Today's Women Design and Build Boeing Airplanes

Just over a decade after the dawn of powered flight, in 1916, women in Seattle stitched white Irish linen over spars crafted from Northwest spruce to build the first Boeing B&W seaplanes.

With a Boeing 737-800 behind them, Boeing engineers Lori Bechtold, left, and Peg Curtin hold a balsa-wood model like the one Curtin uses in career workshops for girls at middle schools and high schools.
From the first aircraft of a new company to the worldwide production and support of thousands of jetliners in service today, women have contributed significantly to the success of The Boeing Company.

Be it research, design, test, fabrication or fleet support, women at Boeing are creating products and services to meet the demand of the future.

Yet at Boeing -- as with the rest of the nation, there are fewer women in engineering careers than you might expect. According to 2002 data from the U.S. Bureau of Labor Statistics, women represent just over 10 percent of the engineers in the US.

"At some point in our lives we choose a career path," says Peg Curtin, a Boeing aerodynamics engineer. "In our case, it's one that wasn't expected."

Here, a group of female engineers at Boeing say how they became part of that 10 percent and what keeps them in it today.

"In 1967 I stitched together a kite for a high school project," says Curtin. "I liked sewing and here was something that felt more like it used math and science, subjects I enjoyed."

So she was ready to consider a career when she saw a brochure on engineering in her counselor's office. "It felt like I had found something that made good use of my skills."

Curtin's kite project led her to Notre Dame, where she earned bachelors and masters degrees in aerospace engineering, and then to Boeing. She now works with wind tunnels that blast high-speed air over models of new airplane configurations. Her computer runs computational fluid dynamics programs that predict how different shapes will perform. Curtin stays in touch with a worldwide community of engineers and scientists.

"I like to solve problems. Give me something to solve, I will analyze it one way, try something new and analyze it again."

Curtin's contribution will make new Boeing airplanes like the proposed 7E7 Dreamliner more efficient, quieter and easier to operate. She anticipates contributing to its development, like she did from start to finish on the 777 passenger jet. "It's cool to watch an airplane fly after working on it from the beginning."

Boeing mechanical engineer Jeanne Yu leads a team designing the cabin systems for the Dreamliner.

"To me, what's most rewarding is seeing our people come together to accomplish these complex designs."

Yu assembles Boeing designers and production experts, and those of suppliers, to make the cabin more and more people friendly. "I find out where the technology is ready and then find ways to bring it onto the airplane."

"In high school I enjoyed math and science," she says, but her career goals didn't include them.

"Then one day, my parents drove me to Michigan Tech University from our home in Illinois ? more than 800 miles ? to attend a workshop called "Women in Engineering." I listened to other women talk about their jobs and it was there that I decided I would become a mechanical engineer." Yu attended Stanford, earning an advanced degree in 1985.

"Now, I use my analytical skills to create the interpersonal environment that builds the right relationships. Finding the right people, creating ways to get the discussion going, and finding out what we need to learn. We pursue an ongoing creative team process to get best technological features on the airplane."

Lori Bechtold, a Boeing reliability engineer, designs by seeing how well products actually work. "I have a morbid fascination with failure," she said, "and I use my design knowledge to prevent it."

Bechtold is in the Boeing Phantom Works group, which creates new technologies for use on any Boeing design: spacecraft, military hardware, electronics and aircraft.

She evaluates commonly available electronics, like cellular phones, as components of the complex mix of electronic systems used on airplanes. "Can they pull high-Gs?" she asks.

"I can't remember a time when I wasn't interested in math," she said. Her father was a math teacher in New York. "Our high school had a math club and we would just devour the math journals that came into the library."

Bechtold followed her passion for math to the Massachusetts Institute of Technology in Cambridge, then to Boeing where another passion took hold: flight.

"I just soloed June 23 in a Cessna 172. With my hand on the yoke, I can feel what it's like for our customers," she says.

"A couple of years after we built the first 777, I flew on one as a tourist and it was beyond excitement to see the steward using the touchscreen I had worked on. I saw how it made his job easier.

"That's what I live for, improving someone's quality of life."

"In my senior year of high school," recalls Kim Pastega, "I was fairly strong in math and science and my counselor suggested engineering. I can honestly say that at the time, I didn't even know what an engineer did.

"I was always up for a challenge and didn't like to be told that I couldn't do something just because I was a woman."

Boeing engineers Jeanne Yu and Kim Pastega stand inside a fuselage section of a Boeing 777 model airplane under construction at the Boeing Everett, Wash., facility.

Pastega began her Boeing career as in intern before completing her degree in aerospace engineering at Iowa State University in 1991. She stepped into the Payloads organization and now manages a 125-person group that works alongside Boeing production crews as they manufacture the interior elements -- overhead stow bins, sidewalls, ceilings -- of Boeing commercial airplanes.

Her group integrates a full spectrum of engineering disciplines: design, manufacturing engineering, stress, numerical control programming, tooling and process engineering.

"I have always liked the broad overview of how an airplane comes together."

The challenge for Pastega, and all of Boeing, is the increasing complexity of technology. The answer, says Pastega, "requires the collaboration and involvement of many."

"Our team works very closely across the entire value chain."

Says Pastega, "My reward is the overall accomplishment of a goal. At the end, when the airplane is being delivered it is satisfying to know that I had something to do with it. The power of the team is tremendous."

Encouraging Female Students to Enter Engineering Careers

Across the Boeing enterprise, women engineers are taking a direct approach working with non-profit organizations and schools to encourage young women to enter careers in engineering and science.

Peg Curtin, Boeing aerodynamicist in Seattle's Commercial Airplanes unit, works with the American Association of University Women to lead twice-annual workshops for girls at middle schools and high schools.

Mona Simpson, director of Supplier Management and Procurement of Boeing Phantom Works in southern California, has been an active member of the Mexican-American Engineering Society for more than 15 years. She takes a special interest in working with Hispanic children to encourage them to continue their education, especially in the sciences.

Olympia LePoint, a systems safety and reliability engineer with Boeing Integrated Defense Systems at Canoga Park, CA, speaks with elementary, middle school and high school students about the importance of math and science through the DiscoverE Program in her northern Los Angeles neighborhood.

Candice M. Smith, an F/A-18 integration engineer in Boeing Integrated Defense Systems at St. Louis, meets with students in various grade levels through Boeing-sponsored school-visit programs in St. Louis.

In Curtin's workshop, she flies balsa wood gliders. "If a couple of girls walk away and think it is fun to fly, then I have done my job."

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