

NAVY SBIR TRANSITION PROGRAM

SPOTLIGHT

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Winning Solutions: Hy-Tek Manufacturing Leverages SBIR to Evolve its Game-Changing Hardware Line of Products for the U.S. Navy and Others

By Julie Scuderi

Hy-Tek Manufacturing Co. (HMC) is all about problem solving. In fact, its highly skilled team of machinists and engineers prides itself on finding novel solutions for critical issues. Whether it entails performing a detailed engineering analysis of the problem or speaking directly with users to better understand their needs, HMC delivers thorough, new solutions to its government and commercial clients.

Take for instance one of its recent transitions via the Small Business Innovation Research (SBIR) program. The Navy had put out a solicitation to design a high reliable roller bearing for helicopter bay doors found on the Early Bird DDG class of destroyer ships.

These destroyers have two bays where mission helicopters are stored. The availability of these helicopters is crucial; therefore, so is their protection from elements such as salt water, high winds, and other environmental factors. A 10,000-pound bay door provides this protection and must open and close easily to facilitate missions whenever the helicopters are needed.

Unfortunately, these doors were not



Photo courtesy of U.S. Navy.

Hy-Tek's easily and rapidly installed Enhanced Clamp Cushion results in safer Navy missions including those on the FA-18 Hornet (pictured) by providing excellent line clamping performance without succumbing to UV, ozone, or material strain damage.

performing optimally. In fact, they would often get jammed or stuck because of bearings that were flawed by design. These bearings would easily get cracked or destroyed (sometimes after just two to three uses), interfering in mission-critical tasks and resulting in extensive time and money used to repeatedly replace them.

HMC, a full-service machine shop and production facility focused on construction, mining, agriculture and defense, won the Phase I award through the Naval Sea Systems Command (NAVSEA). Right away, the Navy technical point of contact (TPOC) sent HMC an

existing bearing that had been destroyed. The team quickly identified a design flaw and proposed a solution. They selected a new more durable material and completely redesigned the bearing during the Phase I portion of the project. Wanting to see more, the Navy awarded them a Phase II and the company's High-Load Roller Bearing (HLRB) was deployed on a Navy ship for six months, where its longevity was demonstrated; the HLRB was still intact after the six-month mission. After that, Phase III dollars started rolling in and the Navy has continued to purchase the HLRB for the last two and a half years.

“SBIR was really a great opportunity for us,” says John Jude, vice president of engineering at Hy-Tek Manufacturing Co. “The Department of Defense puts out a solicitation that basically says, ‘We have a problem and it needs to be fixed. There’s no existing solution; can you conceive it? And design it? And prototype and test it to meet our needs?’ So that was very interesting and fun for us to get into. The ideas we came up with were received very warmly by the Navy, Army and Air Force.”

In a subsequent SBIR effort, HMC continued its problem-solving mission

by developing Ultra Violet and Ozone Resistant Material for Hydraulic Clamp Cushions.

HMC's Enhanced Clamp Cushion (ECC) was designed to be a direct replacement for currently deployed Navy Aircraft line clamps that have relatively short in-service longevity. The easily and rapidly installed ECC provides excellent line clamping performance without succumbing to

UV, ozone, or material strain damage. This results in safer missions where lives are on the line. Hydraulic, fuel, and electrical line clamp integrity is paramount to aircraft flight safety and mission success. In

particular, clamp loop and cushion failure can result in line abrasion and fatigue that jeopardizes normal aircraft operation and crew safety. The target platform for the ECC is the F/A-18 Hornet and EA-18 Growler.

“Our approach was two-pronged,” explains Keane Hensley, senior mechanical engineer at Hy-Tek Manufacturing Co. “We addressed the material and the design of the clamp. We enhanced the elastomer to make it resistant to degradation but also to thermal stress



Photo courtesy of U.S. Navy.
A Navy MH-60H Seahawk helicopter is deployed from onboard an Arleigh Burke-class destroyer (DDG-80). Access to these helicopters is essential to Navy missions; Hy-Tek's High-Load Roller Bearing for bay doors eliminate jamming and other issues.

and chemical exposure. The other aspect is its unique Mohawk design which still maintains the grip on the cushion. The result is a clamp cushion that does not get destroyed and has at least five-time longevity over the others.”

With the award of a Phase II SBIR by the Naval Air Systems Command (NAVAIR) to further evolve the ECC, HMC joined the Navy SBIR/STTR Transition Program (Navy STP) where it had the opportunity to showcase its technology to a wider audience.

“The Navy STP has been fantastic for us, including the opportunity to work with our business consultants,” says Jude. “I don’t think there’s any other service that has the amount of outreach that the Navy has with STP. You gain a wealth of information: not only how to sell these products to the Navy, but also how to sell them to other agencies, and other divisions within the government. The honesty we’ve gotten too has been great. Both of our business consultants told us to go after the private sector as soon as we can.”

Tackling the private sector was no sweat for HMC: Before getting into SBIR in 2005, HMC was a well-known small business supplying machined components, assemblies, and engineering services solutions to companies including John Deere and CAT. But the founders of the company knew it could also help fill critical government needs, and so they began responding to SBIR solicitations and

learned as they went through the sometimes arduous process.

“It was very challenging for the first eight months; we didn’t win a thing,” recalls Jude. “But what we did do was continually ask for feedback and debriefs from the TPOCs, and each time, we said, ‘OK, we’re getting closer.’ We could call the TPOC whose name and number appeared on the solicitation and we’d have a conversation with him; we’d ask him to tell us more about what he needs. It probably took two years, but we finally received our first Phase I award.”

Fast forward to today, and Hy-Tek Manufacturing Co. is skilled in garnering SBIR funds the team uses to propel its technology—even on the commercial side—where the company is bringing in over \$10 million a year in revenue.

“SBIR has helped us in the commercial side of things as well,” says Jude. “It’s actually made us very confident in working with our large corporate clients; they may come to us with a drawing wanting a solution, and we’re able to say, ‘Hey this doesn’t make sense. This is what you need instead.’ Our eye for detail has certainly widened thanks to SBIR.”

For more information, visit the company website at www.hytekmfg.com.

