TOPIC NUMBER:	**SBIR INVESTMENT:**	**PHASE III FUNDING:**
N03-190	$2,293,966	$71,882,496.37

HELICOPTER OPERATIONS AIRCREW/ CREW CHIEF TRAINER

BSC Partners LLC (formerly Binghamton Simulator Company Inc.) developed the Aircraft Virtual Environmental Trainer (AVET), an immersive reality trainer for the aircrew of the MH-60R/S.

BSC Partners LLC (Binghamton Simulator Company Inc.)

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THE CHALLENGE

Traditionally, helicopter aircrew primarily received advanced skill training during in-flight missions. While this training and methodology may provide an experience that feels close to live-battle situations, it is costly and dangerous. Live exercises require dedicated training sites, fixed locations, specialized equipment, and logistical prep work. Helicopter aircrews throughout the military perform varied but similar tasks. Live exercises could be augmented or replaced with a simulator that enables maximum flexibility with tactile actions.

THE TECHNOLOGY

BSC Partners LLC (formerly Binghamton Simulator Company Inc.) developed the Aircraft Virtual Environmental Trainer (AVET). The AVET provides each student with a headset to view images instead of the typical large visual screen as seen as part of other H-60 trainers. A helmet-mounted display (HDM) visual system fixes directly to the student's helmet, providing a 360-degree visual of the aircraft's interior and exterior. The AVET HMDs supply an immersive environment for the student and removes the need for larger projection systems. This stand-alone reconfigurable full-motion simulator supports training in aerial gunnery, search and rescue, cargo replenishment, confined area landings, and emergency procedures for the MH-60R Seahawk and MH-60S Knighthawk aircrews. The AVET simulates three aircrew stations: aerial gunnery operations, hoist operations and cargo operations; it also replicates two aircraft configurations, two rear doors, two rear windows with simulated weapons, and one cargo hatch door with a cargo hook.

THE TRANSITION

BSC was awarded an SBIR Phase I award under topic N03-190 to develop immersive reality training technologies for the Navy. During Phase II, NAVAIR selected two companies to worked together to continue to develop the technology.

BSC filled the prime contractor role in producing a prototype AVET, known as the PAVET. Systems Technology Incorporated (STI), as a subcontractor to BSC, developed a fused-reality visual system concept environment. BSC collaborated with experts from the Naval Aviation Training Systems and Ranges program (PMA-205) and Naval Air Warfare Center, Training Systems Division in designing and creating a prototype that was sent to the fleet for evaluation. The first AVET was delivered to the Naval Air Station, North Island in San Diego in 2011. In 2014, BSC was acquired by Kratos Defense and Security Solutions, Inc. which continues to produce and modernize the AVET, as well as the MH-60R Naval Aircrew Training System (NATS).

THE NAVAL BENEFIT

Simulator training, such as the AVET, allows the introduction of scenarios that may be too dangerous to include in live training exercises. This leads to more comprehensive training and improves fleet readiness. Aircrew training using AVET and similar platforms can be completed in a shorter amount of time compared to live exercises. Simulator technologies are flexible and can be easily customized for certain situations and tasks. With modification, AVET can be easily adapted to other aircraft platforms. Additionally, simulator training provides significant cost savings over live training on aircraft, as using aircraft may cost thousands of dollars per training hour.

THE FUTURE

The AVET is used to support instructional training at the Fleet Replacement Squadron (FRS). Additionally, operational squadrons and Sea Combat Weapons School use the training technology to enhance proficiency in assigned aircraft tasks and to train advanced tactics. The AVET is paving the way for the next generation of immersive technologies, such as mixed reality—the merging of real and virtual worlds to produce visualization and new environments where physical and digital objects coexist in real time. These immersive technologies are used for training across all branches of the DoD, as well as in commercial applications.

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