

Paul Keith

WELDER AND FABRICATOR

“I’m bending a radius on that titanium part. It’s like a weird-looking triangle, six or seven feet long and probably four or five feet wide. I think there was one on either side of the sub, port and starboard. It goes on top of the flotation foam and has long bolts go through it and the foam to keep the foam on. The curve lets it fit over the edge of the foam.

The machine is called a press brake. It bends metal. You put the piece of metal in there and the machine presses down on it, puts a bend in it along a straight line, like folding a piece of paper. But you can’t make a sharp bend on a thick piece of titanium, because it’ll break. If you want a curve, you make multiple small bends close together, so it gives an even sweep, so it’s nice and round.

Then I use that wood template I made that’s the actual shape they wanted. You hold that in there to judge that you’re getting a round shape. As you rock that template back and forth, you can tell if there’s a high spot or it’s not quite bent right.

The secret is to creep up on it slowly. You can’t bend too much, too fast. So you kind of hit it a little bit and get a little bit of a bend. Then you start working it back and forth. It’s like

rolling dough. If you try to hurry it and hit it real hard, you’re all done. It’s better to keep ding-ding-ding-ding-ding-ding. It should bend evenly. If it doesn’t, tough luck. You know, there’s no unbending—only bending.

If something turns out wrong, you have to start with a new piece. That didn’t happen with these. Lucky! It depends on the tolerances, a lot of times. I always tell the designers, ‘the bigger the tolerance, the better. If you make it too tight, we might be doing a lot of them.’

I’ve been at WHOI close to 10 years now, as a fabricator and welder, on different projects. I’ve been doing this since I was 21. I like to build things that are one-of-a-kind.

This project has been pretty interesting. What I like is the different personalities. We have every mix of character. Each person adds their little bit. Everybody says a lot about the new technology, but you know, it’s a lot more tricky with the innovative personalities mixed with the technology. Most people wouldn’t realize what it takes to do something like the *Alvin* project—all the different people that have to work at it. Everybody thinks it’s just somebody with a Ph.D. ▲



Tom Kleindinst/WHOI