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Turning and Screw Machines

Building with Better Communication - Pg 22

In this issue:

. . .and much, much more!

Corey Bryant, lead machinist for Submersible Systems, sets up a Tsugami Swiss-style turning center equipped with live tooling and a bar feeder. The Tsugami is designed specifically for short cycle times and was purchased to cut production costs on the Spare Air and to eventually allow the company to bring in outside "job shop" work. The system features a Fanuc 31i-A dual path CN controller and 8,000-rpm main and subspindles for high-speed turning and reduced cycle times. The Spare Air product is CE certified and Submersible Systems, Inc. is currently undergoing ISO certification.

The Last Breath

Submersible Systems Inc. Manufactures "Spare Air," a Small Air Tank Designed to Give Divers a Few Last Breaths to Prevent Drowning.

Story and photos by C. H. Bush, editor

Necessity is definitely the mother of invention, proven once again by the invention of a small life-saving air tank called Spare Air by its machinist-inventor Larry Williamson.

"Larry is my father," says Christeen Buban, vp at Huntington Beach, CA's Submersible Systems, Inc., the company founded by Williamson to produce his invention. "He was a machinist by trade, as was his father before him. He had a small shop in Huntington Beach, where he produced parts for the aerospace industry, and, like many machinists, he was always tinkering with one invention or another."

"At some point Larry discovered a passion for scuba diving," says Tony Buban, company president and Christeen's husband. "From what I understand, he went diving every chance he got, and then on one dive he almost drowned."

"One night when I was about eight or nine years old, he went scuba diving in Catalina on a night dive chasing lobsters," says Christeen. "Very simply, he ran out of air and nearly drowned. He made it to the surface and was pulled

Submersible Systems president Tony Buban (l) and wife Christeen use of a custom-made Ansti breathing system (background) which simulates human breathing to test 100% of all Spare Air regulators before they are shipped.

out unconscious by the boat captain. That incident changed his life."

"Basically, he thought, 'There's got to be a better way,'" Buban adds. "So he looked around, and there really wasn't anything available that was a redundant air system for scuba divers. So, he said to himself, 'I can make something.' And he did."

James Bond Inspired

Christeen Buban says the James Bond movies were popular at the time, and, like the tiny breathing apparatus used in some of those films, her father wanted something very small, very lightweight.

"He wanted something really small," she says. "Scuba tanks are traditionally large with a two-stage regulator and they're very expensive. He was thinking of something James Bondish, something maybe back on the wrist that would deliver just one extra breath of air to give a diver time to reach the surface. But most people couldn't get excited about just one extra breath. They wanted five or ten. So, in the end that's what he did."

To create the Spare Air breathing system, Williamson had to re-invent the regulator.

"At that time, breathing regulators were two-stage devices," Buban says, "which meant they were too big and heavy. So Christeen's dad invented the concept of a single-stage regulator, which could be smaller and lighter, yet just as reliable. Without that single-stage regulator, our Spare Air system wouldn't be possible."

"Another important thing was that it is a balanced regulator," Christeen explains, "which means you can use it underwater in any position. The pressure equalizes and allows you to breath air with your normal inhalation effort. All scuba diving regulators are balanced, of course, but dad did it in a single stage, instead of two. It was very innovative and allowed him to produce a system with only 20 working parts instead of the 50 or so in other regulators."

Instant Success

Williamson patented his "emergency breathing system" in the late 70s, and was astonished by its immediate success.

"In 1979 her dad changed his company name from Williamson Machine Shop to Submersible Systems, Inc.," says Buban. "He put all his money in one basket and made 100 units and took them to the Diving Equipment Manufacturers Association trade show to see what might happen. He set up in a little 10 x10 booth with 100 units sitting there. They sold all of them, so he came back and started making brochures and advertisements. The rest, as they say, is history."

"Eventually, the product name was changed from the original emergency breathing system to Spare Air," Christeen says. "Five years ago, dad retired and allowed us to buy the business. We've been at it ever since."

View of a diver demonstrating a small Spare Air tank, designed for emergency use in the event a diver runs out of air. It has 57 breaths at the surface and is designed to get a diver to the surface from 100 feet down, normal diving depth.

Expanded Markets

Originally the Spare Air system was designed to save the lives of hobby divers, but then the military got wind of it and wanted to use it,too.

"We're close to the Tustin Marine base," Christeen says, "and back then they trained helicopter pilots there and sometimes when they flew close to the water, a wind vortex would cause them to flip over, causing several drownings a

Corey Bryant, lead machinist supervisor at the Mori Seiki turning center at Submersible Systems, Inc.

year. Apparently the pilots had heard about us, because they started coming in and spending their own money to buy Spare Air for themselves to carry on board their helicopters. Finally, some bigwigs found out about it, and that turned into a very large military contract for us. We now make a product just for helicopters we call HEED 3, which stands for helicopter emergency egress device. Also, we've sold thousands and thousands of them for use in the Humvee in Iraq. When those things turn over in the water, the guys need a way to survive long enough to get out. We eventually expanded to make a model for kayaking and another one for surfers."

"Once the orders started coming in '88, the company had to quickly quadruple production," Buban says. "The company moved into a new building and went from four employees to about fifteen overnight. Eventually we grew so much we had to move again, into our current much larger building."

Equipping for Spare Air

Including the production of the air tank, the Spare Air product is mostly parts that have to be machined and assembled.

"We knew we had to have a full-fledged in-house manufacturing capability," Christeen says, "so three years ago we bought a Mori Seiki turning center with live tooling from Ellison Technologies, and two years ago we bought a Tsugami turning center from them, also with live tooling and equipped with a bar feeder."

"At first, the Ellison people did some of the programming for us," Buban says, "but now our lead machinist Corey Bryant does it all. Initially we bought the machines to make five parts. Now we make 22 parts. With the Tsugami, we've reduced production costs 20%, plus we have more time available, so we're in the process of learning to accurately quote on some job shop work for other people to keep the machines busy."

"Our main goal is to keep our product price competitive, and the quality as high as possible," Christeen says. "We'll do that by improving manufacturing quality and cutting costs. My father built a fine company for us, and we intend to keep it that way." ■

Some of the parts that are produced to manufacture a Spare Air breathing system. 22 of the parts are now fabricated in house.