

US Marines Deploy Advanced Waterjet Technology for Rapid Response Repair



Focused on rapid response since its founding, the U.S. Marine Corps has deployed Marine Expeditionary Units to trouble spots around the world for more than 200 years. The Corps' flexibility depends on its support operations, including such services as in-theater repair and fabrication units that provide immediate machining and welding capability. In line with trends toward increased speed and efficiency, the Marines recently added advanced OMAX® abrasive waterjet technology to its on-site metalworking capabilities.

The Marines' first in-theater use of deployable waterjet technology took place in Camp Leatherneck in Helmand Province, Afghanistan, during the troop surge in Afghanistan. The machine sent to the USMC base was an OMAX Mobile Jet/Machining® Center, a portable

system ideal for applications in mining, oil exploration, large ships and even high-rise construction. According to Gunnery Sergeant Charles Thompson, who supervised the repair and fabrication unit when the OMAX machine arrived at Camp Leatherneck, the idea to deploy waterjet technology to the war zone arose during the development of deployable CNC lathes and mills.

The shop Thompson ran at Camp Lejeune prior to deployment to Afghanistan had a waterjet machine, and according to him "some of the guys came up with the idea of a deployable waterjet. Like a CNC lathe, the waterjet is not inherently mobile, but obviously you can do it. The waterjet we used in Afghanistan was almost a proof-of-concept kind of thing." The idea, he said, was to "provide as much flexibility as possible in machining and fabrication to give combat commanders more options on what can be done. That became a huge force multiplier for us."

Engineered to be quickly and easily moved, the OMAX Jet/Machining Center Model 2652 sent overseas was mounted on an epoxy-coated platform featuring lifting eyes, tie-down rings and flooring consisting of rubberized, non-skid, antifungal material. The system is transportable in a standard shipping container.

The machine proved to be extremely useful. "I could run it 24 hours a day," Thompson said, "because as you go through combat operations, equipment breaks. And, the waterjet gave us a lot of flexibility logistically to fabricate parts right there, in-theater 10 miles from where they would be used. The machine saved a lot of time and repair costs." The machine's flexibility helped coalition forces



counter ongoing changes in enemy tactics. When combat commanders needed different tools to overcome new threats, "They were able to come in and talk to us about what they'd like to do. We would design something on the spot, cut it and give it back to them within an hour," Thompson said. "They would test it and come back and say 'We want 200 of them' or 'Hey, tweak this, and then give us 200 of them.' Because we had almost unlimited fabrication capability with our waterjet, CNC machines and mobile welding shop, we were able to change almost as fast as the enemy. The Intelli-MAX® Software Suite on the OMAX machine automates most of the programming and tool setup work, which made it extremely easy for my guys to use. They literally could have a prototype done within hours."

As troops rotated in and out of the war zone, time for training in machine operation was minimal or non-existent. Gunnery Sergeant Anthony Lashley followed Thompson in command of the welding and fabrication unit at Camp Leatherneck. Although he was very familiar with manual and CNC lathes and mills, Lashley had no prior



experience with waterjet machining. "I had no official training, and had a lot of reservations about it," he said. However, he "learned on the job, in just a few days." Regarding programming, he said, "In a week, I had it down. I found it to be one of the easier machines to use. You don't have to put in any code. Once you get the dimensions, what you draw is what it is going to be cut."

According to Thompson, the isolation of the combat zone presented a challenge like no other. "Afghanistan is far away from everything. I think the only place farther we could have gone is the moon. You can't just order something on Amazon and it shows up. It must go through some pretty unstable places, and there is no infrastructure. The only thing I think we could have done better when introducing the waterjet was prepping for the supplies for the machine, such as repair parts and the like." However, he said, "When we did have a problem with the machine, OMAX flew a guy over." Although the service technician's trip to the base was difficult, Thompson said, "He was still a pro once he arrived. In 10 days, the technician taught the person running the machine more than he probably learned the entire time before."



Thompson said the support was critical to the effort's success. "The business relationship we have with OMAX is so easy because they are affable to our crazy demands," he said. "We didn't know what we were doing, we didn't have training, we were learning on our own. Being able to call OMAX at any time and ask questions or get help was essential to our productivity and success. They've always been very good to us. They are a U.S. company; we wouldn't have used them if they weren't."

As part of the drawdown, the mobile machine was sent back to the United States where it continues its active duty at the Marines' Camp Pendleton. Thompson concluded saying that "right until the time Lashley and his guys boxed the machine up and sent it home from Afghanistan that thing was running and making us parts fast."

UNITED STATES MARINE CORPS

LOCATION: Camp Pendleton

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