PROFILES OF SWE PIONEERS

ORAL HISTORY PROJECT

Arminta Harness Interview

May 1, 2003

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Arminta Harness

After graduating with an aeronautical engineering degree from the University of Southern California in 1955, Lt. Col. Arminta Harness joined U.S. Air Force as its first woman engineer. She blazed a trail for women engineers in the armed forces during her 24-year career, rising to the rank of Lieutenant Colonel. In 1963 she was assigned to work on the Gemini manned space Program at Air Force Space Systems. Harness served as deputy chief of engineering and later as chief of program control for the Gemini Target Vehicle Program, during which she became the first woman to receive the specialty rank of staff development engineer and the first woman to receive both Senior and Master Missileman Badges. Her military awards include the National Defense Service Medal, Air Force Commendation Medal, Joint Services Commendation Medal, and Air Force Meritorious Service Medal. Harness was also recognized as a Fellow of the Institute for the Advancement of Engineering and received their 1971 Engineering Achievement Merit Award. She retired from the military and in 1974 joined Westinghouse Hanford Company, as technical assistant to the company president and manager of laboratory planning for their nuclear development lab. A Fellow life member of the Society of Women Engineers, Harness served as national president from 1976 to 1978, designed and sculpted its Resnik Challenger Medal, and received the Society's Distinguished Service Award in 2000. Harness passed away in 2010.

In her 2003 Profiles of SWE Pioneers Oral History Project interview, Harness discussed her early education and attending the University of Southern California; her career in the

Air Force as an aeronautical engineer; her experiences working on the Space Program; and her involvement in SWE.

- July 2016

INTERVIEW WITH ARMINTA HARNESS, MAY 1, 2003

LAUREN KATA: Hello. It is Thursday, May 1st, 2003. This is an interview for the Society of Women Engineers Oral History Project, with Retired Lieutenant Colonel Arminta Harness, past president of SWE from 1976 to 1978. Hi, Minta.

ARMINTA HARNESS: Hi. Nice to be with you.

LK: Thank you. Can you start by establishing your date and place of birth?

AH: March 2nd, 1928, in Oilton, Oklahoma. My father was in the oil business. And we moved a lot, so I really was never in one spot very long. But Oilton was kind of home for my parents.

LK: Is that where they were from?

AH: Mother graduated from high school there, and Daddy went to high school there a little. Their family bounced back and forth between Arkansas and Oklahoma.

LK: But they were both born in the United States?

AH: Yes. My father was the baby of five boys, no girls in the family. And Mother was the only girl growing up. And after she married she had two sisters, one a year older than I, and one two years younger. (Laughs) So a strange family.

LK: Wow. And so you were born in Oklahoma. Do you remember your early childhood there? I know you moved around.

AH: No. We always went back to Oklahoma. My mother's

parents were on a farm. And my father's parents ran a motel, basically, and a bar (Laughs) and grill about thirty miles from where my mother's family was in another little town in Oklahoma. We would go back there every Christmas, and usually once in the summer, so it was my permanent home, because we moved so much every -- you know. I went to nineteen schools altogether, including college, two colleges. I went to two high schools.

LK: What was that like, having to transfer schools?

AH: It wasn't bad when you were young, but it got a little hairy when you were older. And when you're an only child and then you're moving all the time, making new friends, you grow up to kind of just be a loner.

LK: Do you remember early experiences with technology or science when you were young?

AH: Not really, except my father being in the oil business, and we had our own rotary drilling equipment. And during World War II, I helped train -- help was very hard to find in the oil -- although the oil business was a priority business. So we had farm boys that we were training to be helpers, and I helped my father train some of them, (Laughs) how to dress a bit, and how to splice a line.

LK: And how did you know that? From your father?

AH: Just growing up, being with Dad. Mother always made it

a point -- on holidays, particularly, we would pack maybe a turkey and a big dinner and stuff and go over to where Dad was drilling, because you can't shut down a rig just because it's a holiday. And so, you know, we would go out. And then I watched a lot, the drilling, and became pretty good at it. (Laughs)

LK: So when you were in school, did you know that you wanted to become an engineer?

AH: I made that decision my sophomore year in high school.

LK: How did you come to make that decision?

AH: Well, I had a very, very good high school algebra teacher, who was a young woman, who really was interested in all of us, in terms of what we wanted to do and what we could do. And she helped me go through a whole list of things that would use my love for mathematics and physics and chemistry and the sciences and aviation. I was always interested in flying. I got my pilot's license before I was twenty-one. So it was just kind of a natural thing that aeronautical engineering sounded great. (Laughs)

LK: Did you know any engineers when you were young?

AH: Not graduate engineers, no. Only the men in my father's business, who were basically engineers, but different kinds of engineers than I wanted to be, and not necessarily engineers by education. They were by the work they did, by their experience.

LK: So you were a sophomore in high school. And was there ever any question about you going on to college?

AH: None whatsoever. It was an interesting time period. Pearl Harbor happened my freshmen year in high school, over the Christmas vacation my freshmen year.

LK: Wow. Were you here in California?

AH: No, no. We were in Illinois then, southern Illinois. And then the war was over about the same time that I graduated from high school. The war was over in Europe and not quite over in Japan yet when I graduated. And VJ-Day was that summer. So it was a different time period. The only -- there were two boys at our high school graduation. They'd all gone to the military. And these two boys were 4-Fs, you know, medical. So it was a different time period.

LK: Were you in the same high school all four years?

AH: No.

LK: Where did you graduate?

AH: I started high school in Mt. Vernon, Illinois, and I graduated from Owensboro, Kentucky. I was at Owensboro a year and a half, I guess, before graduation.

LK: Was Owensboro where you met your teacher who encouraged you to be an engineer?

AH: No, that was at Mt. Vernon.

LK: And so do you remember what any of your other high school teachers or guidance counselors thought about your career choice? Or did that come up at all?

AH: It really didn't. I think some of them thought I was nuts. (Laughs) Particularly, I had an old male chemistry teacher who was -- you know, he wasn't happy to have girls in his class, you know, let alone being curious. (Laughs) But that's -- you don't pay attention to that. (Laughs)

LK: Why didn't you pay attention to it?

AH: I didn't have to. I didn't need -- I knew what I wanted to do. I had people supporting me.

LK: So your parents supported you.

AH: Oh, yes. I think they were a little surprised that's what I wanted to do, but they supported it. (Laughs) And there was no doubt about my going to college. When the time came when I said that I wanted to go to the University of Southern California and we were in Illinois, that really kind of -- no, as a matter of fact, I think we were in Michigan then. But anyway...

LK: Okay. And then you were in Owensboro?

AH: Yep. I graduated from high school in Owensboro, Kentucky.

LK: And you already knew you were going to be at USC [University of Southern California]?

AH: Yes, but not directly. I went to Lindenwood College for Women for two years prior to -- in St. Charles Missouri. It's now Lindenwood University, and no longer girls' -- just for women. But at that time it probably was a pretty good thing for me. I don't think I would have been quite ready -- most for SC. And all other returning GIs going school on the GI bill and taking engineering, so many of them. Many of them had been pilots. They had been pilots over in Japan, over in Germany.

One young man that I dated quite a bit had been a prisoner of war in Germany. And one of our classmates was a survivor of the Bataan Death March. So it was a different period, a different period.

LK: It sounded intense.

AH: Yeah, kind of. It was four years of war, national war, on two fronts, Europe and Japan. All -- from my entire high school, you see, so that it painted everything a slightly different color. But we had fun too.

LK: So how old were you when you finished Lindenwood and then moved to California?

AH: Oh, dear – came to California to go to SC -- I must have been seventeen, and I was nineteen when I came out here. Mother had an aunt and uncle who lived in Los Angeles. And they kind of took me under their wing. I don't think Mother would have let me

come out here otherwise. But it worked out well.

LK: And so, do you remember when you started taking engineering courses, what that was like?

AH: (Laughs) Oh, yes. I was always the only woman. And I had one professor I'll never forget, who decided that he would run me out of class he was so unhappy having me in his class, by using profanity and telling dirty jokes. And finally, the men complained.

LK: Really?

AH: So you know, I never did (?) change. But most of the time they were very supportive, but there were some...

LK: And so you were the second woman to graduate in engineering from USC?

AH: Yes. Charlotte Christian -- who was a Wilkie, then she married one of the guys and became Christian, graduated a semester ahead of me at USC, yeah.

LK: Wow. Were you friends with her while you were in--

AH: Oh, yes, very much so. It was just the two of us. Particularly when they -- excuse me, I've got a little bit of an allergy. We were at SC at the time at the College of Aeronautics at Santa Maria. And so that's where we were, all the engineers were up there. I was at the main campus for one semester, and then went up to there, and then came back to the main campus for

one year, the final year.

But it was a very small campus. We had, in addition to the engineers and -- aeronautical engineers only, and there were probably thirty of us, maybe, two women and twenty-eight men. And then there were others who were taking a.v. [aviation?] mechanics, drafting, you know, other peripheral activities in aeronautics, aeronautical field.

LK: There were other women, or just other men?

AH: No, other men. All men, all men. There were only two of us, only two women.

LK: Wow.

AH: It was an interesting experience. (Laughs)

LK: Were there any women instructors?

AH: No. And not all the male instructors were that supportive, but a few were, and God bless them. But I did get some different ones. (Laughs)

LK: And during this time you were still interested in aviation. Can you talk about that a little bit?

AH: Well, of course, that's required with becoming an aeronautical engineer, to design planes and stuff.

The campus in Santa Maria was an old airport. The women's dorm -- out my window was the runways, and small planes. It was Alan Hancock lived in Santa Maria, and was an aviation pioneer.

And he donated a great deal to SC, this Hancock Building done on the campus and buildings there. But the Hancocks lived up there. And he had started that airport back in the '20s, and then he gave it to SC. And SC didn't really know what to do with it. And then they decided, well, let's have AV Mechanics and the mechanics--

(INTERRUPTION IN RECORDING)

LK: Okay, we're back. You were talking about Alan Hancock.

AH: Yes. He was a pioneer in aviation, and he had the field there, the flying field. During World War II it became a military base where men learned to fly. And then after the war, he gave it to SC to use as an -- you know -- so for just a few years. They didn't like having -- they found they didn't like having so many -- a group of their people so far away from the main campus, so that eventually they closed it. But it was fun, different experience, because there were so few of us, and only two women. And it was different and fun, and I'm glad I did it.

LK: And at the time, aeronautics was airplanes and aviation.

AH: Uh-huh. It's all just a broad term for anything that refers to flying.

LK: Right, right. What led you to earn your pilot's license?

AH: Well, as I said, my decision to become an aeronautical engineer was made my sophomore year in high school. So I read,

you know, everything about aviation and flying. And then when I had the opportunity -- my dad was drilling oil wells in Michigan the summer between my -- I guess it was my Lindenwood and my USC days. And there was a little airport there. (Laughs) And next thing I know, I'm taking lessons and flying. I got my license. And I had just gotten my license that summer when I came back now to SC.

LK: Wow. Did you know anyone else with a pilot's license besides the returning GIs?

AH: Well, where I took my lessons, the -- jeez, what was her title? She was kind of like, I don't know, the secretary, but more than that, in the office where everybody would take these flying lessons. So she decided that she wanted to learn to fly, too, because everybody else was. But she was the only other one at that time -- the only other woman with me, because they were all men.

LK: What did it feel like to be in the air flying?

AH: Ah, great. I have really pleasant memories of that time. One time I was out flying and just getting additional hours, and I saw my father on the ground in his jeep going from one oil well to another oil well, and I lowered and buzzed him (Laughs), and it was so fun. (Laughs) He finally realized who it was. (Laughs)

LK: Oh, how funny.

AH: Oh, it was fun, yeah. You know, it was fun. I really enjoyed it. And the man that I dated mostly during that time period had been a prisoner of war in Germany, and was a bomber pilot. So I flew with him quite a bit. We'd take up some of the twin engine -- you know, the bigger planes and things. So that was always fun, because I'm not piloting, I could see -- you know, I could watch and see things and stuff. But just -- I love to fly. I still do. I haven't -- I let my license lapse a long time ago.

LK: Yeah.

AH: It's an expensive hobby. (Laughs)

LK: So can you talk about your time in the Air Force and how you came to be part of the military, and the background on that?

AH: Well, at the time that I graduated from SC, all of the men who had returned from World War II had gone back to college under the GI Bill, and they were all getting out, all graduating basically at the same time. And you know, time and time again I was told, "As long as a returning GI needs a job, I'm not going to hire a woman."

LK: You heard that when you were looking for a job?

AH: Uh-huh. And so I decided, well, you know, I've heard all their stories and all their -- everything, and their military

background, why not join the Air Force and get some experience, never dreaming I'd make a career of it. I mean, that was not my intention at first, just basically a chance to get a job somewhere.

LK: Why did you choose the Air Force?

AH: Aeronautical engineer.

(Laughter)

AH: Kind of there was no question. (Laughs) No question at all. Well, it could have been, I guess, Navy, Navy pilot, but I'm not -- I don't have good sea wings. (Laughs) I get seasick.

LK: So do you remember how -- I mean, did you go to like a recruitment office, or did you know someone that came to USC that came and talked about the Air Force or--

AH: No. Jeez. No, I was back here in LA [Los Angeles]. And I guess I went to the recruiting office. I don't remember. I don't remember. But then I was to meet a board that turned out it was the wrong board; I shouldn't have been there. But it was okay; they gave me my interview, as it was.

LK: For the Air Force?

AH: Well, yeah. It was for the Air Force, but not as an engineer. (Laughs) But they said, "Well, you're here, you might as well do it." But it was kind of fun, a little messed up, maybe. You know, I wondered what was going on. And then (Laughs)

oh, jeez, in the recruiting office I met the board of -- you know. And after I was already in the Air Force and I was sent out on recruiting duty, I found out that the board that I met with, you know, I shouldn't have met -- they shouldn't have handled my case at all. (Laughs) It was very interesting.

LK: But it somehow worked out.

AH: Somehow it worked out. But when I graduated from OCS, six months of OCS, Office Candidate School in Texas, and expected to be sent out as an engineer. And surprise, surprise, I got sent out on recruiting duty in Minneapolis, Minnesota. And I'd never been north nowhere in my life. And it was cold up there!

LK: Quite a climate shock.

AH: And to go up to Bemidji, which is way up north in Minnesota in the winter was an experience. But it was, in the long run, a good experience. It gave me -- I don't know what the word is, the word I want. It gave me experience in dealing with people that I had not really had very much in engineering. So it was interesting.

LK: Was it usual for women to be assigned as recruiting officers?

AH: Yeah, because the Air Force was recruiting women and wanted enlisted women.

LK: Really?

AH: Yes. But you know, I wasn't real happy with it, because as an engineer I wanted to be working as an engineer. I did not want to be on recruiting duty. But I had two years of it. I had a year out in Minnesota, and I traveled all over the state. And then I was sent to Wright-Pat.

LK: Wright-Patterson Air Force Base in Dayton?

AH: Yes. I was sent there as an aeronautical engineer on the paperwork. But I encountered a male personnel officer who -- you know, the one who processed me, and he firmly believed that all women should be in admin [administrative] type work, so he made me the administrative officer of the Aerial Reconnaissance Laboratory, which was kind of interesting, because I read a lot. And among other things, I learned how to transfer my own self into an engineering job, which I did. (Laughs)

We got a little second lieutenant in who was a French major, and nobody what to do with him, so I trained him as a personnel officer to take care of my job, and then I transferred myself into an aeronautical engineering slot. And then I stayed -- I was, from that point on in the Air Force, I was always an engineer.

LK: Wow.

AH: But it was (Laughs) -- you have to sometimes be your own best recruiter.

(Laughter)

AH: So I was at Wright-Pat for five and a half years, mainly in the Aerial Reconnaissance Laboratory. At one point I was on flight status testing some of my own equipment. We'd go up on -- we had two test beds. One was -- oh, dear, what -- it was the largest airplane in the world at the time. I can't -- a senior moment. I can't even think of the name of the plane. But anyway, it was a test bed. And we had our own kitchen -- oh, it was a B-29, yeah, I guess. It was from World War II, a B-29. And had a kitchen in it.

And it was fun. You had a pressurized cabin, of course, where the pilot and everybody was. And in the back you had a pressurized cabin where they had a kitchen, because they could stay up for days. But in between was the bomb bay, which was unpressurized. But through the bomb bay there was a tunnel, and it had closed -- locked doors on it either side. And you would open that up, and there would be a -- there was a sled. And you would lay down on your back, and you would pull yourself through the tunnel to go up to the other side from the front to the back.

(Laughs)

LK: Oh, my gosh.

AH: It was weird. It was fun. I loved those days at Wright-Pat, because that was -- well, we did all sorts of things. I had my own parachute because they got sick of my taking up, you

know, all the straps and putting it back in. Normally you'd just get a chute out of the general area where they're all kept. But the men all complained because if they got the one that I had all the straps had been tightened up and shortened up, and they had to let them out. So they gave me my own parachute. (Laughs)

And then the same thing when I needed an oxygen mask, they were all too broad in the nose. So you know, I'd get this little shot of air in each eye. So they had to make me a special mask. I had a facial -- plaster of Paris facial for it, and they made me my own mask.

LK: Wow. So you were the only woman.

AH: Yes, which when you went out on your survival training, that made life interesting, because you were -- we were on a lake. And one of the things you had to do was to turn over a twenty-man life raft and re-position it, you know, by yourself (Laughs) out in the middle of the lake while you were swimming, which was fun -- (Laughs) while you're treading water.

LK: Wow. Did you train for that, or--

AH: Well, you know, I watched all the guys do it first, so I knew, you know, I picked -- you saw some of the tricks that some of them used. But yeah, but...

LK: Were there ever any issues with you needing your own special equipment or--

AH: Well, yeah, the mask was one, they had to make because the bridge of my nose was too thin, and none of the regular masks would fit.

LK: How did your cohorts respond, though? Were they okay with it, or--

AH: Yeah, they were. I'm sure there were some of them who didn't like it too well. But I got along well with the guys. I had been in college with just the men in engineering, so it wasn't a new thing for me. And you learn a few tricks to kind of smooth over the ones that you know are not necessarily thrilled with you.

LK: Like what kind of tricks?

AH: Oh, I don't know. (Laughs) I really don't remember, but it just -- you know, asking -- making sure that -- if you got somebody who is not very happy to have a woman on the team, making sure that you kind of build him up a little, you know. And you ask for his help, and you do -- (Laughs) you play the game.

LK: Did anyone ever counsel you about that, or is that something you kind of figured out yourself?

AH: I figured it out myself. It was, I think, just a survival mode more than anything else. But with college, and all men, you know, and it made it a lot easier out in the world.

LK: Did you have any female role models during this time, or at any time in your life?

AH: Amelia Earhart, always.

LK: How long was she your role model?

AH: Well, starting in high school. You know, I have one of her autographed books in there that I've had since high school. And then, of course, I've had several more since then, but that one--.

LK: So you met her?

AH: No, I did not. But I would love to have. She was lost, you know--

LK: That's right.

AH: -- during my life. But she was the closest thing to a role model I had, yeah. And she encouraged women to take engineering, aeronautical engineering. That's probably where I got the idea.

LK: Yeah. But did you have anyone, male or female, that acted as like a mentor for you during your early career?

AH: Not really. Just the opposite, several times. It's been -- I did it alone a lot, you know, all through. But being an only child helped, because I was raised that way, you know. We moved all the time, and so that I'm very comfortable with myself, and that's important.

LK: So can we talk about how you became involved in the US Space Program, and how you felt about that at that time?

AH: Well, when I was -- this was my first tour out here in LA at -- gosh, down the road at Los Angeles Air Force Base, I was assigned to the office that was working on the Gemini Program.

LK: The Gemini Program was through the Air Force at the time?

AH: Well--

LK: It's a little complicated? (Laughs)

AH: Yes. All space activity was done by the Air Force. Then NASA was formed, but NASA was a new organization. So the Air Force and NASA were working together, you know, very, very -- it wasn't really until the Apollo Program that NASA was totally in charge of that program. Gemini was -- and we were on Air Force rockets, so that, you know, to launch the Gemini Space Capsule. So it was just a hand-in-glove Gemini and Air Force.

LK: Do you remember how you felt about being part of that Gemini Program?

AH: Oh, thrilled.

LK: Did you have a sense of what it was a window into?

AH: Well, I don't know -- well, you know, this was the first manned vehicle in space. Now, I did not work on the portion of the manned -- the capsule -- the manned, I worked on the vehicle that they docked with in space, and then they used -- that was the Agena Target Vehicle. And then because they had very little

propulsion capability in their spacecraft, when they docked with the Gemini, then they could use that propulsion to tool around in space.

LK: Wow.

AH: And that, you know -- so that -- I spent a lot of time in Texas, in Houston Space -- working with -- you know, back and forth, doing a lot of travel at the Cape.

LK: Was this at the Space Center?

AH: Yeah. It was brand new. Brand new. When I first went there, they were in downtown Houston.

LK: Wow. So it wasn't even -- was it even the Johnson Space Center yet, or--

AH: No, no. And then I'd go to the Cape.

LK: This was in the late '50s?

AH: Early '60s, yeah. I think. (Laughs)

LK: That's okay.

AH: I told you I'm dazed sometimes.

LK: We can look them up.

AH: Yeah, yeah. But I don't know if I've shown you my actual photograph taken by the astronauts of the Target Vehicle, which I worked on docking. I mean, it's sitting out there in space. Yeah, it's a great picture.

LK: Wow. So did you have much interaction with the

astronauts while you were working on Gemini?

AH: No, not really. They were always there. In Houston you would have a review -- periodically, reviews in big offices -- in big, big rooms, you know, with -- and everybody has their own desk and stuff. And all the astronauts were there. I knew Buzz Aldrin very, very well, because Buzz was an Air Force officer and had the desk next to mine out here at Los Angeles Air Force Base. And he left us to go to Houston to become an astronaut.

LK: Did you ever think you wanted to be an astronaut?

AH: I wouldn't have minded, but unfortunately, women weren't allowed to do that then. It was too early, and nobody was -- nobody was--

LK: Were there any women who tried to pursue that?

AH: Yes, yes. There were a number of women who basically, on their own, set up a program in Texas to prepare them for it. None of them ever got to go. It's a shame. But I'm sorry, I've forgotten the names of the women involved.

LK: That's okay.

AH: But it was, oh, like many things, not open to women at first.

LK: Yeah.

AH: But when women persist and persevere, (Laughs) they get it.

LK: And you contributed to the program as an engineer.

AH: Yes, oh, yes. I spent a lot of time back and forth between Houston and LA, and the Cape, when we finally got to it. As a matter of fact--

LK: The Cape is in Florida?

AH: Yeah, Cape Canaveral. I will never forget our first launch. I was on top of a ten-story building at the Cape, overlooking -- if you look down at the beach where -- you know, our first launch. And you waited, and you waited and you waited, and all you could hear were the controllers saying, "No joy, no joy, no joy." And the thing had blown up at the edge of space. It took off, beautiful, beautiful takeoff. But whatever happened -- we never did really find out exactly what happened, but it blew up at the edge of space before it got a chance to get into orbit.

LK: This was a manned flight?

AH: Oh, no, no, no, no. Gemini was unmanned.

LK: That's right.

AH: Yeah, originally, I mean, at the beginning of it.

LK: The beginning, the first one, okay.

AH: Yeah, yeah.

LK: I wasn't sure if you meant the first manned--

AH: No, no.

LK: How did you feel when that happened?

AH: Horrible! I mean, you've been working on it for three or four years, and our first launch, and we lost it. But you go back to the drawing board and figure out what happened and see that it doesn't happen again. And it didn't.

LK: And what is that process like?

AH: Oh, boy.

LK: I mean, the dynamic of the morale, and then having to--

AH: Well, everybody gets together, the mass of people who are in charge and the Air Force people who are doing the work, and we have various working groups. And your first business is to trace down the why, how, what happened. And then when you've done that, then how do you correct it and make sure that it doesn't happen again. It was an interesting process, but one you wished you hadn't had to do.

It's just like I was at the Cape for the Apollo Program. And the first capsule, you know, almost -- well, it did sink. And they just barely got the astronauts out of that capsule in time when it came back down. So you never can be sure what's going to happen. So that's one of the things that keeps it interesting.

LK: Did you meet any other women who were contributing, either as scientists or engineers to the space program during this time?

AH: No, which made it kind of difficult.

LK: Yeah. Did you know that there were other women working during this time, but you just didn't connect with them, or--

AH: I don't think there were any. Contractors, maybe, but I wasn't in contact with contractors. I don't know, you were so busy that you didn't really think about it much.

LK: Sure, yeah.

AH: But looking back, it was fun. You know, our first one was -- you know, that first launch, to hear all around the world everybody saying, "No joy, no joy, no joy." The thing had blown up at the edge of space before it got into an orbit.

LK: "No joy" is the--

AH: They can't acquire it. They can't find it. It's not in space. You know, it's not where it's supposed to be.

LK: Wow.

AH: So you all go back to the drawing board and do some more work, and you find out what happened. And that's an interesting learning curve.

LK: And then you moved on from the Gemini Program.

AH: Yeah. I was transferred -- jeez -- for a while I was into a classified program that I can't talk about. But I wasn't in it very long. And then I was transferred to Washington DC in the National Reconnaissance Laboratory, where all of the pictures that are taken from the space vehicles, the unmanned ones that are

taking pictures of various things around the world. All those pictures go into the -- it's the National Photographic Laboratory -- then they did.

And some of the ways of capturing some of that film was fantastic. You had an object circling the earth that had camera equipment on board. This was before electronics. We were really still in the photographic era, you know. And you've got film up there, but no humans anywhere around. And they worked out a way of the film would be ejected automatically from the camera after the... And then a parachute would come out, and then an airplane would come in with the back of it open, the cabin -- back -- cargo plane. And then they had a triangular wire thing out there, and they would snag that parachute in air as it was coming down, and pull it into the plane. (Laughs)

I mean, it sounds so crude now, but the first photographs in space, that's the way they were processed. You had this aircraft out there, and as the parachute came down with the capsule that had the photographs in it, and they snagged it and took it into the plane.

LK: Wow.

AH: (Laughs) It sounds so crude today. (Laughs) It was fun.

LK: And it was the edge of technology at the time.

AH: Yeah, yeah. And then of course we got into electronics, and that was a whole different world. You no longer had to capture film, and everything would come back. So it was kind of interesting to do that.

LK: Let's shift gears for a minute -- we have about ten more minutes on the tape -- and talk about how you first heard about the Society of Women Engineers.

AH: Good, because that's what I want to talk about. Bea [Beatrice] Hicks, who was the first president of SWE, was appointed by the president.

LK: The President of the United States?

AH: Yes. To the Advisory Committee on Women in the Air Force.

LK: Was this President Johnson or President Kennedy?

AH: No, no, no, no. Kennedy, it must have been Kennedy. I marched in Kennedy's inaugural parade.

LK: As a representative of the Air Force, you did?

AH: Yeah. I led a squadron of troops, women, down Pennsylvania Avenue.

LK: What was that like?

AH: (Gasps) Froze my tail off. We had a major, major snowstorm the night before.

LK: That's right. Okay.

AH: And they had had to send in snowplows on Pennsylvania Avenue. And all the side streets were full -- they were full of snow. They just -- all these poor neighborhoods, they were blocked in because they had to get it open. And they used flamethrowers. They had marines out there with flamethrowers drying Pennsylvania Avenue. It was something else.

And you gathered -- you know, all the side streets behind the capital, which wasn't a very good neighborhood then, either. And then you feed into -- on Pennsylvania Avenue you come in and fall into place.

But I had a squadron of enlisted women that I was leading, was going to lead down Pennsylvania Avenue, that I was, you know, responsible for. And we were freezing to death out there. We had, you know, skirts on, for heaven sakes! Although we did have on galoshes to keep our feet warmer. (Laughs) But I -- sometimes buses would come by and get stalled and sit for a while. And boy, I'd commandeer it and get my troops on board the buses and let them stand there and get warmed a little bit until the buses had to move out and came back out. And we did that quite a few times. It was an experience. The officers never did get on board the buses. We were really frozen stiff.

LK: Were these women that you actually worked with, or these were just women in the Air Force and--

AH: No. At Andrews Air Force Base, where I was stationed at the time, I was at headquarters as an engineer. But I had marched with them. They didn't have very many women officers on the base side of the--

LK: And at this time you were a lieutenant?

AH: No. I was at least a captain by then. I think I was a captain, yeah. (Laughs) And so they needed leaders when they marched. I'd go out and practice marching with them. And I'd been doing that. So when the time came for them to -- when they were picked to do the inaugural, then I was one of the leaders. And I marched down Pennsylvania Avenue.

And I was the only one that did not get to see President Kennedy because I was looking straight ahead while everybody else did an eye to the left. But they had to have one person to pay -- (Laughs) so we wouldn't wobble all over the place. So I had to look straight and keep us straight. So I never did see the president. (Laughs)

LK: Yeah. You make sacrifices when you're the first, right?

AH: Yeah.

(Laughter)

AH: Ah, but those were fun days, though, really. I smoked in those days, and I never will forget getting on that bus at the end of that. And my hands -- we had cloth gloves, for heaven

sakes. And my hands were just absolutely frozen. And the first thing I did was to light a cigarette. And pretty soon they smelled it. And it was smoking -- you know, not quite burning, but almost burning between -- on those gloves. But you know, it was a lot of fun.

LK: Yeah. Well, that was kind of a side story. But we came on to that after you started talking about Beatrice Hicks being part of this presidential committee.

AH: Yes, in DACOWITS, that's Defense Advisory Committee on Women in the Service.

LK: Okay. That's D-A-C-O-W-I-T-S.

AH: I guess.

LK: Do you know why she was chosen to be on that committee -- or selected?

AH: Well, you know, she was a very prominent woman. She was our first president, but in addition to that, she had a very prominent life. And if you look into Bea's life, it's very fascinating, it really is. I highly recommend that you try to do it sometime. But she had been appointed by the president to this new committee.

LK: Had you heard of her before that?

AH: No. But the first thing that she did was -- just because she was an engineer -- say, "Do we have any women

engineers and scientists in the military?" And, yes, Air Force, primarily. There were a couple of scientists in the Army, but all the engineers belonged to the Air Force. And so when the first ICWES was started, the first International Conference of Women Engineers and Scientists was held in New York City -- Bea Hicks was president and in charge of it -- she made sure that military women engineers were invited.

LK: That was in 1964.

AH: Yeah.

LK: And that was the first you had heard of SWE.

AH: And I left there with applications in hand. And two of my friends who were scientists went with me that were from here.

LK: What was that conference like, the international conference?

AH: Oh, it was great. It was thrilling. I hadn't seen that -- I had been the only woman engineer (Laughs) anywhere I've been. And all of a sudden there were hundreds of them! It was marvelous! (Laughs) Not all engineers, some scientists, but you know... It was really -- and Bea was such a genius. She was a marvelous, marvelous woman. A good, good leader, and just a great woman. And so as I said, I left there with applications in hand.

At that time we had the Engineering Building in New York, of all the engineers. And we had a little one-woman office. And it

was a small room about the size of this room, and then a storage room that was about half again this size. But that was our headquarters. And so anyway, that's -- they made sure that we had applications when we left.

LK: And when you went home, you filled them out and became a member.

AH: We went home. We filled them out. Then I went down to the Biltmore Hotel. (Laughs) I will never forget my first SWE meeting in SWE LA. I mean, I was already a member when I went to my first meeting, you know, besides what I did with the conference.

The Biltmore had been a great hotel at one time, but it was at its low point then. Pershing Square, across the street, was where all the bums lived. The Biltmore had gorgeous, gorgeous chandeliers that hadn't been cleaned in years. The hallways were lighted with forty-watt bulbs. It was probably a good thing because the carpets were so dirty, and so, you know...

LK: And this was the first SWE LA meeting that you went to.

AH: Yes. The Engineers Club was in the Biltmore Hotel. And here I am in uniform. You had to park right next to the hotel, and then go in and, you know, all these bums across the street. And it was the worst part of town. And the hotel was (gestures thumbs down). And you go in. But the Engineer's Club had a

marvelous, marvelous guy who ran it, who was the manager and the bartender. (Laughs) And he became my best friend.

LK: What was his name?

AH: Al. I can't remember his last name, but his first name was Al. And we had dinners brought in from the Biltmore, and he took care of that. And he took care of us. He liked his women engineers. He was nice.

LK: Well, let's take a break. Let's stop.

AH: Great.

(INTERRUPTION IN RECORDING)

LK: Okay. This is tape two for our interview with Arminta Harness, April -- I mean, May 1st 2003.

AH: Jeez, already. (Laughs)

LK: I know. I can't believe it. Minta, we ended tape one talking about how you first heard of SWE, and how you attended ICWES, and what that experience was like.

AH: ICWES. Well, it was fascinating. I had never heard of the society. I didn't know anything. It was a revelation that was wonderful. You know, I'd been alone, the engineer, woman engineer for so many years, that it was wonderful to meet so many other people who were in the business who had been through what I had been through. It was -- you know, I came back with applications in hand. And I've been a SWE member ever since. I

became a life member, I don't know when, sometime. And well, just a life changing experience. It really was.

LK: So after the New York meeting and you came back here to LA, did you start to get active within the LA Section?

AH: Yes.

LK: And how was it different -- how was the section level of SWE membership different from the National?

AH: Well, LA was at a low period then.

LK: This was in the '60s?

AH: Uh-huh. And that first meeting, I'll never forget. One, the Engineer's Club was in the Biltmore Hotel, which used to be a very nice hotel, but had gone very much to seed. And I went down there in uniform, after work and I parked. And across the street was Pershing Square, which, at that time, was where every bum in town was hanging out. It was a weird experience. And then when I was at the hotel, which obviously had been a very fancy hotel in its day, but the chandeliers hadn't been washed and cleaned in ages. The lights in the hallways were, I think, forty-watts. It was just, you know...

But then I went into the Engineer's Club, and there was Al, who was the manager/bartender. And he and I became fast friends. (Laughter)

AH: And I met Loring Nicholson for the first time, and

others. But Loring was, you know, the shaker and mover in those days. And it was -- you know, you could touch the velvet drapes and the dust would go "puhh!" (phonetic)

LK: Oh, yikes.

AH: But the place -- the location obviously had been a grand place at one time that had really gone down. But the people -- the section people were -- it just made all the difference in the world. You know, I newly became a member of SWE.

LK: Is it important to be involved in engineering professional societies outside of your work?

AH: I think so. I think so. I was not really involved very much with the organizations pertained to my own specific discipline. I think I missed something probably by not, but certainly SWE became very important. For the first time, another woman engineer, not just one, but several! And stories that you could exchange that were similar -- different, but similar, and it was, well, you know, a whole new -- another whole thing.

LK: How did the Air Force feel about SWE, or did it ever come up?

AH: I don't think it really ever came up. I think -- I mean, it was accepted that I, as a woman engineer, had found an organization of other women engineers. And that was accepted. That was accepted. It was an interesting time in the Air Force, it

really was. You know, it was really -- we were entering the space age, and it just was an exciting period. It was an exciting period to be an engineer. And to be accepted as a woman engineer was something that was relatively new. I had, you know, had a few bumps in the road before then. But it was all of a sudden a whole new world. It was great. And I attribute much of that to SWE, because talking to other women engineers who went through the same sort of things that I did, they were not in the Air Force, but they had the same, you know, problems, the same aspirations, it really -- I don't know, it was a kick in the butt, I guess, because it woke me up.

LK: Sure, yeah.

AH: And I had been in New York, and I had been to the -- my introduction to SWE, but it was the local area, the local people that -- and particular one person, Loring Nicholson, who--

LK: She was an aerospace engineer?

AH: No, I think she was a mechanical [engineer]. But Loring had been a member of the LA Section from the very beginning. Yeah, [she] became the real big, you know, focal point. She was the one who had kept the section going when [it] was (sighs), you know. And we became very, very good friends -- very good friends, although she lived clear across the city, on the other side of the -- practically in another county.

LK: Were you still in California when you decided you wanted to get more involved in SWE at the national level, or by then had you already relocated?

AH: Well, yeah, I went from here, let's see, back into Washington.

LK: Still working at the Air Force?

AH: Oh, yeah.

LK: At the National Reconnaissance Laboratory?

AH: Uh-huh. And I was active in SWE there, but I really didn't -- it was just being a member. The Baltimore/Washington Section, you know, I spent long -- two cities that far apart to have a section (Laughs)... And Naomi McAfee and I had -- and I don't really remember how it started, but Naomi somehow or another took a dislike to me. And it was an interesting time period when we were like this at meetings. And I mean, two fists together, because it really was that way. And I don't really understand why, never have. I don't know if it was jealousy, something about the Air Force that she didn't like or what. But anyway (Laughs), it was an interesting period.

I lived in Alexandria, Virginia and she lived in Maryland, so you know, it was only at meetings that we ever met. But it was an interesting -- I've never had an adversary before like that one.

LK: Do you think that that pushed you to work harder within

SWE?

AH: I think so. I think so.

LK: Okay. So when did you start really getting active in the National?

AH: Dear me.

LK: What I meant to ask is: What was that experience like?

AH: Well, I don't -- it was kind of a gradual thing, just like it kind of crept up on me and happened. I became more and more involved at conventions. And that's the time period that we started the Over-the-Hill Suite.

LK: You want to talk about that a little bit?

AH: Yeah.

LK: Starting the Over-the-Hill Suite for SWE?

AH: Yeah.

LK: What is the Over-the Hill Suite?

AH: Well, it started -- "Pritch" [Margaret Pritchard] and I roomed together. And we had, you know, a one bedroom and then a parlor. And we opened up the parlor kind of open for people to come, and lots of booze, which people paid for.

LK: Right.

AH: But I don't know really -- I guess we need to talk to Pritch a little bit about that, too, because it just evolved.

LK: Well, let me ask you this: What's the dynamic between

young people and old people when you come to the Over-the-Hill Suite?

AH: Well, that's what was so great. We loved to have the students come, because they, you know, juiced things up a little bit, and we got a different viewpoint. In the very beginning there was a great deal of awe on the part of the students. They were a little bit intimidated by all of the old -- because we had all the past presidents. All the old -- you know, everybody -- the people who were in the Over-the-Hill Suite were people who had been dynamic in the society, and it was intimidating to the younger ones.

LK: That's still true today.

(Laughter)

AH: It probably is. It probably is. But I don't know, it just evolved. We didn't start out to build something; it just evolved, because we loved to have the students there and the younger members of our society. That's what the society is all about, the future.

LK: What is the purpose of SWE, Minta?

AH: It's hard to say. One, the advancement of engineering as a profession for women. That's number one. In the beginning it was like we were trying to prove and to show that women could be professional engineers in an era when women were not given the

highest of positions, you know. And I don't know, its current status, I really don't know. It's just become habit, I think. But it's a place for students to talk and have an interchange with working women engineers. That's how it basically started out to be. And I think that's still going on. But that's the important impetus behind the society. And, you know, fun and drinks.

(Laughter)

AH: I can tell you stories, you know, being on the thirteenth floor, out on the balcony, having contests to see how long it took a drop of scotch to completely evaporate before it --

(Laughs)

LK: So you'd do some scientific experiments--

AH: Yeah, and really -- oh, yeah, yeah.

(Laughter)

AH: Sure. (Laughs) Fun things.

LK: That's funny.

AH: Yeah, it was. It was funny. I think it took three floors before a drop of scotch would completely evaporate.

LK: Oh, jeez.

(Laughter)

AH: It was real fun.

LK: Now, was that a technical presentation or--

(Laughter)

LK: No, I'm just kidding.

AH: Just an Over-the-Hill fun thing. But it was a period in which it was a little uptight for women. And this was an opportunity for women to relax and have fun and to enjoy. And that's what it started out to be, and that's what it's, you know, kind of continued to be. It's very different today than it was in the beginning, but it's still good.

LK: Well, let's talk about when you were on the Executive Committee, and the years leading up to when you actually were president of SWE, were, in terms of the women's movement, very active. And what was that like -- not only being part of SWE, but being a woman engineer and in the military during the height of the women's movement?

AH: Well, you know, we kind of bent over backwards not to be super active in the women's movement.

LK: SWE did?

AH: Yes. We wanted the advancements, but there were things going on in terms of how they were being pursued that we wanted no part of. It was a very interesting time period. I remember sitting at a national conference.

LK: A SWE national conference?

AH: No, it was a women's --

LK: The National Women's Conference?

AH: Yes. And there were a group of women down in front of us. And they had one woman sitting in the front right seat who had two flags, a red flag and a green flag. And when the votes came up she would use her red flag to say, "vote no," or her green flag to vote "yes." And this whole block of women followed. It was astounding. SWE was not, as an organization, not a participant in that women's movement.

LK: The mass movement?

AH: It was because we had people who were opposed to it, and we had people who were all for it. It was an interesting, interesting time period. I was national president at the time, and as such, invited by then President Carter as a delegate to this National Women's Conference. And it was very interesting, because SWE as a society did not have a national position on the issues before this conference.

LK: What about the Equal Rights Amendment?

AH: Well, I think all of us were for that.

LK: And so there's the principle, and the actual amendment, and then there's the radical activity that was going on?

AH: Yeah. And a lot of other issues, you know, workplace issues, scholarship issues, that -- and many of them at the conference, many of the issues were of no relationship to SWE. And as such, I did not vote on any of them, unless it was a

specific issue that SWE had discussed and had taken a position on. As an official delegate, that's the only ones I voted for. A lot of them were pretty radical.

LK: When you were involved at the national level, why were some women's issues discussed within SWE, and some, you know, SWE decided not to take a position on?

AH: Well, I think you have to look at our -- the basic principles upon which a society is built, and the issues that are pertinent to our organization and to our people, we took a position on. But many issues were not, had no -- they might be, you know, pertinent to individual people in SWE. But as a society, they were not national -- they were not issues that the society took a position on. And those we did not, I did not vote upon.

LK: Before the Women's Conference which was in 1977 when you were president, some years before that, the Counsel of Section Representatives [CSR] voted to officially endorse the Equal Rights Amendment. Do you remember that?

AH: Oh, yes.

LK: Can you talk about that a little bit?

AH: Well, surprisingly, there were a number of people who opposed it. It was not as you would expect -- as I had expected, a cut and dried issue. There were many people in SWE who were

super conservatives who viewed the women's movement as a little radical. And there were some people involved in the women's movement who were a little radical. But SWE was always a very conservative organization.

LK: At the national level?

AH: Well, it was a time period in which there was a great deal of discussion about whether or not this was an issue that SWE should follow or should do (?) to care about. And many of the issues before the general women whoever were involved in this were not issues that SWE wanted to have anything to do with.

LK: Yeah. Were you there when the CSR voted ultimately to endorse the ERA officially?

AH: Yes, yes.

LK: Why did that eventually happen, if SWE was so conservative? What were the discussions that eventually led to SWE endorsing ratification? Do you remember?

AH: Yes. There was a lot of discussion. And I think those of us who are in support of all the ERA issues had to convince others that they were issues that SWE should take a position on. There were many people who felt that they might support or they might object to, but that these were not issues that SWE should be involved in. They were not issues that our charter or--

LK: Sure.

AH: -- our -- didn't address.

LK: Why did you feel that SWE should?

AH: Because I think we're leaders of women and the women's movement in many ways, and that we frequently are too conservative. It's kind of difficult to really look back and figure out why did I feel that way.

LK: That's okay, yeah. Well, let me ask a different question: Why is something like an amendment or a law needed for women to be treated equally? Why can't you just try to change people's attitudes about it?

AH: Well, I think we had tried for a long time and had gotten nowhere. And there was a feeling that if you could make it the law that people would who opposed it would have to accept us. It was a strange period. There were -- oh, it's hard to look back and actually understand why we felt the way we did, because we take so much for granted today. But then there were real serious objections to women advancing, particularly in the workplace. And well, it was like the time had come.

LK: How was it -- I mean, SWE -- you know, when ERA finally became an issue just for the country in general, SWE had been around for twenty-five years already, and then as national president, what was it like to be leading SWE that had been around when all these new feminist organizations were being established?

AH: Well, it was a very -- it was a ticklish time because SWE has always been a very conservative organization. And I agree with that. You know, some of the radical feminist things that were going on, I didn't agree with. But it just -- I don't know, it just seemed the time was now. It had finally come, and it was time to either step up or shut up.

LK: Were you ever involved in any other women's organizations?

AH: Not really. We have an organization of Air Force women officers that I've been involved in for a few years. But we've never really taken on issues of that nature. It's mainly just -- it's mainly a supportive, you know. We've got the Women's Memorial in Washington and that sort of thing.

LK: Why is recognition of women important?

AH: I think because for so many years there wasn't any.

LK: It seems obvious, huh?

(Laughter)

AH: I think you have to have been through it a little bit to recognize that life wasn't always easy. And you had to fight for what just should have been a given. You had to change attitudes; you had to change male attitudes and female attitudes. We had a lot of people, a lot of women who were opposed to the women's movement.

LK: Or opposed to professional working women in general.

AH: Yeah, yeah.

LK: Did you ever meet anyone who was opposed to you being a professional woman in your career?

AH: Yeah, yeah. I think my last tour in Washington I was with the Defense Intelligence Agency. I can't talk about it too much. But we were housed and were with a national intelligence organization. And it was a man's organization, had always been. And it was a hard fight to get women recognized in it. And this was occurring at the same time that the whole women's movement was starting to move.

LK: Do you think that influenced--

AH: Oh, yes. I think it helped. I think we would have probably been years in making the progress that we made if it hadn't been for the women's movement, too. But on the other hand, there were things being done that we didn't approve of, or you know, that I didn't approve of, you know, that were a little too radical for me.

LK: Right, right. Well, it really speaks to just all of the varying levels of the women's movement.

AH: True.

LK: I mean, it wasn't just for or against ERA.

AH: No, no.

LK: You know, SWE was for ERA, but then maybe not agreeing with some of the other issues.

AH: Exactly.

LK: Where some of the women who were anti-ERA were--

AH: Exactly. There were a lot of little sub-issues and situations that you had taken for granted, that all of a sudden started to change a little bit. And it was, well, maybe that's worth fighting for and standing up for. And it was kind of an exciting time period, frankly. Yeah, a little exasperating at times.

LK: You were also invited to the White House, weren't you--

AH: Yes, yes.

LK: -- while you were SWE president?

AH: Uh-huh.

LK: And that was for a presidential meeting of women leaders?

AH: Right.

LK: Do you remember that meeting?

AH: Oh, yes.

LK: Can you talk a little bit about that?

AH: Yes. Many of the issues being discussed were not really pertinent to SWE. You know, they were more of the getting laws changed, a little bit more radical than we were. We were a pretty

conservative organization. But it was fascinating to be there with the women and to have some of the marvelous people who spoke to us, including the president, President Carter.

LK: Do you remember discussions about technology?

AH: Not many. I brought up several issues concerning women's place in technology and advancements. But most of the discussions were for social issues.

LK: Were some of the other women leaders, did they have opinions about feminism and technology, do you remember?

AH: Not many. There were some who felt that technology was a villain, that it was -- how do I put it? I don't -- because I never did quite understand it. (Laughs)

LK: Well, as an engineer, how did you feel about someone saying that technology was evil?

AH: Yeah, yeah. And it was difficult to kind of confront, because there were a number of people who had -- women who had very deep-seated beliefs, and they weren't -- no open mind for discussion. And so you just kind of like shrugged it off and went ahead with what you did. But it was an interesting time period. We had gone from women didn't have a voice to all of a sudden probably we had too much. (Laughs)

LK: Or competing voices.

AH: Uh-huh, uh-huh. But it was -- it was interesting. It

was interesting.

LK: What do you think your most significant contribution to SWE was when you were president?

AH: Oh, boy. I'm not sure I really had one, except perhaps organization, trying to pull us together as one body, and one voice, to gain more power and more influence, and to get people to know who SWE was. That was my main kind of thrust, was to try to get us out there.

LK: Is it hard to have one voice when a lot of activity goes on in different local sections and then there's a national level of activity?

AH: No, I don't think so. I think really we all kind of like weave together, because, I don't know, working at the local level I think is where it's really at. At the national level you're frustrated because you really can't do too much. I mean, you try to lay out broad plans, you try to get people involved, but the action takes place at the local level. And I think I did some good as president, but I think I probably have done much more good through the years at a local level. It's kind of a -- it's hard to explain.

LK: Well, it seems to make sense to me the way you explained it.

AH: But I believe in this organization. That's, I think,

the main thing.

LK: When you were president, there was also the issue of not holding conferences or conventions in states that hadn't ratified ERA.

AH: Uh-huh. And that was voted in the CSR and became our guiding light for a while.

LK: And I think I remember reading you wrote letters to the governor of Georgia, to the state of Georgia, and all the governors in every state.

AH: Uh-huh.

LK: But there were some women in SWE who felt that that was isolating the members who were in those states. Do you remember discussions about that?

AH: Yes.

LK: Can you talk a little bit about that decision?

AH: Well, it wasn't really a decision that I supported. I mean, once it passed, yeah, I'm president, and I'll have to enforce it. But I felt that it was a little too radical for our organization.

LK: Do you remember what other people's feelings were on it?

AH: Yeah. Many people felt that we needed that position to wake other people up.

LK: In the engineering profession?

AH: Yes. And that the fact there were other people -- and I was kind of on the --

LK: On the fence?

AH: -- fence on this one, that felt that, you know, these are women's issues, not engineer's issues. And how far you go one way or the other was very controversial at the time. And we did a lot of soul searching. I did a lot of soul searching as to really what -- how far to go and what to support and what not to support. It was just a period that was very intense.

LK: Yeah. From a personal perspective, were there other times in your life where this multiple identity or dual identity of being a female but then being an engineer -- did that ever come up for you? Did you ever feel like you had to pick? Or do you feel like it's a natural--

AH: Well, I don't know.

LK: Kind of a philosophical question, huh?

AH: Well, you know, it is. And it's a difficult question, because I really don't remember ever feeling that it was an either/or. It was a little bit of this and a little bit of that. I don't know, I really don't.

To be an engineer, pure and simple engineer, is hard and fast, and you've got basic rules and things to follow, and a pattern. But that's not life. You don't live that way. (Laughs)

So the big question was: Are women engineers any different from the male engineers? I mean, really, this went down to at that point in the women's movement going on: Was there something very different about women engineers as opposed to male engineers? And I never felt there was too much difference, but there were a lot of people who did. And it was just the time period, a lot of things going on, a lot of different viewpoints going on. And that's good, that's good, you know. It made me think.

LK: So after you were president of SWE, and then you still were active as a past president and a member, and right around that time, the early '80s, that was the first launch of the Space Shuttle, do you remember that time or that event, and do you remember how you felt about it? I mean, having worked on the Gemini, what was that like?

AH: I remember standing on the roof of a ten-story building at the Cape watching a launch (sighs), and then listening at the controller saying, "No joy, no joy, no joy."

LK: This was when you worked on Gemini?

AH: And the damn thing blew up at the edge of space. We couldn't see it, you know, but it did not go into orbit around the world. And I guess that was one of the lowest points in my technical career. It was a hurt. It felt personal. I don't know. I remember when -- an Apollo landing where we almost lost

the crew, you know, before we got them out. And Buzz Aldrin had been my desk mate earlier. And it was a very personal thing. You felt it, you know, that we almost lost them. There were high points and there were low points. They were exciting. It was wonderful to be a part of it.

And when it finally settled into kind of a routine, you felt lost. You really did. You missed that adrenaline shot every once in a while, that really -- and it became -- space travel became, you know...

LK: Do you think Americans started to take space travel for granted?

AH: Yeah. I think they overestimated our capabilities, and therefore when we had failures, it really hit hard, that they didn't -- they weren't anticipating it.

LK: Like the Challenger?

AH: Uh-huh. But probably it was needed. It was needed, because I think the public had become almost jaded and accepting, and they thought everything was going to happen, and it was all going to be great, and they didn't have to worry about anything anymore, and you know, it was no big deal. And the sudden realization that there was a big deal was probably a good wake-up call, within the industry as well. I think we became a little bit -- oh, what's the word I want? We expected success. And to lose

friends is always tough.

LK: The Challenger loss was extremely painful for SWE.

AH: Yeah, indeed.

LK: Can you talk about that a little bit?

AH: (Sighs) Well, how do we -- I don't know. I think that we had become a little bit more expectant of our -- not expectant, but accepting of --

(INTERRUPTION IN RECORDING)

LK: Okay, we're back. You have something in your hand.

AH: Yes. I keep this very close to me at all times. It's, one, an eagle, which has a very special meaning for me. I've always been very fond of eagles a great deal. But the wording is what counts: "Dream what you dare to dream, go where you want to go, and be what you want to be." And I think that kind of sums up my life.

(Laughter)

LK: Do you have any final thoughts, Minta, about the Society of Women Engineers?

AH: Well, it's played an important part in my life, of course. And I think -- I hope it's important for the lives of many, many of our members. I feel blessed that I have been in the position that I've been in through the years, from starting out as a committee member and section president and on up, because I

think that it's been -- what's the word I want? Certainly it's helped define, I think, what I am, what I have become. And without it I would be a different person.

LK: Do you have any advice for young engineers today?

AH: I've been always a little leery of giving advice. (Laughter)

AH: But there is no doubt that I urge young women engineers, in particular, to become active in SWE, because I think it is important for us to learn to lead, to set goals. And you don't have too many opportunities on the job to do those things sometimes. Take advantage of any opportunity you have to develop the skills that you can use on your job, not the technical skills of engineering, but the leadership skills and the fellowship skills. It is so important to take advantage of the experience and viewpoints of the other people you work with, because through them, I think you learn some of the things that are absolutely vital to life, for success in life. That sounds awfully serious, but... (Laughs)

LK: Well, I think it's important.

AH: Well, I do too. And I thank SWE very much for giving me the opportunity to practice and develop skills in an environment that is not as critical as on the job. I think that's important.

LK: Finally, Minta, you know, we're sitting here, and behind

you, this glorious backdrop, almost a tribute to your heritage.

AH: Yes, my American Indian, my Cherokee heritage.

LK: And we have a few minutes left. But can you talk a little bit about how being an American Indian has shaped your identity as a woman or as an engineer?

AH: I don't think I've ever thought of it that way, but --

LK: Or just your life, your individuality in general?

AH: Well, I am very proud of my Cherokee heritage. And I've studied a great deal about things that have made the American Indian be able to rise above some of the very horrible things that have happened through the years; and on the other hand, to lead, I think, in ways that are not quite traditional in Europe, but they're a different way of thinking, a little bit, and -- but that's kind of nice. It's hard to explain, but I'm very proud of my Cherokee heritage. I'm down to, you know, not a really big percentage anymore. But I remember my great-grandmother talking to me of her life and growing up. And it was very exciting to know that my family took a part in making Oklahoma opened up to the whites, and that the working together of Indians and Europeans kind of, well, helped to develop and, I think, bring strength to our country. And I'm proud of that.

LK: And in your career, were you ever active in AISES [American Indian Science & Engineering Society]?

AH: No. I've thought about it at times, but I just -- too many other things going on.

LK: Yeah, yeah. But are organizations like that important?

AH: Yes, I think so. I think so. You know, you have to make decisions as to which organizations you stick with and you go with. And in my case, most of them have been SWE involved.

AH: But you can only do so much, and you can spread yourself too thin, and that's difficult, too. But I wish I had had an opportunity to know my relatives, my ancestors, a little better, my great-grandmother, particularly. But we didn't live close, and it was just maybe once or twice a year when we went home to Oklahoma that I got to see her. I'm proud of my Indian blood.

LK: Do you think there's a need for a SWE today?

AH: Yes. It may not be the SWE that I knew when I first joined. But I think that the young engineer needs a support organization, needs reinforcement, reinforcement of values that SWE brings about, not for everybody. It isn't an organization that I expect all engineers to belong to. But like many other things, it's a little bit of what you put into it affects what you get out of it. But yeah, I think it's still needed. And I urge young people to consider it, to help women engineers.

LK: Well, I think that's a good ending for our interview.

AH: Thank you.

LK: And I want to thank you very much.

AH: Well, thank you. This has been an interesting experience.

(Laughter)

LK: Okay. We'll stop now.

END OF INTERVIEW