

Water

Boeing employees work in world's largest indoor swimming pool supporting the International Space Station. By Adam Morgan

Matt King, Systems engineer on Boeing's International Space Station program, ate his bowl of cereal just like any other morning. But unlike most days, King would not be putting on his slacks, button-down shirt and tie. Nor would he later be sitting at his desk performing procedure reviews in support of NASA, or any of his other tasks related to the day-to-day operations of the International Space Station.

Instead, King donned swimming trunks and loaded about 50 pounds (23 kilograms) of scuba [self-contained underwater breathing apparatus] gear to his back. Then he jumped into the world's largest indoor swimming pool.


He is one of three Boeing employees qualified to dive with NASA in its Boeing-designed Neutral Buoyancy Laboratory. The facility provides controlled neutral buoyancy operations

to simulate the zero-g, or weightless, condition that is experienced by spacecraft and crew during spaceflight. For astronauts, the facility provides important preflight training for spacewalks: Large, neutrally buoyant items have an equal tendency to float or sink and can be easily manipulated, much like in orbit.

On this morning, King was trying to find possible solutions for an access issue recently encountered on the space station. One to three times a month, on average, Boeing employees dive into the lab at NASA's Sonny Carter Training facility in Houston. There they work with NASA providing mission, training and design support, input on on-orbit hardware construction, and other tasks as part of Boeing's space station support contract. When not getting wet, the Boeing employees travel to the facility several times a week to support NASA spacewalk training.

NASA's Neutral Buoyancy Lab,

which was designed by Boeing, is recognized as the largest indoor pool in the world. It measures 202 feet (62 meters) long, 102 feet (31 meters) wide and 40 feet (12 meters) deep, half above ground level and half below. It holds 6.2 million gallons (23.5 million liters) of water. Even at this size, a full-size space station mock-up must be configured differently to fit into the pool. Often, the International Space Station configuration is changed to fit training needs.



“Many times,” King said, “we’ll play an active role in the dives where we’re down there right in the middle of the action looking for solutions to problems or finding a better way to install hardware. Sometimes our role is more passive, where we are observing what the astronauts are doing, and we look for issues that might arise on orbit. The majority of the time we are observing, but those observations often can lead to improvements in processes or opportunities to dive at a later date, so they are very important.” Boeing is the prime contractor to NASA for the space station. In addition to designing and building all the major U.S. elements, Boeing also is responsible for ensuring the successful integration of any new hardware and software, including components from international partners, as well as for providing sustaining engineering work.

To be considered for one of Boeing’s diving positions,

employees must first obtain their scuba certifications from a nationally recognized organization. The diver then must pass a NASA physical along with the space agency’s own buoyancy lab certification, which includes showing proficiency in tasks specific to the lab.

“The diving environment in the [Neutral Buoyancy Lab] is quite a bit different than the typical open-water scuba diving,” said Juan Reyes, Systems engineer for Boeing’s space station program. “We are diving around a lot of equipment, so there is a great potential for you or your gear to get snagged.”

“When I first started with Boeing as an intern in 2004, I never imagined that part of my job description would be diving with astronauts,” King said. ■

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PHOTO: Matt King (left) and Juan Reyes join NASA divers in the Neutral Buoyancy Laboratory in Houston. The two Boeing employees are pictured with full-size mock-ups of the International Space Station in the background, including the ISS truss structure, which is the “backbone” of the station. NASA