PROFILES OF SWE PIONEERS

ORAL HISTORY PROJECT

Betty Preece Interview

June 7, 2003

Chicago, Illinois

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Betty Preece

Betty Preece was the first female electrical engineering graduate of the University of Kentucky in 1947. Upon graduation she worked as an engineer for General Electric and then as a project engineer/section chief of surveillance systems for the Air Force Missile Test Center at Cape Canaveral during the early years of the aerospace program. She went on to serve as editor of the *Indian River Engineer* for the Institute of Radio Engineers in the early 1960s. After earning a master's degree in science education, she became a high school physics teacher and adjunct faculty member at the Florida Institute of Technology for over 20 years. A Fellow of the Society of Women Engineers, Preece was particularly active in career guidance for women engineers and scientists, leading workshops on the local, state, national, and international levels. She was elected to the Florida Advisory Council for Science Education in 1986 in recognition of her work in science education. Preece passed away in 2009.

In her 2003 Profiles of SWE Pioneers Oral History Project interview, Preece discussed her education at the University of Kentucky; her early career at General Electric; her career as a teacher; her involvement in the space program; and her involvement in SWE.

- July 2016

INTERVIEW WITH BETTY PREECE, JUNE 7TH, 2003

LAUREN KATA: It's Saturday, June 7th, 2003. This is an interview with Betty Preece, fellow of the Society of Women Engineers, for the SWE Oral History Project. We are in Chicago, Illinois. The interviewer is Lauren Kata. I'd like to first start by thanking you for participating in the project.

BETTY PREECE: You're welcome.

LK: Betty, can we start with you describing your family background and growing up?

BP: My parents both graduated from eighth grade; that was it. I was the first one in my family, cousins and what-have-you, to graduate from college. I started college at sixteen. I finished my engineering degree when I was nineteen.

LK: Wow. You grew up in Kentucky.

BP: I grew up in Kentucky. I was born in Illinois, but I grew up in Kentucky. I went to the University of Kentucky. I was there during the Second World War, and so we had a fair number of women. We had maybe six or seven women, most of them in architect or civil engineering. But another woman, Marie Kemper and I were the first two women to graduate with electrical engineering degrees at the university.

And incidentally, I met with Marie about a month ago in Cleveland. It was our first time together in ten or fifteen

years, so we really enjoyed it.

LK: Oh, that reunion must have been nice.

BP: Yeah, it was.

LK: Let's back up a bit. Did you always know that you wanted to be an engineer?

BP: No. I never knew an engineer. I never met one. But I didn't want to be a teacher. I wanted to be something other than a teacher. And I guess the spark came from a physics teacher who let me, with another student, play around in his lab after school hours sometimes. But I don't know where I got the idea. Actually, I wanted to be a chemist, but chemistry classes were full and I couldn't get in, so I took physics. And so somehow or another after that I decided that I wanted to be in engineering. And as I say, I never met an engineer. I really didn't know what they did, but it wasn't teaching.

LK: Right, right. Do you feel like that was a big pressure for women to go into teaching?

BP: No, no. It was just I didn't want to do it. It wasn't anything else.

LK: Did you have experiences with technology or science outside of school when you were young? No?

BP: Huh-uh, none. There wasn't a lot of technology around then, believe me. Radios were about it.

LK: Right, right. But just in terms of schools or--

BP: Not at home. My father was able to do anything with his hands like that, but he never encouraged us to work with him.

LK: You had siblings?

BP: I had a sister, younger sister.

LK: And you went to Lafayette High School --

BP: I went to Lafayette High School. Where we lived in Fayette County, there were two high schools. If you lived in the city you went to Henry Clay, if you lived in the county, you went to Lafayette. So most of the people who went to Lafayette were farm oriented, they were farmers, so we had a lot of interest in farming activities. And you could take sort of a path toward Future Farmers of America and this sort of thing by taking some of those kinds of classes. But there was no college track; there were no guidance counselors. It was, okay, this is what you want to do, so you do it.

LK: And did you always know you would be at the University of Kentucky?

BP: Well, I guess, because it was cheap and I could live at home.

LK: What was it like being in an engineering program during the war?

BP: Well, at the university we had ASTP [Advanced Student

Technology Program] Army -- I don't remember the words, but it was young Army people who were going to engineering school before they went to the Corps. of Engineers or this sort of thing. And we had a lot of those at the university. There were some civilian men, and there were, I guess, five or six women at the time. Some of them graduated, some of them didn't. I don't know if you want their names. I can remember most of them.

LK: Sure.

BP: Bobbie Nolan, Ann Phillips, Alice Phillips, Ellen Zigler, Bobbie Neal and then Marie Kemper that was the electrical with me. So they were there. Some of them were married and their husbands were serving someplace else overseas. Some of them left and didn't return because the war got over.

I can remember when the war ended. I worked at the radio station at the university. The university had a radio station. And I actually had a license that permitted me to run the transmitter.

This was WBKY. It was one of the first university campus radio stations in the country, I think. It's still there at the university. But we ran programs, and we made recordings on plastic discs. They were on plastic celluloid discs, and we sent them to Louisville to WHAS, the big station in Louisville. We'd record these programs. We had live programs in the studio.

People talked, sometimes they played music and things like this.

So I was a studio operator. I'd run the control system and did recordings, and then had this permit to run the transmitter.

LK: And is that related to your involvement with the Institute of Radio Engineers at all?

BP: No. I didn't join the IRE [Institute of Radio Engineers] until I was out of school. My husband joined IRE, but I joined the AIEE, which was American Institute of Electrical Engineers. And those two combined, and they're now IEEE [Institute of Electrical and Electronics Engineers]. But he belonged to both; I belonged just to AIEE until after I graduated. I can't remember, I think it was after we moved to Florida I joined the IRE.

LK: How did you meet your husband?

BP: He was a student at the university in electrical engineering.

LK: So your first job after--

BP: Well, I worked at the university. Only one half of one term did I not work, because my family couldn't afford it. At that time, the tuition at the university was thirty-five dollars a term. And that's how much my parents made in a week, so it was a big sacrifice. So I worked to get my pocket money, to buy my books. They paid the tuition, and I pretty much did the other

stuff on my own. So I worked in the research library on campus. I worked in the office of mechanical drawing. I graded drawings for the professors in mechanical drawing. Then I became, I don't know what you call it, sort of the assistant to the head of the electrical engineering department. And I made all the schedules for all the students, counted up that they had enough credits to graduate, made sure that they carried out whatever they were supposed to do. And I did that for, I don't know, the last year or so I was at the university.

LK: Wow. Okay. So your first job working for GE (General Electric) really wasn't your first job.

BP: Oh, no, no. I'd worked before. When I was in high school, I worked in the summertime on the campus at the high school. They had a program, electrical technicians -- they didn't call them electronic then. But they were part of an Army program, different than the one at the university, and they went to school there on the high school campus. And I worked in the summertime serving at the snack bar, and when school was on I was a cashier on the cafeteria line. And I had worked in a department store over holidays. I started working as soon as I could get going at it, so I'd worked a lot. So GE was really not a first job, but it was a first engineering job. But I went to work for GE--

LK: Were you recruited or--

BP: Yes, a recruiter came. And at the time he came, jobs were fairly plentiful. When my husband graduated three months later it was almost impossible to find a job. It was like it is right now. But I got the second highest wage of any graduate in electrical engineering. I got $52.50 a week. And he got $5 a week more than I did because he was a veteran and he'd had experience. So I was recruited and I went there. Marie Kemper went to work for Lewis Research Lab in Cleveland.

LK: What types of work did you do at GE? You were a test engineer?

BP: Well, GE has a program where people coming to work for them go through a thing called a test program. And you have, oh, two, three, four different assignments in various parts of the company to see if you find a place and they find a place for you to fit. And the first place I worked in, I went to Schenectady from Kentucky. And it was the coldest winter they'd ever had. The Hudson River froze all the way down to New York City. We couldn't get fuel oil. Places were like -- if you had more than fifty or sixty degrees in your house, you know, you were bad, and they were really unhappy. But I went to Schenectady.

And the first job I had there was in a research lab that was building salt-water batteries for submarines. So they put the plates together with little glass balls between them to separate

the plates. And they ran seawater through them so that they would generate electricity.

And that was my first one. And the test programs lasted three months, four months, something like that. Then in Schenectady I went to motors and generators. And these were the huge ones, I mean, like you get in a power plant like Hoover Dam or something. And we used to get inside those things to take the temperature measurements, inside the cage of the thing.

And then I went to Philadelphia for GE in a test program. And I worked on a thing called a network analyzer, which today was a forerunner of a computer. It was probably as big as this room. I mean, it was huge, and it had all these vacuum tubes. And the whole time I was there, we kept trying to make it run long enough to do any data analysis. So it was interesting.

And then when that finished, I went to work for GE. I went off the test program and I went to work for GE in New York, actually, in Long Island City for the service shop. And our portion of the shop repaired small motors and generators. So they would come into the shop not working, and then the shop would examine them, and we'd tell them, this is what you do to fix it. A lot of our business then was rewinding motors from sixty-cycle to fifty-cycle to go overseas. We did a lot of work with that. So those were my two main jobs there.

But I need to go back and tell you something else. When I was at the university, I worked in the machine shop too. I forgot about that. I worked in the machine shop for Freddie Mangusen. And I had to have jeans or pants or something. And I went to a store downtown to buy them. And I said to the woman in men's pants store, "I want a pair of jeans or pants to wear in machine shop." And she gave me this long tirade about how women should not be doing things like this, that that was not a job for a woman, and I should be doing something other than that. And this was during the war.

LK: What did you say?

BP: I said, "Well, I can't help it. That's what I need." (laughter)

LK: Wow. That is funny. Were you the only woman working in the machine shop?

BP: Oh, yeah. Well, there was a secretary. But the main service shop was in New York City, and we had this one for the small items in Long Island City. And neither place had any women except each one had a woman in the office as a secretary, and that was it.

LK: Were you doing any supervising in that role, or just working on a team?

BP: Well, I don't know that it was a team. There were two

of us. There was a fellow who was, I guess you'd say the scheduler, the manager of what came in, and I did the engineering part of it. So I guess it was a team. And then there was a shop foreman who parceled out the jobs to the guys in the shop, and said, "You do this, you do this." And then when it was finished, I was supposed to check it out to see that it was working right.

LK: Were there ever any problems with you being the only woman?

BP: No. I always felt that I was treated like a queen. (Laughter)

BP: I mean, they were very respectful. They were very eager to work with me. I never had any problem with anybody. And you know, to go back again to when I was in the university, I've had a lot of people say to me, "What kind of harassment, what kind of stuff did you get when you were in the university?" And the answer is none. Absolutely none. They were happy to see us. And everybody there, the students, the faculty, treated all of us just like they treated anybody else. We weren't that special to them. We were students just like everybody else was a student.

And this really makes people who say, "Well, early women were harassed, and they were -- done this and done that." But I never saw any; I never felt any. Maybe I was lucky.

LK: Yeah, that's wonderful, though. Well, everybody has a

different experience.

BP: Yeah. Once when I first went to work at GE, a fellow sent me to the tool crib for a left-handed screwdriver. So I went to the tool crib, and I asked the guy there, I said, "They want me to get a left-handed screwdriver." And I said, "Where do you keep them? You don't have any, do you?" And he said, "Oh, no, no, no." And you know, he was in on it. So I went back and said to the fellow, "He's awful sorry. He's all out of them today." (Laughs)

LK: Oh, that's funny.

BP: So you know, but that was -- it was a fun thing. It really -- you know, it didn't bug me that much. I knew what he was doing. But it let him have his fun. And that's the way that you get along with people.

LK: Yeah. Did it help that your spouse was also in engineering?

BP: Not at that point, we weren't married. We weren't married at that point. He worked out on Long Island, worked for Pilotless Plane Division of Fairchild. So he worked out there, and I worked in the city, but we weren't married then.

LK: Okay. And was it a tough decision to move from Schenectady to Philadelphia, or was--

BP: No.

LK: -- it just the job was offered and you took it?

BP: That's the job that was offered, and so I moved. But I knew when I went into the program that that's what was going to happen. I was going to be three months here... And some of the women I knew from the test program -- there were a lot of women in the GE test program. I mean, I was one of maybe ten or twelve at the time. And we sort of kept in touch for a while, some of us.

LK: Who were some of the other women? Do you remember?

BP: I can't remember any of their names. There was only one that I was really kept up with afterwards. And she sort of dropped out and quit corresponding maybe twenty years ago. I don't know what happened to her. So I never had close relationships with them like I did with Marie.

LK: Did you ever run into other women within the Society of Women Engineers who were affiliated with GE, or--

BP: Oh, yeah. There's lots of them. I don't know who they are, but I mean -- I know there are -- I've met a lot of women in SWE who worked for GE.

LK: How did your family feel about you earning your engineering degree and going after all these jobs?

BP: Well, when I said I wanted to be an engineer, my father wasn't too sure. But behind my back he went to the university and he asked them. He told me he didn't think they'd let me in. So

he went to the university and he asked them if they'd take me. And if you can believe it, the person -- the professor with whom he talked was the only professor on the whole faculty who had a daughter who had graduated in engineering.

LK: Ah, what luck.

(Laughter)

BP: So Professor Bureau was delighted to have it, and then so I went there.

LK: That probably made your father feel better.

BP: Yeah, yeah. My parents were very encouraging. They never said I shouldn't do it. It was a struggle for them, but they were willing.

LK: That's great. Well, can you talk about how you first heard about the Society of Women Engineers?

BP: Well, when I was working for GE in Long Island City and my husband-to-be was working out in Long Island, he accepted a job at what was then called the Joint Long Range Proving Ground, which is now Patrick Air Force Base and part of Kennedy Space Center. And so at that point we decided to get married. He went to Florida to accept this job, and I was to come, and we were going to get married in Kentucky. And no sooner did he get there than they sent him to California from February until September.

And so when he came back, then we got married in Kentucky on

the way to Florida. So moving there was not a problem. So at that time it was -- he was one of the first groups of engineers to be hired to work on the Range.

LK: Was that in 19--

BP: 1950. And the Range had only opened in like the late part of '49, early '50. So he was in that first group.

LK: That must have been exciting.

BP: Yeah. It was a lot different. They had wild animals and all sorts of things going on. And every time they shot something it blew up. (Laughs)

So just before I moved to Florida I went to a meeting of SWE, and I'm not quite sure what it was, but in the Barbizon Plaza in New York City. And then I moved to Florida. And one time when he came back north, he went to Philadelphia for some training, and we visited with his folks on Long Island. And while I was here I went to something with what became SWE. I don't know what the activity was, it's sort of vague. I went to like a meeting or something, and then we went back to Florida. So this was 1951. It would be spring, like March of 1951. So it was about the time that SWE was incorporating. I wasn't there, but my number was 510017.

LK: Yeah, because you filled out an application and joined.

BP: Right. I joined in '51. I was the seventeenth person

to join in 1951. Isabelle French has a '51 number too. And now they've thrown them all away.

LK: The numbers?

BP: Yeah.

LK: Well, they're still in the archives.

(Laughter)

BP: Yeah.

LK: Why was it important for you to join SWE? Do you remember?

BP: I don't know. I thought it would be interesting to meet other women in engineering. I didn't really know any in New York, and I just thought it would be interesting, and so I did.

LK: Was it refreshing to meet other women in the same situation?

BP: Yeah, it was interesting. It was interesting.

LK: And so when you relocated to Florida and you didn't have that network, you decided to start your own?

BP: Right.

LK: Can you talk about chartering the Florida Section?

BP: Well, long before we chartered the Florida Section, I had a little file box. You know how you have a recipe box?

LK: Yeah.

BP: I had a file box of women in science and engineering in

Florida that I had collected. And we tried to organize, and we tried to organize a number of times before we finally made a section. And I believe Judy Kersey was the first president of the Florida section. I don't know when it was. It must have been in the early, mid '50s, something like that. I'm not just quite sure when it was chartered.

LK: We have that information.

BP: Yeah. But we used to meet once a year. I'm not sure if it was always the same time of year, but we met at different places around the state once a year, and we used to have a little conference. And we collected a little money, and they used to pass this few hundred dollars on to the group that was going to do it the next year so you'd have seed money. And that was what eventually led to the formation of the Florida Section, which covered the whole state of Florida.

And we didn't have that many members. I don't know how many signed the charter, but there couldn't have been maybe more than twenty or thirty that ever came to meetings. It wasn't a huge number, because they were spread out all over the state.

LK: Were they spread out across industries and disciplines as well--

BP: Yeah.

LK: -- or was there a concentration--

BP: No, I don't think so, not at that time.

One of the members that I remember -- I can't remember her name -- was a woman whose husband was founder of what became Embry-Riddle Aeronautical School. They used to be in Miami, and she was one of our members at that time. Since she was involved with the school, she used to have woman students occasionally, so she would tell us, "Here's the name of somebody who's a woman student." And so there were two schools, and they amalgamated and became what's now Embry-Riddle Aeronautical University in Daytona Beach. But I can remember that she was one of our members.

LK: Who are some of the other early members? Or do you remember?

BP: You mean of the Florida Section?

LK: Uh-huh. There was you, Judy Kersey.

BP: Well, Michelle Mingoia and Lisa Bird, but I'm not sure -- and then there was another one. I'm really bad with names.

LK: Okay. Well, just--

BP: Yeah, there were a few. We actually chartered, I believe, the Central Florida Students Section before we chartered the Central Florida Section. And I was a student -- I was a faculty -- not the faculty -- the SWE counselor for that section, and when it started, the student section. And then we had the Central Florida Section. And then twenty-six years ago now, we

chartered a section at Florida Institute of Technology, and I was the SWE counselor for that one. We actually had our twenty-fifth anniversary. Carolyn Phillips, who did the installation, came to our twenty-fifth anniversary and was a speaker.

LK: Oh, that's great.

BP: And the girl who was the president of the chartering, we still keep in touch. She lives in Atlanta.

LK: Oh, that's great. I mean, for many people, SWE has really stayed in their lives.

BP: Yeah, yeah.

LK: Is that true for you?

BP: Very much so. I mean, I know I can go to engineering things any place in the country, doesn't matter what they are, and I know somebody that I've known through SWE, every place. And that's good.

LK: Is that different from your other engineering groups, or--

BP: Well, yeah, I guess. It's the only engineering group in which I'm really active. I belong to some others, but that's the one that I'm most active in, is SWE.

LK: Let's switch gears a minute. Can you talk about going on and getting your masters degree, and how you eventually came into being part of engineering education and not the industry side

of it?

BP: Well, it started at the first ICWES [International Conference of Women Engineers and Scientists] in 1964, at the New York World's Fair. And when they'd announced that the second one was going to be in England, I said, "I'm going to go." My husband's family all lived in England except for one aunt who lived here. And so I went back to what was at that time called Brevard Engineering College, and I knew a fellow who was the -- I don't know what you call it -- he was in charge of the faculty, setting up the schedules and so forth -- Ray Work. And I'd known him for a long time. And I said, "Hey, Ray. I want to go to this thing in England. I want to teach. Can you do it?" And he said, "Sure." And I started teaching. I taught tech writing. And in my tech writing, I had about twelve students, and there were only two whose native language was English.

And I taught a couple of math classes. And then I went to engineering drawing, and I taught engineering drawing. I was teaching twenty contact hours a week in engineering drawing during the Vietnam War, when kids were going to school to keep from going to war.

LK: Was that challenging sometimes?

BP: I loved it. I really enjoyed it. It was great. My husband was actually called to active duty during the Korean War.

And when he was called to active duty, they said that what he was doing at the Cape with the launching of the missiles and so forth was so important that they sent him back to his original job while he was on active duty. So at this time I was busily trying to earn money to go to ICWES II. And I made it. I think that answers your question, I don't know.

LK: Yeah, how you came into--

BP: Teaching. So then what happened next was -- the space program is sort of different than a lot of others. When a program is over, they fire everybody. Everybody is let go. And then you rush around and you try to find another program so you can get connected to that one. Well, this is what happened. Up until Apollo, my husband had been able to switch from one to the other to the other to the other. But at the end of the Apollo, it was wholesale layoff. People were pumping gas, doing anything they could do to keep from losing their homes. And he had to take a job out of town.

And I went to my Sunday school teacher, who was the superintendent of education in our county, and I said, "Dr. Brown, I've got to have a job. Ray's lost his. He's got to go up north if he's going to keep one." And he says, "Okay. Why don't you go over to Mel [Melbourne] High and teach physics?" And I said, "Well, I don't know if I can do that." And he said, "Sure you

can." So he sent me over there and they hired me on the spot. So this was in the spring.

During the summer, I went to Florida Tech, and I got tutored by a physics department friend that I'd known, a very retired gentlemen, who tutored me in physics so that I could teach in the fall. So that's how I got involved in teaching.

And to teach, I had to have a certificate. So to get this certificate, I had to have so many hours of education and all this sort of stuff, so I discovered that if I did that, I might as well get the masters degree. So I was going to two universities at the same time taking classes so I could finish my degree within the time to get my certificate. My husband was out on a carrier in the Pacific.

So it was hectic, but I did my thesis and I got my degree. So I got my teaching certificate, which was really what I needed to have. So then I taught. I was certificated in five areas to teach. And then after that I just taught there. I taught science education back at Florida Tech to undergraduate students and to graduate students. And I was active with SWE activities, and with the students at Florida Tech, the SWE Student Section. Ever since we chartered I've been active with that group.

And we did some summer programs that the department had for young women. I actually met a young woman that I still correspond

with there who went to that program. But it was like an NSF [National Science Foundation] Grant. It wasn't NSF, but it was called JESSI, J-E-S-S-I. And its object was to get girls into engineering. And so we would hold activities. I would recruit women I knew to come in and talk to them. We'd try to hold an open house. We'd try to do all sorts of things to get girls and women interested in going into engineering or science.

LK: Do you feel that those activities were effective?

BP: Well, I guess some of them went there. I don't really -- you know, how do you know what happens to most of them? You don't, unless there's one or two, maybe, you catch up with. But during all that time we were working on trying to get together the Florida Section.

LK: And I guess what I'm interested in is how you see how engineering education has evolved since you started teaching, and since you...

BP: How has it evolved? Well, we don't teach a lot of things we used to teach. In fact, for example, I taught engineering drawing. And I quit teaching engineering drawing because it became no longer a required course. And we didn't have computers, so there were no computer courses. Brevard Engineering, which became Florida Tech, started as a graduate school for the engineers in the space industry. And so it started

out having only graduate courses at night. And then when the war started and students became anxious to avoid going, we began to have daytime students.

LK: You were teaching both the parts of that program when it was -- you were saying that it was mostly evening courses you were teaching there?

BP: Yeah. I wasn't teaching evening courses. I was teaching the daytime courses when they started with those. Well, I did teach a couple of education courses for science education majors after I started teaching at the high school. So I think that's the best... Okay.

LK: Do you feel that the university -- well, obviously, the university was connected to the space program, but do you feel that as an educator you were connected to the space program?

BP: Well, how could I help being connected to it? I used to work with NASA, go up there and take groups, or get people to come and put on workshops. I mean, I'm still doing this now. But we used to get them to interact with us. But my husband was involved in every single space program that ever came through, so how could you not be involved in it?

LK: Can you talk a little bit about that experience, I mean, even from a social aspect, what it was like being involved in that during that time?

BP: Well, everybody thought it was a wonderful opportunity, and everybody was anxious to find out what you could find. NASA sort of came on the scene later. Actually, the beginning stuff was with the Navy and then the Air Force. We actually left Florida in 1954 because the Range Operation was taken over by a contractor from the Air Force. And we were gone for four years -- three months here, three months here. He was a field test engineer.

But I met a lot of SWE people. I went to California and I met SWE people. I went to St. Louis and I met SWE people. I went to a couple of SWE conventions in California. I went to LA Section meetings. I can remember going to a conference there when I had a one-year-old in a stroller.

And I went to a conference in, I don't know, Anaheim, LA, I don't know. But I was in California at that time. But I met a lot of SWE people. And it was a way of connecting. But this is something I try to do. Whenever I go to a place, like I would come to Chicago -- and it's different because it's WEPAN [Women in Engineering Programs & Advocates Network] today. But if I normally go to a place, I look up the SWE people. And I said, "Are you having a meeting, can I meet with you," or something. So I do this, or I go to a campus.

I do a program called SEES (Students Experiencing Engineering

and Science) every winter for the American Association of Physics Teachers. So we move around the country doing this. And every time I recruit SWE students, and if possible, SWE members to help out. And we do hands-on activities for a hundred minority students. We bring them on in[to] the hotel, we do the activities. And so I always involve SWE people with this, we've always done that. So I get students and I get actual SWE members to come and participate in these activities.

So when I go there, I'm meeting SWE people. And it's great, because in many cases I said, "Ahh, I know somebody here." And that's really great, because if you come in, if you know somebody, you get much better results than if you're going cold.

LK: Well, yeah.

BP: And so this has been a great way to meet a lot of SWE people.

LK: Can you discuss how you were able to balance being involved in all of these activities and then raising a family?

BP: When my children were small, I was teaching at Florida Tech. They were in high school when I began teaching in the high school, so there wasn't that much.

And both of them went off to university away from home. Our younger son wanted chemical engineering, and the only school in the state of Florida was Gainesville, so he went there.

Unfortunately I had to pay, because if he'd gone to Florida Tech it was free because I taught there. And our other son also went to Gainesville and ended up getting a degree from Florida Tech and coming back home.

But it wasn't that big a deal. And our household never had a real schedule because my husband would work this launch and he'd be there nights or days or whatever, and then he'd work this launch and it would be something else. So we were accustomed to call kinds of irregular schedules. And we never missed a launch, so we always ran down to the beach to watch the launch just go.

LK: Oh, what was that like?

BP: Fantastic. But we live on what's called a barrier island, right about thirty-five miles of south of Kennedy -- what's now Kennedy Space Center and Cape Canaveral. And so we just go down to the end of the street, and there it is, clear shot, you can see them.

And if we don't want to do that, we just go out in the backyard and watch them when they get above the trees. But it's always -- we still go. We never miss a launch. We still go out and watch. And it's the same with everybody that I know. "It's a launch! It's a launch! We're going to watch this," and we do. So you know, everybody who lives there is so involved in the space program that you can't not be involved in it unless you're really

a hermit.

LK: That's what it sounds like, yeah, even if you're not an engineer.

BP: Yeah. But your mother may be a lab tech, or your mother may be a secretary that works here or a manager of something. Your father is this, your mother -- you know, your uncle is this, your big brother is this, and everybody's involved in it. So everything is sort of -- everybody feels -- it's really a community sort of thing. There's a real feeling of we're part of the space community.

When the Challenger went down, I had my physics class out on the field. It was a bitter cold day, and we were doing -- we were dropping balls to see how long it took them to drop. And we looked up and we saw it. And the kids said to me, "Is it supposed to do that?" And we knew it wasn't. So we went back inside the room. Everybody sat down. The principal came on the loudspeaker and said, "We don't know what's happened." And everything stopped in the whole school for the rest of the day. Nothing went on, except we sat there and listened and tried to -- and everybody was really upset. Some of the kids cried.

And the same thing with the Columbia. We were watching it on the TV because it was landing. And my son worked on the Shuttle. He put the tiles on the Shuttle, on the Columbia.

LK: He did?

BP: He did.

LK: In what capacity?

BP: He was a tile setter on the Columbia when they first built it.

LK: At Rockwell or--

BP: No, no. The tiles were put on at KSC (Kennedy Space Center). And he worked at KSC, and he put the tiles on the Columbia before its first flight. And when he watched this on the TV -- we were all together -- he said, "It's gone." You know, when they lost the signal, he said, "It's gone," and he was right. So he was sort of closely connected to that one.

But my husband knew all the astronauts and he worked with them. He worked on all of the shuttles. He worked on Apollo, he worked on Gemini, he worked on Atlas, he worked on -- you know, you name it, and he worked on it, so we knew all the people. And unfortunately they're dying off like flies right now. We've been to about five or six funerals in the past two months of people that we worked with.

LK: It seems like so many people have been involved. You know, it's not just the astronauts.

BP: Yeah, yeah.

LK: You know, the scientists and engineers.

BP: Yeah. A group that I do some work with had a butterfly experiment on that Columbia that went down, so they were pretty upset, because I don't think they got it back. They got some things back, but I don't think they got that back.

But we worked with students trying -- there was a program -- I can't remember the name of it -- where you could design an experiment, and if they took it, then you had to pay -- raise the money, and they'd -- I don't know how much it was, $1,500 or -- and they'd put it on a shuttle and it would go up in space and come back. So there were a lot of groups involved in that, a lot of school children involved in some of those projects, and a lot of workers, space people.

LK: Yeah, that's a difficult side of it, there's the exciting side of it--

BP: Yeah, very. Yeah, yeah. We can remember sitting there when John Glenn was in the capsule. We watched that, and that was pretty bad -- not John Glenn -- Gus Grissom -- when Gus Grissom was -- and the other two were burned up in the capsule. And one of the spacecraft that my husband worked on is in the Smithsonian. So when we go to the Smithsonian, we go look for his spacecraft. It was an Apollo spacecraft. We go look for it. Sometimes it's there, sometimes it's not.

LK: That's really neat.

BP: So now we have many, many more women in engineering. In the sections we have, I think five Florida sections of SWE.

LK: And you've helped charter--

BP: Two of them.

LK: The Space Coast Section?

BP: I helped charter the Florida Section, and then the Space Coast Section. And then I was SWE counselor for the UCF, University of Central Florida, and the Florida Tech Student Sections. And I'm still counselor for the Florida Tech Student Section.

LK: You enjoy working with students?

BP: Yeah. We have a good time together. We do a lot of things.

LK: When you were at, I believe it was Florida Tech, you created a program called An Engineering Day in the Park.

BP: Yeah, something like that. I can't remember the right name. We did a lot of things like that. We'd pick names for them, and we'd try to get girls to some and parents to bring them, and working engineers, women, to come and talk to them. We'd hold teas, receptions, and call them all sorts of things. Sometimes we'd do activities with the girls.

We did -- what's the Math/Science [Network]-- Expanding Your Horizons. I did Expanding Your Horizons a number of times with

the Florida Tech area as a place to do it. We've done that. The Space Coast Section is actively in a lot of these things now.

But I tutor, and I tutor nine hours a week -- Monday, Tuesday, Wednesday, from 3:00 until 7:00. So I don't very often go to Space Coast Section meetings, because by the time I would get there, it's over. And then I work two days a week at the Civil Engineering Squadron in the Patrick Air Force Base.

LK: Can you talk about what you do there?

BP: Yeah. I have a title. I'm called the Accessibility Coordinator for the 45th Civil Engineering Squadron. So I go there two days a week, and I have a wonderful time. And I go around and I examine facilities, programs, drawings, all this sort of thing, to see if they're accessible to persons with disabilities. And if not, then I make recommendations on what needs to happen to bring them into compliance. I hold training programs. You know, I do a lot of things like that at the base. And I have pretty free rein at the base to go in and look at just about anything and come back and make a report on what's required or what should be done to bring it into compliance. They don't always do it.

LK: I was going to say, have you seen any of the applications?

BP: Yes, yes, a lot of them. Yeah, yes, a lot of them, but

a lot of them don't happen, but we try. So I'm a volunteer for this. I do this for fun.

LK: You also seem like you've been a mentor to a lot of different women, maybe within SWE or just as an engineer, maybe.

BP: Well, I told you the girl who was the president of the first chartering Florida Tech Section lives in Atlanta, Sylvia Mastenbrook. And we've always maintained a close relationship. I've been a mentor to a high school student in a program called Take Stock in Children, in Florida, for seven years, eight years. I'm on my third student. We pick them up at seventh grade and go through twelfth. But the program started, and so some of the early girls I only had a couple of years. But this one now I have, I'm starting a third year in the fall with her.

I've mentored girls from Florida Tech, from the student section. I help them get scholarships, listen to their problems when they have problems with professors or projects and so forth. I don't know if you call that mentoring, but we like each other. I work with international students. I'm working with some international students now who are working in degree programs.

LK: That's great. Have you ever had anyone you would call a mentor in your career?

BP: Well, I guess. When I was in high school, the physics teacher who let me in his lab. I had an algebra teacher in high

school -- I hated math, absolutely despised it. And I had her for an algebra teacher, and when I got through, I loved it. I had the head of the EE (Electrical Engineering) department at the university, who sort of took me under his wing as Marie and I worked through that, who was always encouraging. The faculty was very encouraging, but he was especially, he and his wife. And we felt like we belonged to the family there.

But I get such tremendous support from my husband. Okay, (Laughs) he says, "If you want to do it, okay." And so he helps me do things when I'm running out of time. Like last night he was counting things for me for this workshop we're going to do tomorrow. You know, we're going to do a workshop for 150 Girl Scouts tomorrow, hands-on, here in this hotel as part of WEPAN. And so the girls are going to earn a whole badge as a result of this activity.

LK: From your perspective, what are the differences between SWE and WEPAN?

BP: Oh, entirely, totally different. SWE is students and adult members, professional members. WEPAN is made up of the people who run the engineering minority -- women in engineering programs and minority engineering programs at universities. That's their field. They are people who run those programs, that's WEPAN.

LK: I mean, there's obviously some crossover.

BP: Oh, yeah, yeah. Some of the people from WEPAN are SWE counselors, SWE faculty advisors and so forth. But they're two separate groups, but they both work on trying to encourage women minorities into engineering. So the cross is there, but it's not exploited, I guess is the right word. But Betty Shanahan and I are going to do a booth for SWE at WEPAN.

LK: Oh, good.

BP: So this is the first time -- not the first time. We did one at -- Walter McFarland and I did one in Puerto Rico, and someplace else. I'm not sure where.

LK: It seems like there are a lot of organizations that are developing in the last few years around the idea of encouraging young people to go into math and science and engineering.

BP: Yeah. AWIS is one. But AWIS is primarily biological/life science faculty-type researchers. So AWIS is another one.

LK: Association of Women in Science?

BP: Right. IEEE, ASME [American Society of Mechanical Engineers], ASCE [American Society of Civil Engineers], all the engineering societies are busily having groups now that are concentrating on women and minorities. So all of what they call founder societies have programs for women and minorities. So

there's a lot more interest now. In the past, maybe ten, fifteen years, these societies have begun to be very active. And a lot of the founder societies are well heeled, so they can pour a lot of money into these programs that SWE's not able to do, because they're supported by such a large membership. I mean, IEEE has hundreds of thousands of members all over the world.

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

BP: Yeah, if only to go and meet my friends.

(Laughter)

BP: But we're always continually surprised at how many guidance counselors don't really know what an engineer does, and how many students really don't know. And guidance counselors have six or seven hundred kids. How much time do they have for one? Not much, because the school districts load them down.

So we're looking now at a much younger group. In our state, in the eighth grade, you make your plan for the rest of your time in high school. And if your student hasn't had exposure to the need for math and science before eighth grade, that student is not going to choose it. They're going to choose something -- she will choose something that's a lot easier, that's a lot more -- what should we say -- easier, but not only easier, but people look on people who take science and stuff sometimes as nerds. I mean, that's not really the right word, but it's that sort of the thing.

And so they want to be popular, so they take the classes that are popular with popular students, a lot of them. So it's that way.

LK: What would you say are your greatest contributions to the profession?

BP: Oh, God, I don't know that I've made any. (Laughs) Probably the things that I've done with students over the years. You know, maybe out of all the kids I've seen, maybe two percent of them actually came into engineering or science. But you never know, and occasionally you meet one. I mean, I go on planes, and I meet somebody who says, "Mrs. Preece! I haven't seen you in years!" And so then you find out what these students are doing, and they're huge successes. One of my students, it happens to be a guy, but just got elected to the National Academy of Engineering.

So you know, you sort of live through your students' experiences like a parent. You know, a parent says, "Oh, my kid got this and this and this and this," and you're sort of that way. Well, he was my student. She was my student, and look what she did.

LK: That's great.

BP: So I don't think engineering-wise, I've made any contributions in engineering. I don't think I was ever in a position to make big -- although, when I worked at the base in

1951 to ‘54, I was a project engineer for surveillance systems. I was actually the first woman engineer to be hired on the Range, the Eastern Test Range.

LK: Is this like missile surveillance, or just general--

BP: Well, what we did was, we went out and surveyed the launch area to see if it were safe to launch. We had airplanes that had radar in them. We had boats that had loudspeakers in them. We had little aircraft that had loudspeakers in them where the boats couldn’t get. We had ground-based radar that would look for aircraft in the sky. And we’d put these systems together while I was a project engineer for this project. And that ended, as I told you, when the Range was taken over by a contractor and we moved to California. But that was about -- I worked there more than three years, about half the time I was the project engineer for this project.

LK: Do you enjoy academia over industry, or do you just find them to be different, or--

BP: I don’t know. I just like to keep my hand in. I like to know what’s going on. I try to read and know what’s going on in my field. And you probably know I’ve been involved in the American Association of Physics Teachers, pretty actively. Currently I’m chairman of the Women in Physics Committee for that organization. And we’re having a Women in Science Day and Women in

Physics Day. We've never had this before. We're having a session of three women leaders in physics, three women researchers in physics, all of whom are internationally known. We're having two sessions on Women in Physics From Florida, who are talking about what they're going to do. We're going to do a cracker barrel on -- which is just a group discussion on hot topics for women in physics.

LK: Wow, you're busy.

BP: We're having a luncheon for all of our invited guests, along with the Minority Committee. So I've been active in that group. They've given me a lot of opportunities. I mean, I've traveled overseas a lot with them as a teacher, a physics teacher.

LK: You're also involved with the SWE Editorial Board?

BP: Right. I'm on the SWE Editorial Board, yeah. I write for that sometimes. I recruit people if I can.

(Laughter)

BP: Yeah, yeah, I do that. I'm on the Communications Council -- I'm not sure what the right word is. There's a SWE Communications Council we started last year. We've been in action about a year, trying to bring together all of the SWE literature, videos, websites, to be common, so they have a common message, so that they look the same, we don't have this here, and this here, and that there. It's slow going, but we're working on it.

LK: Do you have any further experiences that you would like to share today, Betty, or thoughts?

BP: Yeah. I've been active in students with disabilities. There's a group called High School High Tech, which is sponsored by the Department of Labor, and it's a program for girls and boys with disabilities in grades seven through twelve. And we mentor those students. We take them out to universities; we take them to work places to meet people with disabilities. They do summer internships. We help them get scholarships. And I've been pretty active with that group.

LK: That's great. Do you feel that the profession has become more diverse as it has evolved?

BP: Well, yeah. More people are getting -- more people are feeling that they can be successful in engineering, a lot more, a lot more people. And SWE has done a good job in this. I mean, we've struggled, and we've made a lot of contacts. And I think SWE is a contribution to everything that we try to do. If I didn't, I wouldn't pay my dues -- well, I don't have to pay my dues, I'm a life member, but (Laughs) I wouldn't have given them a life membership. So I don't know if there's anything --

LK: No, that's great. Well, I want to thank you very much.

BP: Okay.

END OF INTERVIEW