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Sidebars

Commanders Want Realistic Simulations

by Sandra I. Erwin

At the core of the U.S. Army's efforts to prepare for non-conventional warfare—such as small-scale conflicts and regional flare-ups—is the idea that a soldier must see the enemy before the enemy sees him. And he must take action quickly, before the enemy can react.

The problem with trying to develop those combat skills is that the training capabilities available today are inadequate, said Col. Charles Randy Ball, project manager at the Army's Simulation Training and Instrumentation Command (STRICOM).

The training tools—such as command-post simulations—currently used to instruct commanders and staffs are not suited to prepare the type of leaders the Army wants in the future, Ball said. These simulations “will never allow them to execute that kind of doctrine,” he told reporters during a briefing at an Association of the U.S. Army's symposium in Ft. Lauderdale, Fla.

What the Army needs, Ball said, is a simulation “with enough detail, with enough fidelity to practice the way we are going to fight.”

That simulation is in development now, and it's called Warsim, said Ball. Warsim is the land component of a gigantic multi-service simulation program called JSIMS, or joint simulation.

Warsim could be available as early as 2004, but its future is tied to JSIMS, which has suffered delays and cost overruns since the program began in 1997. JSIMS is managed by a government team under the Defense Department's office of research and engineering.

Lockheed Martin Information Systems, in Orlando, Fla, became the Warsim prime contractor in 1996. Subcontractors include SAIC, Logicon, Computer Associates, Dynamics Research Corp. and Veridian.

All Levels of Conflict

What makes Warsim valuable to the Army is that it allows brigade, division, corps and joint commanders to train for all levels of conflict, from major theater wars to peacekeeping and operations in support of international

uneater wars, to peacekeeping and operations in support of international coalitions, explained Debra Palmer, program manager at Lockheed Martin. "They can train more realistically," she said, because Warsim can adapt to all types of environments and terrains.

In peacekeeping and support operations, she added, "you have complex relationships, non-traditional players and coalition forces."

If this program works as promised, it would allow joint commanders to conduct after-action reviews based on the actions by all services, not just the Army, Palmer said. Currently, there is no "common view of the battlefield," she said. "JSIMS would provide that."

Each service would build its own models, but there are some common pieces that all services would need to standardize, such as look-and-feel, user interface, simulation engine and scenario generation capabilities.

"Everything we do in Warsim is integrally tied to JSIMS," said Ball. "We are completely dependent on them for key parts of what makes Warsim work. It's important that we are in lockstep with JSIMS."

Lockheed Martin is developing a synthetic natural environment, a user interface and a tactical intelligence module for all services, said Palmer. The intelligence module makes it possible for the simulation players to receive data from eight intelligence systems, as well as a host of tactical sensor platforms.

"The key component of our doctrine, the Joint Vision 2020, relies on information superiority," Ball explained. "That cannot be realized without the entire [intelligence, surveillance and reconnaissance] ISR systems inventory in place, at the theater and tactical level."

The ability to rehearse missions on short-notice is going to be "one of the most powerful applications" of Warsim, Palmer said.

STRICOM, meanwhile, sees Warsim as a launching pad for an ambitious plan to connect virtual, constructive and live simulations. Warsim is a constructive command-and-staff training simulation. A virtual simulation, for example, is the Army's close-combat tactical trainer (CCTT), used by tank gunnery forces. Live simulations are range exercises, such as those conducted at the National Training Center, in the California desert.

The goal, said Ball, is to link constructive and virtual simulations, and, ultimately, tie them to a live simulation. "That's our long-term vision."

Joint battle-command training today requires an assembly of about nine models from different services, said Ball, which are "difficult to link to virtual simulations."

JSIMS would provide a synthetic environment that is common to everyone,

he said. For the Army, specifically, the plan is to have a single synthetic environment connecting Warsim, CCTT and Onesaf (one semi-automated force), which is an entity-level simulation generating the backdrop for a virtual simulation.

Ball said the Army currently has three major systems for command training at the division-and-above levels. They all will neck down into Warsim. For brigade-and-below levels, there are four major systems used to train digitized forces at Fort Hood and Fort Lewis. Those will be replaced in 2005 by Onesaf, said Ball.

Onesaf models the physical behavior of every person, tank and round of ammunition on the battlefield, he said. "We are going to have a link between Warsim and Onesaf."

Both Warsim and Onesaf eventually will be installed at all Army schoolhouses. But Ball cautioned that this system does not support the strategic-level war games that typically are conducted at the Army War College. Warsim helps commanders prepare for war. At the War College, the simulations are designed to help national leaders decide whether to go to war at all.

To improve its virtual simulations, STRICOM is funding a project at the Institute for Creative Technologies, in Marina del Rey, Calif. "It's a partnership between STRICOM and the entertainment community to see how we can make our simulation training more realistic," said Ball. "We can take huge advantage of the 'dollar-leverage' that the entertainment industry has."

The Halodeck

James Korris, director of the institute, said he is working on "high-end three-dimensional graphics for mission rehearsal." By the end of this decade, "I think we will be able to demonstrate something very close to the holodeck," he told the Army conference in Fort Lauderdale. The holodeck is the simulation lab popularized by the 1990s TV show "Star Trek, The Next Generation."

Experts from the entertainment and gaming industries have been hired for this effort, Korris said. The work is focusing on developing digital scenarios for the Army's next-generation combat vehicle, called FCS (future combat system). "We are looking 15 years into the future," said Korris. These virtual simulations require large displays, with 150-degree field-of-view, typically used for high-end research work in molecular analysis, spacecraft and automobile design.

The next step is to develop games and game consoles, said Korris. The institute plans to create a training simulation, derived from a Sony Playstation 2 game, which would model the way people interact with robots and sensors.

The human-machine interface for the FCS will have dramatic implications for

The human-machine interface for the FCS will have dramatic implications for soldier training, said Barbara A. Black, human factors expert at the U.S. Army Research Institute. The use of "robotic shooters" is a new concept in the Army, she said. For the reason, the service needs to figure out how soldiers will be trained to fight with these new systems. The next generation of technology, said Black, "will not solve the human problem of training and leadership development."