NEXT-GEN TRAINING

New Simulators Allow for Portability, Ease of Use

By **Gina Cavallaro**, Senior Staff Writer

The U.S. Army's decades-old training simulators are on their way out, to be replaced with a single holistic software system that will transform virtual training for soldiers anywhere in the world.

While the most visible Army modernization effort is in development of next-generation hardware, the overhaul of simulated training will be the linchpin to readiness, providing soldiers and leaders with options for maintaining proficiency through repetition, even on the battlefield.

Current training simulators have been updated, upgraded and refined over time, but they are beset by limitations as simple as being confined to fixed structures on Army installations, and as complex as requiring multiple software packages to simulate an operational environment. The diverse simulators also require teams of contractors to maintain systems that can't even share data or simulate cyber and space environments.

Brig. Gen. William Glaser, director of the U.S. Army Futures Command's Synthetic Training Environment Cross-Functional Team, said the big difference in the Army's new simulators will be in the software. He described development of the synthetic training environment (STE) as being "in a very good place," adding that while the system is designed to have software and hardware components, "the software is critically important to drive everything."

"This idea that we're going to have one single holistic environment driven by one set of software underneath a massive architecture is hugely important, and we've seen some significant improvements and successes," Glaser said.

Constant Adjustment

That software architecture is being built under constant refinement with the help of software engineers whose adjustments respond, at least in part, to input from soldiers who test and provide feedback on the programs.

Creating the STE's foundation is on

track, Glaser said, but he cautioned that it won't be possible to field the entire system at once.

The first new training program, the Reconfigurable Virtual Collective Trainer and its underlying software, is slated for an operational demonstration in the spring of 2024 at Fort Cavazos, Texas.

The Reconfigurable Virtual Collective Trainer will replace two simulators: the Close Combat Tactical Trainer for mounted crew members in Abrams tanks and Bradley Fighting Vehicles, and the Aviation Combined Arms Tactical Trainer. Each legacy simulator was fielded more than two decades ago.

In addition to tanks and Bradleys, the combined simulator will integrate Stryker and all wheeled vehicles, dismounts, rotary aircraft and unmanned aerial vehicles for simultaneous operations.

Depending on the outcome of the test, fielding will begin with units at Fort Cavazos by the end of 2024, Glaser said.

Three-Part System

The STE's foundation is a three-part information system that consists of training simulation software to run the training programs much as an engine that runs gaming programs; the Training Management Tool, an internet-based program that allows junior leaders to create their own training scenarios quickly; and the One World Terrain program, a single, high-fidelity, 3D terrain database that uses geopairing technology to create or recreate any terrain.

"One World Terrain is replacing 57 different constructive, virtual terrain formats," said Col. Scott Woodward, commander of the U.S. Army

Opposite: A soldier at Fort Cavazos, Texas, tests a ground platform simulator on the Reconfigurable Virtual Collective Trainer, one of the next-generation simulation systems being developed by the Army. **Above**: A warrant officer at Fort Cavazos uses heads-up display goggles on the trainer.

OPPOSITE: U.S. ARMY. ABOVE: U.S. ARMY/ARIANA AUBUCHON

Combined Arms Center-Training at Fort Leavenworth, Kansas, whose team works hand in glove with the Orlando, Florida-based cross-functional team on requirements and development of the programs.

The Army's legacy training simulators, he said, are stovepiped, meaning software that enables terrain scenarios is licensed property that cannot be shared from one simulator to the next. With STE, he said, "every exercise that we do —eventually live training—but all virtual, constructive training will be on One World Terrain database. That is huge for our Army."

The One World Terrain program has already been proven. In August 2021, the program provided leaders from the 82nd Airborne Division a 3D map of Hamid Karzai International Airport and the surrounding area during the U.S. military withdrawal from Afghanistan. "It's also been used in a number of other areas of operation," Glaser said, including Project Convergence 2022 at Fort Irwin, California.

"One World Terrain has probably been our most successful product that we've developed thus far, because it's being used not just in the training community, but within the operational community as well," Glaser said. "We build the terrain once and use it often in a variety of ways."

Game Changer

Under the category of "where the rubber meets the road," the Training Management Tool will be a game changer for training planners at the company and battalion levels, Glaser said.

Responding to an overarching requirement of the STE, which is ease of use, the Training Management Tool is set to eliminate the cumbersome, expensive and time-consuming process of relaying the intent of training scenarios to contractors, who then build them out. With STE, the data sets will be at soldiers' fingertips and as easy as point and click, Glaser said.

As an example, Glaser explained that because the database required to run simulations is complex, "just the ability to set up the task organization of blue [friendly] forces so it matches exactly what's in the company or battalion" can be time-consuming and technically challenging.

To eliminate this legacy process, Glaser said, the software that runs the Training Management Tool will be front-loaded with the Modified Table of Organization and Equipment of every unit down to the company level and available instantly on a drop-down menu.

"So, you would open it up, you would identify, 'Hey, I'm Alpha Company commander of 4th Battalion, 64th Armor Regiment, in the 2nd Brigade of the 3rd Infantry Division,' and instead of programming every person, every weapon system and every sensor, it would be able to pull that from an automated source and provide that initial database," Glaser said.

Also planned for the Training Management Tool's database are off-the-shelf training support packages that include scenarios, operational orders, opposing force options and graphics that company and battalion planners are now inputting manually.

The training support packages would be validated by commandants of the Army's respective branches such as infantry, armor and field artillery, and would include automated after-action review capabilities based on Army doctrine and field manuals.

Once the automated system is in use in the virtual environment at the company level, Glaser said, the expectation is that leaders will develop an understanding of and proficiency with the system that will make it easier to apply to squad- and individual-level training.

Planning training exercises with the internet-based Training Management Tool's drop-down menus, Woodward said, will take as little as 30 minutes, compared with the weeks it takes for a company or battalion commander to meet with a contractor at their installation's simulation center and convey all the tasks they plan to train.

"A company commander or platoon leader or battalion commander could do this from their office, they could do it from home, and [with a little practice] you could probably do one in under 30 minutes," Woodward said. Once the planned exercise is formulated, the next step is execution in a simulator.

"We'll be able, at some point, to integrate this with live training exercises and, as we look farther down the road, to the future next-generation constructive that will replace our warfighter exercises," Woodward said. "The sky's the limit on this."

Portable Capability

Executing training plans ushers in the capabilities of the Training Simulation Software, which is not yet tied into the Training Management Tool. In addition to the Reconfigurable Virtual Collective Trainer, several programs are taking shape to replace and consolidate the Army's legacy simulators.

Glaser and Woodward explained that these new simulators will be portable, so they can be used anywhere at the point of need rather than at an installation-based simulation center.

In Europe, for example, "once people move forward into their deployed locations [such as Poland], we don't have a significant level of training capability there, but that's when they have more time on their hands than any other time," Glaser said. "That's why we're pretty excited to be able to deliver this capability forward."

The Soldier Virtual Trainer will use high-definition video scenarios to combine three systems: Weapon Skill Development, which allows soldiers to use real individual and crew-served weapons with drop-in kits that can evaluate several marksmanship tasks; Joint Fires Training for joint fires observers and joint terminal attack controllers calling for close air support; and Use of Force for law enforcement soldiers. Expected to be fielded in 2025, the Soldier Virtual Trainer will still be used in a room or building, but it will be portable and used with a server and adjudication system.

Another new system, the Squad Immersive Virtual Trainer, slated for release in fiscal 2026, will use a heads-up display goggle with the ability to create a common operating picture. With the Squad Immersive Virtual Trainer, squads of dismounted soldiers can immerse themselves in a virtual reality environment and conduct collective tasks and battle drills on a multidomain battlefield.

Replacing the Multiple Integrated Laser Engagement System (MILES) will be a new program called the Live Training System, slated for release in fiscal 2026. The system will be upgraded to replicate effects of the modern battlefield. These will include indirect fire, counter defilade fire, placed and thrown objects such as grenades and claymore mines, and anti-aircraft weaponry.

For scalable division and corps training, the Synthetic Training Environment Cross-Functional Team is working on a program called NextGen Constructive to replace a 10-year-old program that is hard to update and cannot share data with other systems. The NextGen Constructive program aims to realistically portray the future environment with an open architecture that allows easy software updates and interaction with other applications, opportunities for repetition at scale and the capability to replicate a multidomain scenario. The program is slated for release in fiscal 2028. ★

Opposite: Brig. Gen. William Glaser, director of the Synthetic Training Environment Cross-Functional Team, speaks at the Association of the U.S. Army 2023 Global Force Symposium and Exposition in Huntsville, Alabama. **Above**: Pennsylvania National Guard aviators unpack Reconfigurable Virtual Collective Trainer-Aviation system components at a testing facility in Orlando, Florida.

OPPOSITE: U.S. ARMY/PATRICK HUNTER. ABOVE: U.S. ARMY/NATE SNOOK

From *ARMY* magazine, Volume 73, No. 9, September 2023.