INFANTRY NEWS

THE OBJECTIVE FORCE WARRIOR (OFW) Science and Technology (S&T) program got under way recently when two companies were selected as lead technology integrators (LTIs) for the concept development phase.

OFW is an Army flagship program that is focused on providing the future soldier and small team similar combat-overmatch and skip-a-generation capabilities that future combat systems bring to the Objective Force.

The OFW program seeks dramatic improvements in individual soldier lethality, survivability, and agility, while reducing combat loads from 100 pounds today to less than 50 pounds by 2008. The OFW applies system of systems solutions in concepts, designs, and technology demonstrations that are available only in platforms today. The OFW S&T program seeks to demonstrate technologies for lightweight protective combat ensembles with integrated multi-function sensors, networked communications, collaborative situational awareness, enhanced positioning navigation, networked fires, collaborative embedded training, medical status monitoring, and unmanned air and ground sub-systems.

The OFW S&T program will be conducted in two phases. In Phase I, the two competing LTI teams will work closely with the Army to develop the OFW concept design and system of systems architecture. In Phase II, the Army will down-select to a single team that will complete preliminary and detailed OFW designs. Then it will integrate component technologies and subsystems into the OFW system of systems. This LTI approach in the S&T phase of the OFW program seeks to develop technologies faster and to a higher level of maturity in S&T to shorten the time needed in the System Development and Demonstration phase. This phase will reduce the total time needed to develop, test, and field OFW by the end of this decade.

For more information contact Major Amy Hannah at Army Public Affairs at 703-697-4314; Jerry Whitaker at U.S. Army Soldier Systems Center, 508-233-5340/5945; or access the OFW Web site:http://www.natick.army.mil/soldierwsit/index.htm.

NATIONAL GUARD ARMORIES throughout the country have suffered from a severe shortage of unheated storage space. When guardsmen are not mobilized, their supplies must be stored—from tents, fatigues, sleeping bags, and medical equipment to trucks, tires, petroleum, oil, and lubricants.

Ten years ago, the New Jersey National Guard (NJNG) began renting metal cargo containers, but these flat-roofed containers had serious drawbacks. With no ventilation and no drainage, the containers began to rust out, and the materials in them were water damaged.

To save supplies and equipment from further damage, the NJNG decided to expand unheated storage space immediately, but also to see that the solution was lasting and affordable. Investigation determined that prefabricated buildings with structure, sheeting, and rigid insulation pre-installed in modular panels offered the best combination of speed, function, value, and expandability.

A contract was let for 25 buildings across the state in a first round of construction. The contractor turned to a manufacturer for pre-engineered metal buildings that assemble "out of the box" at one-third the cost of brick and mortar structures. The manufacturer sent a representative to train the construction team and oversee quality control on the first building they erected.

At each site, one team leveled the ground and poured a concrete foundation, while another team bolted building sections together, stood them up, and fastened them together as soon as the concrete was dry. The erection of the 30x30-foot buildings took just four days per site, thanks to the structure, sheeting, and insulation pre-installed in modular panels, along with doors, windows, and ventilation.

Compared to brick and mortar, the pre-engineered buildings saved about $50,000 per building in labor costs. Each pre-hung door alone may have saved a day's labor at each site, and pre-set anchor bolts for the foundation may have saved another two days.

The NJNG estimates that it saved about seven months in start-to-finish time, and at least $10 million in equipment that would have been ruined if not stored in the old pre-engineered buildings.

For further information, visit www.kellyklosure.com .

FIBER OPTIC GYROS (FOGs) have been selected for two military turret stabilization applications. Turret stabilization is a large and growing market as military forces require greater accuracy and durability than is offered by existing mechanical gyros. There is great potential for FOGs within these applications, as both new equipment purchases and upgrades to gyros that are already in the field.

Under the terms of the first of two orders, single-axis gyros will be supplied for use in an upgrade of turrets aboard main battle tanks. The second order includes dual-axis gyros for integration within a new turret designed for use aboard armored combat vehicles. In each case, the onboard FOG will stabilize the gun turret while the vehicle is aiming and firing.

Gyros will enhance the capabilities of

mobile forces on the battlefield by combining accurate positioning, firepower stabilization, and hardware durability. With low purchase and maintenance costs, the long-lasting gyros can be installed both as new equipment and as form, fit, and function-ready upgrades for existing, costly mechanical gyros.

THE INTEGRATED UNIT SIMULATION System (IUSS) at the U.S. Army Soldier Systems Center will emerge, beginning this fall, with an innovative design that brings groundbreaking modeling and analysis capabilities to help the Army transform to the Objective Force.

The IUSS is a constructive force-on-force model for assessing the combat worth of systems and subsystems for both individual and small-unit dismounted warriors in high-resolution combat operations.

For more than a decade, analysts have used this system, which has a computer-based software that offers the primary ability to model lethality and survivability, and a more limited ability to model command, control, and communications; mobility; sustainability; and military operations in urban terrain (MOUT). It is acknowledged as the optimal tool for highly detailed research, development, and acquisition analyses of individual warrior systems.

IUSS will soon boast advanced cognitive models that will allow computer-generated forces to behave more like real soldiers—within combat vignettes developed by the analyst. They will move, shoot, and communicate more independently than ever before. They will also sense their environment, drawing critical cues from visual and auditory algorithms, and then make decisions based on their perceived ground truth.

Current combat simulations have to be scripted for the most part. Analysts predetermine the path computer-generated forces must take to their objective and "hardwire" certain tasks to be performed along the way. The new IUSS will enable the forces to operate autonomously and choose their path and actions based on a dynamic battlefield.

FUTURE WARRIOR SYSTEMS include heads-up displays, global positioning systems, combat identification sensors, chemical detectors, electronically controlled weapons and physiological status monitors connected to the warfighter's computer for instant information access.

A manufacturing technology program at the U.S. Army Soldier Systems Center (Natick) is exploring ways to integrate electric wires and fiber optics into textile materials that will enable future warfighters to use sophisticated battlefield capabilities without the current weight and bulk.

Cooperation between Natick Soldier Center's Individual Protection Directorate and the Objective Force Warrior Technology Program Office, Communications and Electronics Command at Fort Monmouth, N.J., and several other military, academic, and industrial groups are involved with various textile-based projects to make it possible.

One option to eliminate the antenna that troops now carry is a multi-frequency antenna vest. The antenna will provide coverage in the 30-500 MHz and 300-2,000 MHz frequencies, using an ultra-wideband antenna with no visual signature.

Similarly, a prototype to replace the antenna for the low-frequency band SINCGARS radio was built into a fabric vest. Manufacturing technology examined the fabrication and feasibility of building transmission lines and radiation elements for the wearable textile-based antenna.

The existing round plug-ins for the cables on the Land Warrior's computer are bulky, costly, and prone to failure because of the fragile pin-and-socket connection. Natick is working to upgrade the network cables and manufacture a flat, pinless connector with recessed contacts.

One way of removing external wires and creating a more distributed network of sensors and electronics is to weave the wires right into the fabric. A laboratory in Philadelphia has a contract to develop manufacturing processes for integrating optical fibers and traditional wires into woven and knitted textiles. With these technologies, conductors and optical-electronic systems could be woven into soldier's uniforms during large-scale manufacturing.

Another way of incorporating electrical networks into soldier clothing is through stitchless seam technologies that were first developed by Clemson University with prior Natick Mantech funds. The technique entraps fiber optics and conductors either on top of the fabric or along the seams. Clemson Apparel Research is investigating combinations of wires to form the electrical characteristics of commercial cables, available connectors, and garment-to-garment and undergarment-to-garment mechanisms.

Clemson is considering the specific network needed for Land Warrior laser sensors on the helmet cover and a general network for the battle dress uniform (BDU) top. The first samples of fabric containing electrical wires and a helmet cover network have been provided.

In a move to eliminate bulky and heavy gear, such as Land Warrior's soldier control unit, a laboratory in the United Kingdom has been contracted to develop a soft switch fabric with the sensitivity to be operational on the sleeve of a BDU and seamless incorporation into the garment.

One goal is to produce a keypad on the sleeve that can interface as the soldier control unit with specific military functions. Another goal is a textile data bus (a set of conductors) and the necessary connectivity to transport the signal from the keyboard to the control electronics.

For more information about the Army Soldier and Biological Chemical Command or the Soldier Systems Center, please visit our web site at http://www.sbccom.army.mil.