the slow news day, we got good press coverage. The *Houston Post* was still around at the time, and they did an article plus a local TV station sent a reporter to interview me outside the EEOC Houston office.

ROSS-NAZZAL: You said that you rented a building along the Southwest Fwy in Houston at Richmond Avenue. You must have had a large group.

HIRASAKI: It was a house that had a billboard in the yard, so it was a pretty run-down house. The main drag. You know how Houston is with no—

ROSS-NAZZAL: No zoning.

HIRASAKI: No zoning. Yes. It was just a regular little three-bedroom house that we would have meetings. It wasn't big enough for us to have our real meeting. But we had—what did we call our work groups? We had different committees. That wasn't the word we used. Different things we were agitating for: reproduction rights, employment, and childcare.

ROSS-NAZZAL: I found in one of the newspapers that you gave a talk called "Good-bye 8 to 5, Good-bye $2.25." Do you remember giving a talk on that subject?

HIRASAKI: No.

ROSS-NAZZAL: It was just a little blurb on The Portal to Texas. I typed in your name just to see if anything came up and I thought that's interesting. I think it was in '76. You also said you went to the Texas Women's Political Caucus.

HIRASAKI: Caucus, yes, I remember going to Austin to a meeting. Did Clare Schweickart go with me? I remember taking an astronaut wife, Clare Schweickart, with me to something, but it might have been to the Democratic Party Texas Convention. Anyway, Texas Women's Political Caucus, that probably wasn't where she and I went.

It was like the founding meeting, but I was never key in that. Poppy is still active in that. She got me back in it before I left Texas. We got the Equal Rights Amendment passed in Texas.

ROSS-NAZZAL: You were really active.

HIRASAKI: Yes, there was a lot to do. There was a lot to choose from. TRW was really cooperative. They let us print stuff, and we printed out a bunch of bumper stickers about abortion.

ROSS-NAZZAL: Wow, that would not happen today.

HIRASAKI: Because of what they were on, the paper, they didn't dry right away, so we had to spread them out all over the reproduction room. We did it at lunch. Lunch was over, and they still weren't dry. We couldn't stack them together. We were so afraid somebody in management was going to come by and see them. I forget what they said. It was not something simple like NOW. It was definitely something about abortion.

ROSS-NAZZAL: They seem to be a pretty progressive company.

HIRASAKI: Yes, they were. They really were. Like I said, people were young. Yes, they were progressive. They sent me out to do interviews looking for women and minorities at one point. I only did it once and then they realized we can't send a rank-and-file engineer who doesn't have any authority to hire, or it's a waste of time. They went back to Duke pretty regularly. They hired me and Lindsay Robinson who was an electrical engineer, my year, and we're still friends. In fact I just texted her yesterday. We had a gap where we didn't see each other, but we've been in touch for about 20 years now. She didn't stay in engineering. I got her interviewed.

Duke did an article on her and me and Julie Isherwood, who was a math major, who hired in the next year, along with someone else who was a math major from Duke and who was

African-American female. So TRW was looking to hire a diverse workforce. When they laid almost everybody off, they kept this Hispanic guy to work on Skylab. They'd gone to an effort to get women and minorities. They were trying to hang on to us.

I think they felt like they were doing the right thing. It wasn't like, "Well, we got to do it because of the government." I didn't get that feeling ever, but there might have been some people felt that way. But you didn't feel that way about your job. I never heard anybody say anything about anybody else. They found good people.

ROSS-NAZZAL: I was amazed. Poppy had mentioned the work she did for the city of Houston and how TRW had paid the majority of her salary so she could do that work.

HIRASAKI: Oh yes.

ROSS-NAZZAL: She was up there, which I had not realized.

HIRASAKI: I didn't know about that happening. I forget when she left TRW. She went to law school. I stayed active in NOW until my son was born. When I left the space program I went to work in Galveston for a few years. I remember being president of NOW and saying, "Look, I got to get on the freeway for Galveston." We were in downtown Houston at a U of H meeting, because we were a big group. We needed a big room. We had a big room at U of H where we'd meet downtown or on the main campus. I said, "I got to be on the road at 6:15 to get to Galveston or whatever, 6:30 in the morning. We got to wrap this meeting up."

ROSS-NAZZAL: Were there other women representing NASA or the aerospace companies?

HIRASAKI: No. I can't think of anyone but Poppy and I, but it's not like there were a lot of women.

ROSS-NAZZAL: That's true.

HIRASAKI: Emily was pretty old. Dottie had kids. No. I can't think that there was anybody but she and I that were active in it. Like I said, about a year, year and a half, after I became active, I went to work somewhere else, but I'd have known if someone came in that was in aerospace.

ROSS-NAZZAL: I just wanted to ask you a couple more questions. Looking back over your career in aerospace, what you think was your greatest accomplishment.

HIRASAKI: I'm really proud of helping on Apollo 13 and having the knowledge and the ability to do that. I was a small cog, but I was important that night.

ROSS-NAZZAL: They came home safely.

HIRASAKI: That's right. I used to tell that story back when the movie came out. I used to do a lot of programs for career day in the schools. I'd always do that. I would use Apollo 13 as my base story. I'd say, "And I guess you know I didn't screw up." But then it got so people didn't know what Apollo 13 was.

ROSS-NAZZAL: I'm sure there were a lot of people who saw that movie and wondered if it was fact or fiction.

HIRASAKI: Yes. John was around, and I was around. You never saw people like us in the movie. I would say that about it—all the NASA engineers were not white men. I'm hard-pressed to think of anyone besides John and Al [Albert Y.] Ong.

ROSS-NAZZAL: That's always a big question, people working on film especially. They recognize the diversity of the American population now, and they always want to capture the diversity in the room.

HIRASAKI: It wasn't very diverse. I can't think of any African American, so I said the woman that came to work at TRW the next year. There was the guy that was the minority representative, but there weren't too many on-site at NASA.

ROSS-NAZZAL: What do you think your biggest challenge was while working as an aerospace contractor?

HIRASAKI: I can't think of anything. I felt I was capable of what I was asked to do as far as my level of confidence getting stuff done. I was rarely the final person about anything, but I had confidence in what we were doing. We worked some long hours, but that wasn't any big deal.

ROSS-NAZZAL: That brings to mind another question I forgot to ask you. What was the dress code like for you when you worked in the ’60s?

HIRASAKI: They finally let us wear slacks in probably—I think I was still in thermal. Maybe it was 1970. They had a secretary to one of the department chiefs talk to the women and explain the policy. She said, “If this suit had slacks that would be acceptable.” People still dressed pretty formally. The guys wore ties, or I think they did. I know John wore a coat and tie a lot back then. He wore a tie for a good many more years in the space program. I remember people being snitty about my first talking about that, but it was needed. I made all my clothes back then. I can remember outfits I made and wore that would have had a jacket, but I’m hippy so I would cover my hips with something.

We were allowed to wear slacks then, but I think they were on top of the guys about what they wore too. It was a different time, but they still had the expectation that we would dress up.

ROSS-NAZZAL: Things have changed.

HIRASAKI: Yes. Hasn’t been that long since I was there. Boeing telling workers not to wear jeans. A male co-worker related that he got into the elevator with the guy that told the staff not to wear jeans while wearing jeans. Nothing happened about it. I didn’t wear jeans to work. When I went back to work in the space program, being an executive was the last work job I’d had. I had suits. Being an executive in a men’s field I always wore a suit. I was overdressed for a long time.

ROSS-NAZZAL: In a sea of khakis and polos.

HIRASAKI: That building was cold too so it didn't hurt that much having suits. It was a more casual work atmosphere when you're just not seeing the customer, when you're not in charge of a whole bunch of people and needing to look like you are in charge of them. Until I went back in the space program, every job I ever had I was the first woman that they put in that position. At TRW they didn't have any engineers in Houston until they hired Lindsay and me from Duke. Poppy didn't have an engineering degree.

ROSS-NAZZAL: Was that a challenge for you being the first woman?

HIRASAKI: I don't think so. When I went to work in Galveston, they had a woman who had been a physics major who was weird, and I got to be friends with her. Just truly one of these off-nominal people. They told me later they were afraid to hire me because of her. After that happened, I have always tried to be careful not to hurt the path for the next woman. Then I ended up with men working under me, over men who were over men kind of jobs. One time I had a position where I was over men who were over men, and it was more of a manufacturing environment, not a sales environment, manufacturing and product distribution. We'd have a quarterly meeting. We were having a quarterly meeting of the managers. I had eight departments in five states, so there were eight male managers in this room with me. We took a break and when I came back there was a fistfight going on between two of my managers.

ROSS-NAZZAL: How did you manage that?

HIRASAKI: They were embarrassed.

ROSS-NAZZAL: I've never seen that at work.

HIRASAKI: As I said this was the manufacturing distribution crowd. This was not necessarily a college-educated bunch.

ROSS-NAZZAL: That's crazy.

HIRASAKI: Oh, I know. That's the only one. It had nothing to do with me. Just is funny.

ROSS-NAZZAL: I wonder if there is anything else you wanted to talk about today. I'm looking to see if I overlooked anything. I think we hit everything.

HIRASAKI: I don't think so.

ROSS-NAZZAL: Glancing at my notes.

HIRASAKI: I don't know that I gave you anything worth anything as far as the space program goes. Hopefully you can use it for something else.

ROSS-NAZZAL: Like I said everybody's got a story. It's great. There's great information in here. I did want to ask you. Did you ever get a chance to go out to Avco and see the heat shield in person? Is that something you ever did working for TRW? Weren't they out in Massachusetts? Did you go out there?

HIRASAKI: No. I didn't go. I never saw the heat shield. I'd see it when they came back over at NASA.

ROSS-NAZZAL: You'd see the char.

HIRASAKI: Yes. I might have seen it. They'd bring it back. I think they'd bring it back to Houston. I wasn't physically around stuff. When I did the Shuttle, I did take some trips to Florida and climb around in the Shuttle and physically look. I don't know if that's why I was there, but I think so.

But no, we didn't have a lot of product; we looked at pieces of the heat shield. I can't remember what I've seen in museums and what I saw in real life. Certainly I've seen it in museums a lot.

ROSS-NAZZAL: That is something that is intriguing I think to a lot of people, how that worked.

HIRASAKI: Yes.

ROSS-NAZZAL: Thank you so much for your time today.

HIRASAKI: Thank you.

ROSS-NAZZAL: I appreciate it. Really enjoyed it. Enjoyed hearing about your experiences and hope you're enjoying retirement.

HIRASAKI: Yes, I am. I'm an artist now. See? [Points]

ROSS-NAZZAL: Oh. I did see that.

HIRASAKI: I finally got to be in art. When I elected to be a math major, I thought I'm going to put art off until I retire. I didn't put it off that long. I took it off my plate until my kids were out of the house. But as it turned out I've had 20 something years of art. Just a hobby. It's fun.

ROSS-NAZZAL: It's amazing stuff. I was looking at some of the paintings online. They were very impressive. I would not be able to paint anything like that.

HIRASAKI: It's worked out to be a good way to meet people when you move to a new area. Join the art society. They're full of old women. Just perfect. I have lots of friends, and they're all artists.

ROSS-NAZZAL: I enjoyed talking with you. If you have any questions just let me know. Tell John I said hello. Nice to finally meet you.

HIRASAKI: Yes. It was nice. Thanks for letting me chatter on. Old people love to do that.

ROSS-NAZZAL: I enjoyed it. All right, I'll let you go. Thank you.

HIRASAKI: Bye.

ROSS-NAZZAL: All right, bye-bye.

[End of interview]