ZEROG
A HELPING ARM

Inset: **Joe Thomas**, a grinder working on the *Ralph Johnson* (DDG 114) sonar dome, uses the Equipois zeroG Arm to demonstrate how it helps ease his work. John Forte, project manager with the office of Naval Research, demonstrated the new technology to several engineers and craft leaders.

By Shane Scara/Photos by Andrew Young

A cyborg's body never tires. While people combined with robots are mostly science fiction, a new device is helping people and their tools work together more efficiently and with less strain on human bodies.

During the last quarter of 2014, **Perry Haymon**, manager, Advanced Capabilities Group, set up demonstrations showcasing the zeroG by Equipois.

"The zeroG, or zero gravity arm, can render tools and parts weighing up to 36 pounds weightless, holding them in a position near the work they are conducting," said Haymon. "This can allow craftsmen to work with their tools horizontally or even overhead without strain."

Haymon said the device was introduced to the shipyard through the Sonar Dome Manufacturing Technology (ManTech) project, led by naval architect **Dianna Genton** with Process Engineering. The ManTech project is a joint effort between Ingalls and the Navy Metalworking Center (NMC), funded by the Office of Naval Research (ONR).

Shipbuilders working on sonar domes, including foreman **Bill Davis**, traveled to the NMC in Pennsylvania to conduct prototype testing prior to bringing the technology to the yard. Davis was instrumental in configuring the technology with a magnetic mount for use on the dome.

"A tool like this can help us quite a bit," Davis said. "Because of the shape of the dome, the operator is in a very awkward position for hours, days, even weeks. Even though a grinder is not very heavy, if you hold that tool up for an hour it feels extremely heavy. So the zeroG is very helpful. This device will actually hold the weight of your arm plus the grinder. It's tremendous."

Haymon said the tests showed zeroG improved work output by 30 percent, and the employee who used it was less fatigued at the end of the day.

"This has great implications for reducing workers compensation and for returning injured employees to work quicker," said Haymon. "If an injured employee isn't permitted to lift a certain weight, now the zeroG does it for him."

Haymon and his team will approach the ONR for funds to buy a few zeroGs for use at various locations in the shipyard. He said that craftsmen and women are already asking about applications for their crafts.

"Once we get the technology out there, the craftsmen will be our biggest assets of how to best use the technology," said Haymon.

Shipyard of the Future and Process Excellence are looking at several technologies to improve manufacturing output and ergonomic comfort for employees. Along with zeroG, they are also experimenting with applications for additive manufacturing (3D printing) and a portable plasma arc gouger.

Doug Blethen, manager of Process Excellence, said that the partnership with the Navy is making the future of the shipyard a reality.

"Working harder isn't going to get us where we want to be," said Blethen. "We have to take time to find something that makes the job easier."