SWE STORYCORPS INTERVIEWS

Frances Scholl and Aubree Osborn Interview

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Society Of Women Engineers National Conference

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This oral history interview was recorded October 26, 2007 at the Society of Women Engineers National Conference in Nashville, Tennessee as part of StoryCorps, a nationwide initiative of Sound Portraits Productions to record and collect oral history interviews. A copy of the audio recording of the interview has been deposited at the Walter P. Reuther Library and Archives of Labor and Urban Affairs, Wayne State University. The interview may be used for research and educational purposes only.

Fran Scholl and Aubree Osborn

Fran Scholl is a mechanical engineering consultant and project manager at the consulting firm Affiliated Engineers and a member of the Society of Women Engineers. Because her father did not approve of her career choice, she surreptitiously studied architecture at Kent State University in the late 1960s while officially being enrolled in home economics. She left school before completing a degree, but was hired by a mechanical engineer and began working in the field. She received a bachelor's degree in mechanical engineering in 2001 from Tennessee State University.

During her 2007 StoryCorps interview, Scholl described to her coworker, Aubree Osborn, her unusual path to engineering; her father's resistance to her career; completing her bachelor's degree more than 30 years after she started it; the challenges she faced as a woman engineer; and her advice to both women engineers and to those interested in careers as consulting engineers.

- July 2016

Aubree Osborn: My name is Aubree Osborn. I'm twenty-six years old. Today's date is October 26, 2007. We're in Nashville, Tennessee. And the relationship to my partner is we are coworkers at Affiliated Engineers.

Frances Scholl: And my name is Fran Scholl. I'm fifty-eight. Today is October 26, 2007. I'm in Nashville, Tennessee. My relationship to Aubree is a coworker at Affiliated Engineers.

AO: So Fran, how did you become interested in engineering?

FS: It was an accident waiting to happen. I started off, like, arranging leaves in the front yard and trying to make houses, and have rooms and design stuff with boxes with a girlfriend down the street. And realized as I went on that I wanted to be an architect really bad.

So I studied mechanical drafting in high school, back in the sixties when things like that didn't happen, so I was the only girl in the class. Took drafting for three years, and the fourth year my father said, "You are not going to be an architect. You are going to be either a secretary or a home economics teacher." And my instructor, Mr. Frye (???), said, "Fran, you have the ability to be an architect if you want so go ahead and do what you need to do to

pursue your career." And you know, that's a little unusual in the sixties, with parents having the right to sign [for their children's courses]. So I took typing and shorthand my senior year in high school, and signed up at Kent State to study architecture, except—No, I'm sorry. What I did was I actually had to sign up for home economics, and studied architecture. So my father never asked, Why am I taking physics and calculus and Sewing I. And I was lucky enough to never have that discussion. So I studied architecture for three years. Kent State had the riots. The school closed, and I moved to California and got hired by a mechanical engineer. And I desperately needed the job and found that I loved the work. So that's how I became a mechanical engineer.

AO: So what were you doing for the employer in California?

FS: Designing plumbing systems, lighting systems, fire protection systems, and drafting.

AO: Did you get that job because of your experience you had at Kent State or because of your drafting experience you had in high school?

FS: Both, because at the time CAD [computer-aided design] was not even thought about. It wasn't even a dream so

everything was hand-drafted. So I had basically six years of drafting at that point.

AO: And how long did you work for them?

FS: The first firm was for four years as a consulting engineer.

AO: And what did you do next?

FS: Oh, then I decided I should work in contracting. And I thought it would be fun to find out what happens when you actually build the building, and how does all that system work. So I worked for a contracting firm as chief engineer, actually, for ten years and designed clean rooms and labs and stuff in California.

AO: And you did this without a formal mechanical engineering degree?

FS: Oh yeah. Absolutely. (laughs)

AO: Wow. That's impressive.

FS: Oh, don't go there. (laughs)

AO: Did you father know what you were doing and did he support it?

FS: Oh no, he never knew. And unfortunately in the process my father crashed his plane and died, so he never knew. And I went back to TRW where he worked as a chief engineer and saw everyone at the funeral. And they all said, You know, your dad couldn't tell you, he would be proud of you. But he really—he wouldn't tell me but he told everybody how proud of he was that I was actually an engineer. And he was an engineer, so why he fought that I don't understand. (laughs)

AO: Wow. When did you first become involved with SWE [Society of Women Engineers]?

FS: Actually, I went back to school while I was in California, trying to get the professional—to get the PE [Professional Engineer] license. So I went back to San Francisco State in the eighties and I was with SWE [Society of Women Engineers] as a student member then. And I don't remember much about the organization at that time because it wasn't supported in the industry. However the Exploratorium in San Francisco has a great place to introduce engineering to students. And so SWE took the Girl Scouts there for the night. And we spent the night there, and we each taught them different areas of our expertise. So I took thermal dynamics and covered, Why does a glass sweat, and, How does

a pan work when you're cooking?, and things. And four of the mothers that night decided to get into engineering. So it was sort of fun.

AO: Quite and influence you are, then.

FS: Yeah.

AO: So when did you finally finish your degree?

FS: Actually, in 2001. It took me some——'68 to 2001 to get a degree in something. So I have three years of architecture, associate degree in interior design, and ended at five years of classes——350 units——with a mechanical engineering degree.

AO: Fantastic.

FS: And that was actually in Nashville, Tennessee at Tennessee State [University].

AO: So how did that feel when you finally got that degree in your hand?

FS: That was hard to describe. I didn't think it would mean anything. But I decided to be the gray-haired old woman that walked down the aisle. And I was the oldest student

there and I was really quite proud. So it was fun. Don't make me cry. (laughs)

AO: I'll try not to. (laughs)

FS: (laughs) Sorry.

AO: So, where were you working at the time when you got your degree?

FS: I was actually a consulting engineer here in Nashville with SSOE [Group]. And my senior project was to modify the design line for Saturn [Corporation] and design them a ventilation system for what they call the end of the line. When they first fill the vehicle with gas and then you have to start the engine and that's all done in a plant, so I designed the finish line for Saturn at the time. So that was my senior project. And then other projects after that.

AO: That's a big project to do.

FS: Yeah. It was fun.

AO: Wow. So what about your career now? What are you doing now in your career?

FS: Actually, I've sort of reverted back to the fun things I did when I first started in California with the clean room

designs and stuff. I work for Affiliated Engineers as a project manager. And so all the things that I've learned over time, like designing lighting or plumbing or HVAC [heating, ventilation, and air conditioning] or how plants work, has actually pulled together to become fun engineer and design with a team different projects across the country.

AO: Sounds like fun. So what have you seen in the changes of women in engineering over the course of your career?

FS: You know, I don't know that I've ever respected the fact that there has been a lot of changes that have occurred. I've just sort of gone with the flow. I've always tried to encourage anyone—whether it be female or male—to get into the business because engineering is a lot of fun. But what happened is—when I started we were using the slide rule and we would check the first calculator to see if the answers were correct with the slide rule. And now you would never dream of doing that because you know that calculators can be trusted. But we didn't know that when we started. (laughs)

AO: What are some other big changes, then, that have occurred over your career?

FS: Obviously the computer. We used to do everything on a typewriter and if we had to type equipment schedules it would be done on a typewriter, and then luckily by then Xerox machines finally were around because it was mimeographed when I first started in the business. And we used to stick those notes onto a drafting piece of paper and issue a set of documents that way, whereas now you just do it all on the computer. So a lot of changes in that regard.

Still not a lot of women in the business. I wish and I would like to keep encouraging that more girls start in the business. But I've not run into many in each of the [engineering] organizations until SWE. This is phenomenal to see this many women here today.

AO: How interesting, all the changes that have happened over your career. Do you think that the students of today have any idea where engineering has come in the last forty, fifty years? Have an appreciation for it? Or do they need to?

FS: I don't know if they need to or not. I think that each person, as we work in this business, needs to take pride in what we do and continue on with it. Whether I shoveled snow or walked to school ten miles is not, I don't think,

significant in where they are today. I think the challenges are, though, we're being expected to engineer faster and make decisions quicker and I don't know that the human brain has gotten there yet. Emails, you know, are instantaneous and we used to not answer our, or get mail but once a day, but now we're looking for mail all day long. And as a result I think the customers are asking for quicker—And I think the students still need to appreciate that we need to take time to make sure that this is an integrated process and we don't make the wrong decision because we're in a hurry. Did that—I don't even know how I went where your question went, but that's okay.

AO: Well that's okay. So we're at the career fair here today. We've had a lot of questions about what consulting engineering is. We work for a consulting engineering firm. What does the definition mean to you of consulting engineering?

FS: One of the things is it's partly being a detective. I think a lot of my engineering career, to be a consulting engineer, is I need to take in a lot of information. And then absorb that and understand that and understand the processes through experience, and through education, and through consultation through other people. And then come up

with a solution based on the questions that we've been asked to do. So as a consultant I may have advice to give, but I think about ninety percent of our work, really, is detective work to know what is the right answer.

AO: So are there any skills or courses that you maybe wished you would have taken or gotten more experience in that would help you with your career today?

FS: Oh my goodness. I have three hundred and fifty units of classes, and all the professional time and all the other, what you would call professional development, vendor classes and things of that nature. I think one of the things that I had that is not offered in the normal curriculum is technical writing, which is different than English and is different than some of the others. Being able to technically write in a cohesive way I think is critical, and that helps you then communicate as well.

AO: What about engineers getting the stereotype, maybe a little geeky, or maybe being overly technical. What about skills to be able to convey your knowledge of a subject to those who maybe are less technical?

FS: I think as students today, as I've understood, want to take more and more Web classes. I don't think they're going to

have the people skills. I think getting involved in an organization, be it ASHRAE [American Society of Heating, Refrigerating and Air-Conditioning Engineers], ASME [American Society of Mechanical Engineers], SWE, bowling, anything where we get out and talk to people. I think we tend to become very narrowly focused if we don't pay attention to people and have the eye-to-eye contact—that's important to learn to read the language, you know the, non-spoken language as well as the spoken language. That's why conference calls for meetings are very difficult, because you can't see what someone's thinking and you can't read their language.

AO: Isn't that the same with email today, too. I know that's what we've been talking about a lot at the office, is the fact that email communication is so hard to read because you're not able to get that voice—

FS: The voice.

AO: —the facial confirmation of whatever it might be. And do you see email as being something that is going to continue through the future? Or do you think there's going to be new ways of communication that might help that?

FS: I think we use email for a number of reasons, and sometimes it's an excuse to not go see someone or talk to someone on the phone even. And I wish I could foresee the future. I certainly wouldn't have seen where we are today, as far as computers and the challenges with that. I hope that we learn a better way to use email for the right purposes and not just the, "Hi, how are you," because that's not the same as talking to a person and really getting to know that person.

AO: So what's been your biggest challenge through your career?

FS: My biggest challenge is overcoming the stereotypes that women aren't in engineering. It really has been—even today it's a little difficult. I'll go to an ASHRAE meeting with my husband, and I've been involved with ASHRAE for a number of years. It's very technical, it's what we do, it's they who provide all of our technical background for what we do. And they'll walk up to my husband and say, What do you think about that new chilled beam design? And he'll look at them and say, "I don't know. I think you better ask my wife." And I have to be careful, too. Sometimes I'm not used to other women being in the industry as we get out there and do things. So that's really the toughest piece. Everything else seems to be pretty easy.

AO: Wow.

FS: (laughs) Sorry.

AO: No, that's fantastic. That's very interesting. I know you told me a story before about a time when you were working for a previous company when you got a phone call as the head of the mechanical engineering department.

FS: Oh that was——uh-hm.

AO: I love that story. Can you share that?

FS: Oh, all right. Somebody had called the desk downstairs and they had said, "I need to talk to an engineer." So the girl sent the message up to me. I picked up the phone, "Hello, this is Fran speaking. How can I help you?" "I told the girl I needed an engineer, and I don't want to talk to you." And I said, "Well I'm sorry, sir, but I'm the chief engineer and if I can't help you I don't know if anyone else in my department can." And I don't remember the question. It was so simple. It was like a two second answer and he was happy and off he went. (laughs) But it was such an impression, that "I don't want to talk to you. I want to talk to an engineer." I think he had——I don't know what he had thought.

AO: Do you run into that often?

FS: I try to wear my SWE pin or my ASHRAE pin so that they understand that I'm in the business. And yes, I still do. I ran into it on the plane the other day. I looked over someone's shoulder and I knew it was a vendor who sells geothermal systems, and he was not interested in talking to me too much. And so at the very end of the flight, as we were standing up I said, "And how many bore drills do you think you recommend for that particular system?" So the language that I used immediately sparked his interest. Then he was interested in selling me—What company do I work for? What do I, you know, How can he get involved? And I said, "I'm sorry, but if you didn't want to talk to me as a human, then you're not interested in me as an engineer." And I wouldn't take his information.

AO: Good for you.

FS: So I'm sort of bad, I guess, but you know.

AO: That's not bad. (laughs)

FS: Yeah. (laughs)

AO: That's fun.

FS: Yeah, I do play with it a little bit. It's gotten better over time. And at Affiliated I certainly have received a lot of respect and there's never been any indication of, Women can't do the business. And it's exciting to see the number of women engineers that we have at the office.

AO: Especially recently. The last two years we definitely have a——

FS: It's about time. Yes.

AO: ——large group of new graduate engineers that are women.

FS: I love it. I love it.

AO: What advice would you give them about their career and how they could make sure they're making the most out of what they're doing?

FS: The big thing that they need to do is get as much training as they can continually, not think that because they're done with the degree that they're finished. Another thing that I think is critical is if they can get their license as a Professional Engineer, they need to do it because there's an issue——I've always carried around that I've never been good enough, I shouldn't do it, I should have been doing something else. I tease sometimes of making donuts

for Saturn instead of being the engineer for Saturn or Nissan. And I think that what we need to do is—and I do too—need to continue training. At my age I can't quit. I need to keep up with everything, with technology. Be proud of what we do. That's hard sometimes for women to be proud as an engineer of what we do because we're more nurturers. And I think they'll do well.

AO: Good. What about, particularly at our office, at Affiliated, the roles of support staff and how they're being used? I know in the past there's been issues with, maybe not making them feel as important as they could be. How do you see nontechnical roles getting involved with project work or getting involved with growing the business in general?

FS: I use the project coordinator a lot. And I don't mean "use" in the wrong terms—I depend on. And I don't think that as a project manager, as an engineer, you can do everything yourself. We have to understand that it takes everybody. If we don't have the right person at the front desk answering the phones we don't have a representation. That's the first person our clients talk to and meet, and that gives them an impression. And so that person has to have the experience and the knowledge and the understanding, and the same with

the coordinators. I expect them to be as knowledgeable as myself and I know they may not have that same education, but I try to share with them why I do what I do, what I'm looking for, and help them teach them the things that I do, because to me they're the right hand. Because we just can't do it all ourselves.

AO: Good. So what do you think about master's degrees and PhDs in engineering? Do you think that's something that needs to happen for someone to advance their career? What are your thoughts about that?

FS: Wow.

AO: I know there's a lot of struggle out there, especially with, you know, new graduates coming out of school and knowing if that's what they want to do or if that's what they should do to get ahead.

FS: Right. That's a tough call. I think experience is critical. I had an instructor with a PhD that did not have any what I would call the common sense side of life in engineering. A lot of it was books. And as a learner and as the detective that I am, I always challenged the thought processes. And I don't think it matters if the PhD is there or not as long as you can use that, you know, in a common sense way, as

well as the knowledge base way. And it probably depends on the field that you go into. What I do, I didn't need that.

And I know the university wants me to come back and do my master, and I may, you know I may still need to think about that. I just—harder to compete with younger brains. My brain has to work harder to retain. (laughs) So if they can do it while they're young, I don't think education ever hurts. But they need to have that commonsense experience as well.

AO: Sure. What about influential people in your career? Has there been any people along the way that maybe have really carved your path for you or given you someone to look to as an example?

FS: Actually, my mother drafted for TRW during the war, and she never told me that and I didn't discover that until my grandmother gave me some of the work that she had drawn on the old canvas-type drawing paper that they used to use with the ink. But she did, as a child, teach me to be tenacious and to stand up for what I believe is right, be proud of what I do, try new things, don't be afraid of things, and not be discouraged by other people. And I think that was good given that my dad didn't want me to get into

the field. And another person is Y.Y. Clark [Yvonne Young Clark], who is an instructor at the university of TSU [Tennessee State University]. I met her through ASHRAE. She is a dynamic lady here in Nashville who has done a lot for a lot of students. And she's the one who kept prodding at me to go ahead and go back to school, so that's why I went ahead and finally did, you know, graduated in 2001. So what was that? Fifty-two or fifty-three years of age? So those would be the two that I would say are the most important.

AO: Sure. What about currently, at your current employers? Who are the people that you look to to help guide you, to help give you more technical knowledge, or help you maybe grow in your career and the role you have now?

FS: Actually, as a project manager I use the entire team, whoever is on my team, and I have a number of teams doing different projects. So I count on the team to work together. I'm not the head and tell them what to do. I sometimes am the follower, because I look at the team as like a cooked spaghetti noodle You can't push them anywhere but you can lead them along the way and make them feel important as you do that. I ask a lot of questions and take a lot of advice, actually, from every member of the team. But at the company, if there's——sometimes, more so this year

than ever, we've run across some things that the customers have asked that I don't feel are totally—they're not unethical but they're not practical. Whether you design a utility system, they want it done in three weeks. I know that an engineer is not going to do the best design in three weeks. So what I do is sometimes I'll talk to, like, Mike Broge, one of the principles, and say, "You know, I really want to stand strong on the six weeks. Is that okay? Is that going to hurt anything at the company?" So he's one of the people that I would go to often and sort of check on that.

AO: Sure. So do you see yourself as a role model?

FS: I have never seen myself as a role model.

AO: Why not?

FS: But I don't know why not. I guess it's—I'm always looking to other people, so I'm always seeing that I've been dependent on the team to do things and have not understood that I would be considered a role model. (To recording technician) I'm looking at her [Aubree] with a big frown here. (laughs)

AO: (laughs) Well you are one. I've heard it from several people.

FS: Okay.

AO: And it's neat for someone, technical or nontechnical, to be able to look up to someone who has had such a broad career in the industry and has done so many things and is where you're at now. I can definitely say that people who are currently working will look up to you and feel that you are someone that's very approachable, someone that they're not nervous to ask a question to. Where approaching other people in higher-ranking positions can be tough, because you don't want to appear that you're inadequate or that you're not as technically savvy as other engineers. And that's something that I've heard nothing but great compliments about your skills, that you're looking to other people for information so they will turn around and seek it back from you.

FS: Okay. And that would be fair because I don't think that there's any one way to do a design unless it has to do with life safety. And so I learned in that first engineering job when I drafted and designed something, I put my heart and soul into it and then the manager of the company came up and, "Well why don't we do it this way, change it all." And

I was heartbroken. I mean I probably stained the thing with some tears, you know, and he never saw that. But I had to learn to understand that there's really many ways to do things, and maybe he was a good mentor in that regard.

He taught me that it was okay to do it a number of ways, and so when I talk to people in the office and they have questions, I try to get their area of understanding in that, and then what we do is we work towards a solution. They'll probably come up with a solution. They just don't know it. But I try to make them see that there's many ways to get to it, and as long as it doesn't harm anyone their design is a good as anything. So maybe that helps that and maybe that's why I've never seen me as being the leader or the mentor of that, just I help them through their own solution.

AO: Okay, that's an interesting way of thinking about it. So what made you choose mechanical engineering?

FS: Well that was what happened when I started that first job.

AO: You knew it was mechanical right away?

FS: Well, he was a mechanical—that was what he did, he was a mechanical consultant.

AO: Sure.

FS: And they're drafting and I've got to live, I've got to pay my rent, and I didn't have time to find another job at the time. So I got into it and I was drawing ductwork and I had—you know, I said, "What is this?" And he'd show me and I'd say, "Oh, I did that at Kent." And then he asked me to start doing load calcs [calculations], and he started showing me the calculations and I said, "Oh, I learned that in an environmental class." So I showed him in the book and he said, "Okay, that's a good start but also what we do—." So it just happened. It was not a pursuit.

AO: Wow.

FS: Although I did tear my dad's Mickey Mouse watch apart as a kid. I had to see how it worked.

AO: So did you think that you would be going into something like project management or consulting? Was that a goal for you or did you just kind of stumble upon it?

FS: No. I think when I had a mechanical department here in Nashville, I had to find work for the team or the company was going to lay people off. And I don't believe we mess with people's lives that way. So I went out and found work

and managed those projects because they weren't involved with an architect, because there was an architect in the office. And so that led me into realizing that I could sort of see the whole picture. And so every, I think, job has always been an evolution. That's why I'm concerned when students come to the desk and they say, I'm studying this and this is what I'm going to do. I think that the internship helps them get past that and see that maybe there is something else out there that never looked glamorous but is actually a lot of fun and it's what they do.

AO: So how can we get the youth interested in engineering and knowing what it is and understanding the opportunities that it can provide. I know for me personally, you know, even when I was growing up I didn't know really what engineering meant until I got to college which was almost too late——

FS: That's too late.

AO: ——to get involved in something like that. So can you think of ways that we can educate maybe the youth about what engineering is and how it can play into their future?

FS: I think the grade——actually sixth, seventh, and eighth grade is almost too late. I think we need to start letting the

younger ones know that math has a purpose. We're not learning how to add, subtract, multiply, and divide just to do that. That there's an application. And I think we need to teach the application and let them understand where that leads. And then the counselors in school really need to advise students that engineering is a piece of a life. You know, I might have been an anthropologist if I'd known that had been available. Or I might have been a professional photographer. I love taking pictures. I didn't know those were professions. So I don't think we're introducing everything to the students. I think we think all the classes do that. And they don't understand the application and where that's going.

So I would think that if we want to get students in engineering—because that's what we do for a profession—I think we've got to start encouraging the sixth, seventh, and eighth graders that this math class isn't just a horrible—you know, algebra or something—but it really has a potential. If you fill your tire pressure one more PSI, calculus tells you what that means. And you weren't introduced to that, but if they understood that that calculation lets you know that the tire would wear longer, or the tire would perform hydroplane in water, or hold

better with snow—or, you know, if you understand that the ridges in your pan actually distributed the heat and the engineer had to figure out what those ridges were—it could make it more exciting to do something. And I think if we, almost if we took time to go to the school and sort of introduce to all the different careers and then said, "You know, this has really been fun. I don't do the same thing every day. In fact I've never designed the same system twice," you know they wouldn't think it was, Oh, boring, another air conditioning system.

AO: Sure. Well let's switch topics, because Fran is a wonderful photographer. And how did you get involved with photography?

FS: When I think I was four or five years old I was given a Brownie camera that you sort of looked down through and I think the film was like a 120 film. And I did take some pictures then and wanted to do it, but family couldn't afford the film and do things, so finally in the eighties a friend of me said, "It's fall color in Vermont." And she was going on a photo trip and I needed to come along. And so I had a camera at that time, never really cared how to use it. And went with a photographer and he was showing people how to compose pictures, etcetera, and I looked

through the lens and said, "Oh, they can do that? I can do that," and started doing that. Then joined a camera club and started entering competitions, and it developed from there. So it's been sort of fun.

AO: (To recording technician) Oh, if you ever see her photography, it's absolutely wonderful. She brings in cards to the office that we can buy and they are just beautiful.

FS: And Nissan is the—when I designing the Canton [Mississippi] manufacturing plant I had taken a trip to Antarctica and never showed anyone pictures. And they had a fit and, You're going to bring your pictures in and show them. So I took a slide show in and they said, Why don't you put those on cards? So I have to credit that to Nissan, for being willing to show my photography.

AO: Well, they are absolutely amazing. How important do you think it is to have a hobby like that? To balance work and maybe something that you really enjoy outside of the office?

FS: As we've talked, engineers get very focused and very into themselves. And I don't mean that in a negative way, just you have to spend so much time working through the processes in your brain as you come up with solutions.

That's only one side of our brain, and there's an artistic side. And if you start looking at things around you—like with a hobby like I do for photography or started learning to play the violin—it helps you get away from that thought process and opens up, to me, the color and the textures and all the details that go into everything that we do and walk around. And I think that helps make a better person. Besides, you have something besides engineering to talk about.

AO: What else do you like to do for fun?

FS: Well, the photography—and obviously then that puts travel in there. So like I said, I've done all fifty states. Now I'm trying to get all the continents in. I have Africa and Asia to go.

AO: And where are you looking to go in those countries?

FS: Oh boy.

AO: Any specifics?

FS: No, I haven't—too many projects right now at work, (laughs) so I need to recoup on that. But I would like to go see all the wildlife in Africa next.

AO: Oh, that would be amazing. What about travel with work? Do you do much travel for work?

FS: Oh yes. And actually I love it because there's a couple of challenges with that. Obviously you have quite a crazy schedule, you know. Tuesday I spent in New York, so seventeen hours traveling that day. But I like watching people and I like to notice whether I have the same flight attendant twice, and that's only happened—in thirty years of work, I've run into one flight attendant twice. And it happened to be this week. I saw the one lady the second time. And it's interesting because flight attendants used to have to be beautiful, sweet, young girls that were gorgeous, and this woman has probably been a flight attendant for a lot of years. I would guess she's in her early seventies.

AO: Oh my goodness.

FS: So I was impressed. Good for her.

AO: Wow. So travel for work. Is it stressful for you?

FS: No.

AO: I mean, you say that you like it, but our projects are nationwide. Is there a part of the country that you like to

be in more than the others? Or do you find a certain type of project more interesting than others?

FS: No. I've enjoyed every place I've been. I've been in Ames, Iowa and we've had three tornados in three trips, so I feel for the people that live there. New York is an every other week kind of a trip. Minneapolis, we were there two days before the bridge collapsed [I-35W bridge over the Mississippi River in August 2007], so I was very thankful that the team wasn't crossing at the time. So there's a lot of things to talk about as we see each of the different cities and each of the projects. I can't say that it's not stressful. That wouldn't be truthful. But at the same time, it's just a lot of fun. I just love traveling, so it makes a good—

AO: So what could the airlines do to make travel easier for business clients?

FS: (laughs) Treat us like humans. (laughs) I actually—the benefit that I get is traveling so much, they've finally moved me up to first class. So that's nice.

AO: (laughs) You get to eat food on plates, then.

FS: Yeah, peanuts and almonds now.

AO: Hey, it's better than what we get back in coach.

FS: Right, right.

AO: Well, what about your experiences? Have you gotten to work with any of the younger women in the office yet?

FS: Yes, and in fact I've had two projects——

AO: Do you notice differences?

FS: Well, yeah, a little bit. I think——and I've been guilty of this as well——I've always worked harder to make sure that everything went correctly. I didn't take my job for granted. And I don't think the young women do. I think they appreciate where they're at and what they've got, and they're very diligent and been very thorough on the projects. I've had two projects, one for Eau Claire university——University of Wisconsin in Eau Claire, sorry. And we have an all women group, so——

AO: Wow.

FS: ——we have Sarah doing the plumbing and Janice doing the HVAC, and myself as the project manager, and they have fun with that. So we tease a lot about, This is the all woman group here, and do that

AO: (laughs) Well, I'm sure it doesn't happen very often that that comes together and works out.

FS: That's the first time for me. Yeah.

AO: I'm sure it has to be the first time for Affiliated, as well.

FS: Yeah.

AO: Wow. Now do you find yourself in any type of mentoring role with them as far as being able to give advice, maybe career direction advice?

FS: I have always encouraged anyone in the office, if they don't have their license they should go get it. I think it just helps them and helps their internal perception of themselves as being a qualified engineer. Because I know there's always a discussion about whether you're a designer or an engineer in that business. And otherwise I try not to be "mom" but a lot of times in an office there's——it might not be a female, but somebody who sort of watches over and sort of watches what's going on and knows what's going on. So I sort of play that role a little bit. But never try to just give advice for advice's sake.

AO: Sure. So if I wanted to be a consulting engineer, what type of advice would you give me?

FS: I would recommend first go to school and get some of the background. That helps with this, and learn to—another good thing that I did was actually understand the [building] codes. I read the code books and don't have them—

AO: Exciting reading.

FS: Oh, it's not exciting reading, but I made it applicable to what I was doing. You have to be sure your passion's there, because no matter what you do, no matter what your career is, if you don't like it you shouldn't be doing it. So if you see that as something that you can understand as a passion and feel strongly that you could be proud of doing it, then I think you should do it.

AO: So you talked a little bit about this PE license. Did you take the test for your PE license?

FS: Oh, I did. Yes.

AO: Tell us about it. I've heard horrible things.

FS: It's horrible things. I couldn't find the location at first. Almost missed it. And my office sort of had a bet going that passing it the first time may not occur. And

they were sort of teasing about that. But it was—the PE exam really is usually what you do in your work. And that's what I had found. I used to do all my calcs by hand, I didn't use a computer when we started, and that's how that exam went so I actually finished it in four hours in the morning but two in the afternoon.

AO: Wow.

FS: So that was sort of fun.

AO: So do you have any advice for someone who's looking to take their PE test and what they—how they could prepare or what they should be looking at?

FS: It's more of, What do you do at work and how do you do it?, rather than the actual preparation of the test. I think that you have to know that you're ready as a designer, good designer, before you could go in and take the exam. Taking it just because you had been out of school for four years, if you've not done any of the fields, you shouldn't do that.

AO: What about preparation for it? How much did you have to study? How much do you think is appropriate?

FS: A lot of times they'll offer a class for that, and you probably could do it. I didn't have time to take the class. But because I had been in the business for twenty-five years at that point it was pretty well memorized.

AO: (laughs). I'm sure. I'm sure it was. So what about——thinking about, you know, getting your PE license, what does that really mean and what benefit does that have to someone?

FS: Actually it's taking an area of responsibility for the project. You look at that. And there's commitments. Different states, like Mississippi, have ethics involved and we have classes and that. So you have to, at that point——you take responsibility for the design. And I tease the customers, "I'm going to put my address and phone number in the concrete of their mechanical room floor and take responsibility for that." And they enjoy that.

AO: (laughs) Fantastic. Any other thoughts that you have, maybe regarding engineering or how people should get involved?

FS: Do it because you love it. And go at it with a gusto and a tenaciousness. And that would be it.

AO: Fantastic. Well, thank you, Fran.

FS: Thanks Aubree.

END OF INTERVIEW