THE WARRIOR

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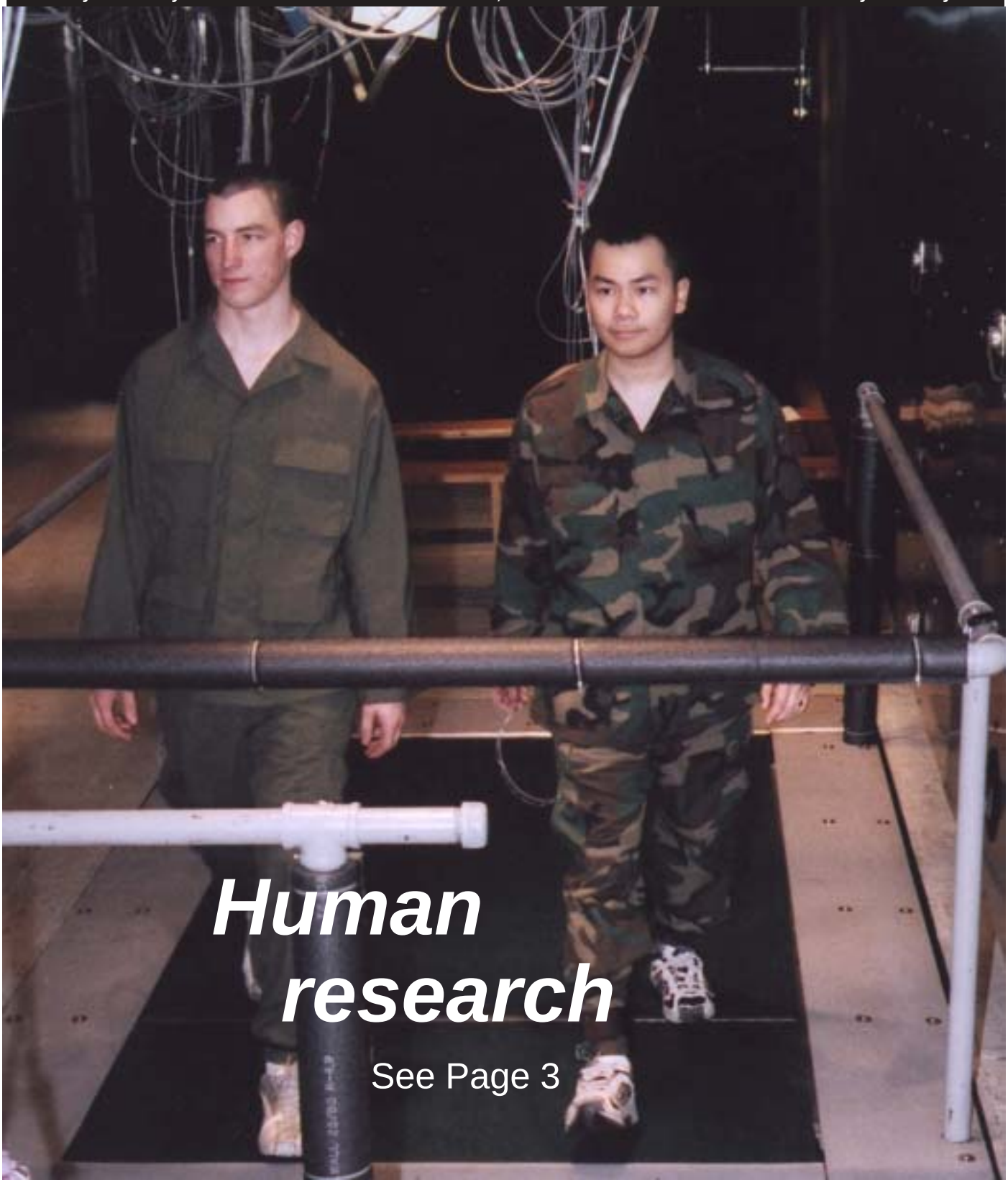

Human research

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Cover photo: Human research volunteers Pfc. Justin Gentry and Pfc. Phoung Ngo participate in a day of testing in the Climatic Chambers. (Warrior/Biberdorf)

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U.S. Army Soldier Systems Center

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Trial warriors

Soldiers find different way to serve as human research volunteers

By Curt Biberdorf
Editor

Sir Hubert Wilkins tested his own clothing prototypes for flame resistance by walking into a blazing gasoline fire. Brig. Gen. Georges Doriot recounted in a speech in 1967 how two Navy commanders volunteered to try out developmental body armor.

"One would get up, put the vest on, and the other one would take a revolver out and shoot at this fellow," Doriot said.

Such daringness of the pioneering researchers wouldn't be tried today. Instead, a steady flow of human research volunteers at the U.S. Army Soldier Systems Center in Natick, Mass., has become the backbone for testing everything that's worn, carried or consumed by warfighters.

They also test tasks that affect soldiers in the field to see what happens under actual conditions. Since 1954, about 3,700 soldiers have volunteered for this duty.

"They perform a unique and very important mission for the military," said Jane Simpson, manager of the human research volunteer program. "It's always important to have soldiers here because they're affecting the larger population of soldiers."

The soldiers have complete control to first become a part of the program, then participate in a particular study and finally stay on throughout the study. At any stage, they can change their minds.

"A volunteer is exactly that," said Ginny Thompson, manager of the Office of Research Quality and Compliance at the U.S. Army Research Institute of Environmental Medicine (USARIEM), an installation partner of the Soldier Systems Center. "It's probably the only time in the military they'll have control over everything. We go the full distance to ensure we have informed consent from each volunteer."

When "greater than minimal risk" is involved, the study goes before the human subjects review board, according to Thompson. Because they're considered a part of medical research, a body of federal regulations and laws ensure that the volunteers are protected.

If at any time the volunteer or researcher believes something is unsafe, the testing is stopped and changed.

"Of course we want the scientific data, but the well-being of the volunteer is our first concern," Thompson said.

"For most people, medical research is clinical trials if you're ill," Simpson said. "We're trying to understand the physiology of soldiers in battlefield conditions. Only healthy people to start can participate in military functions, so we need healthy human research volunteers."

The Army knew about the dangers of dehydration, but when soldiers at Fort Benning were harmed by drinking too much, studies conducted with the assistance of human

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Warrior/Biberdorf

Human research volunteers are often connected to several monitors to measure their physiological responses.

Warrior/Biberdorf

Spc. Julia Hodo, Spc. Jeremy Whitsitt and Pfc. Kemoathe Green walk on a treadmill at the Climatic Chambers, located at the Soldier Systems Center, while taking part in a study on clothing comfort. The facility is capable of simulating worldwide weather conditions and is used for studies on human performance and equipment testing.

research volunteers allowed physiologists to re-write fluid replacement guidelines.

Volunteers contributed to forming Army training aids for water discipline. Through laboratory and field studies, researchers re-wrote work intensity and water guidelines, and since 1999, the incidences of hyponatremia (low blood sodium) have been greatly reduced, said Dr. Margaret Kolka, a research physiologist with USARIEM's Thermal and Mountain Medicine Division.

It's one example of many where human volunteer research has benefited the military.

"We hope that these volunteers see that they are serving a greater good," Thompson said. "The soldier here is probably going to be influencing a lot more soldiers than by going directly to their first job assignment."

At any one time, USARIEM has about four studies in progress, but during their 90 to 179-day temporary duty assignment, the volunteers may participate in as many as five to 10 studies ranging from one day to as long as every day for a month.

Spc. George Ngugi, a personnel administration specialist, has participated in multiple studies and said he was intrigued at the opportunity because he wanted to push himself.

"If you feel like you can't do it, (the researchers) will coach you through it to make sure you're comfortable and can do it," Ngugi said.

As a new study is approved, the volunteers are briefed on it, sign a volunteer affidavit agreement and get a schedule. Studies take place primarily at various facilities at the Soldier Systems Center.

During a complicated study, as many as a dozen people are involved to monitor heart rate, blood pressure and other physiological indicators according to their area of expertise. Tests sometimes involve probes and needles. Nothing is left unchecked medically from pre-selection through testing itself.

"Every protocol details necessary medical screening. However, their health may change over time, and they're re-evaluated," Kolka said.

Warrior/Underhill

Pfc. Phoung Ngo takes a break in the Climatic Chambers locker room before a day of testing.

"These soldiers are as well screened medically as anybody in the Army."

After training to be a food service specialist, Spec. Heidi Maas volunteered to go to Natick and has enjoyed the experience. "I'm glad I came here and met who I've met. I feel like I've accomplished something in my military career," she said.

Ngugi also has a sense of achievement. "I feel like I've played a part in helping the researchers and think I've done something to help the Army," he said.

Human research volunteers help maintain the subject matter experts' basic research competency to enable them to proficiently evaluate groups of people when necessary, said Kolka.

They can influence Army doctrine. On the other hand, engineers designing new equipment get the feedback they need by arranging a much earlier human interaction with equipment in evaluation.

"Our first line of research is the human research volunteer," Kolka said. "If they don't volunteer, everything else breaks down."

Courtesy photo

Human research volunteers undergo a study with the Self-Contained Toxic Environment Protective Outfit in the Climatic Chambers.

Volunteer opportunities open to experienced soldiers

Opportunities are expanding for soldiers to become human research volunteers at the U.S. Army Soldier Systems Center in Natick, Mass.

With permission from the U.S. Army Personnel Command, soldiers are traditionally found during periodic recruiting trips to Fort Lee, Va.; Fort Jackson, S.C.; Fort Leonard Wood, Mo. and Fort Sam Houston, Texas, before they finish their Advanced Individual Training and move to their first permanent duty station.

"It's the least disruptive and best way to get a wide variety of soldiers," said Jane Simpson, manager of the human research volunteer program.

Now she is trying to grow the pool of potential volunteers by bringing experienced soldiers before they change permanent duty stations.

To be eligible, soldiers must be single, between 18-35 years old, and in good physical health with no prior heat, cold or orthopedic injuries.

Soldiers are assigned temporary duty for 90-179 days to the Soldier Systems Center Headquarters and Headquarters Detachment. When the volunteers are not participating in a study, they gain on-the-job training that matches their military job.

Sometimes a soldier can extend their stay, and if selected for one of the 10 permanent duty positions at the detachment, their assignment can last up to two years.

Combat arms troops are not actively recruited because there's nowhere to go to practice their trade.

"If on a PCS (Permanent Change of Station), we'll entertain that possibility," said Simpson. "We're picking people who can fit into the installation."

Squeezing into an exhausting training schedule, Simpson delivers a 30-minute presentation to an audience of nearly 200 on her recruiting trips. She briefly tells them about Natick, the mission at the Soldier Systems Center, describes the type of research and then specifically tells them about studies scheduled for the next three months.

Ideally, a small contingent will raise their hands. Upon further screening by drill sergeants and doctors, she narrows down the group to about 20 soldiers for the short-term assignment.

"I try to lay it on the line and be up front with them," Simpson said. "The most important word is that these soldiers are volunteers. It's not an oxymoron. They volunteer at every step of the process."

Major benefits of volunteering are living in the Boston area, a chance to get their hands on future military gear, and most important, making a contribution to the military mission.

"These kids often join the Army because they want to be challenged," she said. "This is the ultimate challenge, both mentally and physically."

—CB

Worship home

Containerized Chapel enhances base camp religious support

By Curt Biberdorf
Editor

Worship will be easier for soldiers and the civilians who serve them at base camps after the Containerized Chapel goes into production this year.

The first complete Containerized Chapel prototype was built last year at the U.S. Army Soldier Systems Center in Natick, Mass., and deployed in July to join a Force Provider base camp at Kandahar Air Base, Afghanistan.

Two more chapels first used in Kosovo in 1999 are set to deploy in support of Operation Enduring Freedom, and another chapel built at the Soldier Systems Center is waiting for the order to move out, according to Chap. (Capt.) John Wheatley, installation chaplain.

Eventually 40 of the portable chapels, developed by Product Manager-Force Sustainment Systems, will be positioned around the world and available for deployment for each Force Provider, the Army's deployable "tent city."

Many of them were initially the chapel component of Force Provider and are being refitted at an Army depot into stand-alone Containerized Chapels.

The idea came up after identifying unmet needs from past long-term stability and support missions in Haiti, Somalia, Bosnia, Albania and Macedonia. Religious support equipment was substandard and often incomplete, Wheatley said, and the chapel is a significant step up from the dining tents normally occupied for religious services.

"(The military) has been very good about supplying personnel. This confirms that the military is willing to put full research and development into the tools for religious support," Wheatley said. "It certainly allows many more options for the worship needs of all soldiers."

The Containerized Chapel is a package of equipment transported in a single steel ISO container that provides a multi-functional religious facility for a 550-person base camp. From the outside, the only thing setting it apart is the chaplain's flag flying near the entrance of the extended TEMPER tent.

Inside, chaplains have everything they need for religious support. Altars, lecterns, linens, candles, cross and crucifix, offering plates, communion sets and several versions of the Bible are available to support Protestant and Catholic Christians. Jewish and Islamic supplies include chaplain kits, yarmulkes, kufis, kimaras, prayer mats, Torahs and Korans.

"Demographics don't play a part in religious support. The military ab-

Courtesy photo

Servicemembers attend a Catholic worship service in the Containerized Chapel at the base camp in Kandahar Air Base, Afghanistan. The chapel is the first complete prototype built at the Soldier Systems Center and has been at the base since July.

Courtesy photo

The Containerized Chapel from the outside looks like any other extended TEMPER tent. Inside, chaplains have everything they need to provide religious support.

solutely affirms the religious needs and diversity," Wheatley said. "That's a tribute to our country."

Worshippers and staff have other amenities. The climate-controlled chapel has a portable public address system, electronic keyboard, and if nobody's able to play a song, the music will play automatically from a digital hymnal programmed with hundreds of worship songs.

Each chapel has its own generator, electrical outlets, lights and seats for 100 people. Other support items are six months worth of consumables, such as communion wafers, a TV/VCR, microwave oven, coffee pot and folding tables.

Before the chapel arrived in Kandahar, troops gathered in the airport terminal for services and tolerated intermittent power outages and oppressive heat. Another advantage is the chapel's central location in the housing area. Wheatley said average weekly attendance rose from 90 to 150.

"This allows a place and a mechanism for the full dimension of worship, including religious education classes and fellowship," Wheatley said. "It's certainly a morale-booster. It becomes very visible and noticeable. Respect for the command is enhanced when they see such a clear support for these soldiers."

Among the activities held at the Containerized Chapel in Kandahar are Bible studies and choir practice to classes on Army values leadership and suicide prevention. Chaplains even planned a one-day retreat at the chapel.

Courtesy photo

Worshippers partake in Holy Communion during a Catholic worship service in the Containerized Chapel.

Courtesy photo

A choir sings during a contemporary Protestant worship service.

Gear scouts

Group contacts troops for feedback on field equipment

By Curt Biberdorf
Editor

The soldier shivering on guard duty left an impression on Dave Cheney, then a senior enlisted advisor, during a visit to Alaska in 1978 with a project engineer who was developing new load bearing equipment.

"I said to myself 'This guy is freezing,'" Cheney recalled, now the Operational Forces Interface Group (OFIG) team leader at the U.S. Army Soldier Systems Center in Natick, Mass. "When I asked the (executive officer) who was in a heated tent if the cold weather was a problem for his troops, he said no. Then I knew we had to go to the soldier, the individual user to get accurate information."

Going to the soldiers for a first-hand account on the performance of items soldiers wear, carry or eat is the hallmark of OFIG since it was officially established in 1986.

Cheney said the Department of Army Materiel Development and Readiness (now Army Materiel Command) commander was concerned about getting soldier feedback on the items it issues and makes available to soldiers, so the Natick Research and Development Center director (now the Natick Soldier Center) established an office here.

"We always used to ask the supply officer or somebody else in command about equipment, but they usually didn't report any problems, most likely because they didn't want to cause any controversy," Cheney said.

Starting with one officer and one civilian employee, the office has grown to a staff of two enlisted advisors, three engineering psychologists, six equipment specialists, an exhibit coordinator, administrative assistant and team leader.

OFIG gains customer feedback through installation visits, user assessments, and exhibits or technical displays. When called upon, quick reaction teams respond to deployed units needing immediate assistance.

Visiting

Installation visits are the core of OFIG. The team initially visited four installations per year, but that's now expanded to as many as 10 visits annually, with at least one visit to a Navy, Air Force and Marine Corps base.

Courtesy photo

Master Sgt. Max Biela, senior enlisted advisor (left), issues shin guards to a Military Police unit from Fort McClellan, Ala., deploying to Atlanta to provide security for the 1996 Olympics. Biela is now retired from the Army and serves at OFIG as an equipment specialist.

Within two weeks after returning from a major training exercise or deployment, soldiers are gathered to fill out surveys that are tailored to their type of unit and are interviewed to help determine the functional performance and user satisfaction of items developed at the Soldier Systems Center.

"We tell them that they have an opportunity to make changes," Max Biela, an equipment specialist, said. "We always say to be perfectly honest and to tell us why they like or don't like something."

They are candid, according to Cheney, but little surprises him.

"The only thing that shocks me is to find out that a unit should have received an item six months ago, and we find out it's stuck in some supply room," Cheney said.

Surveys have shown that the infantryman spends an average of $400 of his own money purchasing gear. What they're buying is another key piece of information the team is trying to uncover, according to Biela.

Gloves, boots, flashlights and multi-purpose tools are among commonly-purchased items. OFIG compiles survey information to see if different equipment should be incorporated into the supply system.

"There are some people who won't buy anything, but almost everybody will buy something," Cheney said. "Soldiers shouldn't be buying their own equipment, but everybody has a preference. A rucksack or sleeping bag means something different to an infantryman than to someone with an office job."

Responding

Sometimes the feedback can't wait, which is why since the Gulf War, OFIG has sent a team that can immediately investigate problems with fielded equipment or provide support to equipment supplied to units deployed around the world.

In several cases, OFIG equipment specialists, many with exten-

Courtesy photo

Soldiers in Anchorage, Alaska, try on the Intermediate Cold/Wet Boots with removable liners during a user assessment in 1997.

sive military experience, have responded to a problem by escorting, sizing and fitting, and issuing equipment along with training needed in an emergency.

During Operations Desert Shield and Desert Storm, equipment specialists noticed many supplies were never distributed because shipping containers arrived without any easy way to identify what was inside or where it was supposed to go. Now every shipping container is labeled with a bar code sticker to avoid confusion and delays.

In Macedonia, equipment specialists learned that soldiers were putting wood screws into the tread of their Intermediate Cold/Wet Boots for traction, but the problem turned out to be the wrong type of rubber composition. More recently, a team from OFIG traveled to Afghanistan to try to solve problems with cold-weather clothing in the mountain environment.

Assessing

Well before any product is considered for fielding, OFIG assists project managers in locating units from a list of volunteers and coordinating user assessments. Once an appropriate unit has been identified, OFIG sets up the user assessment to meet the requirements while minimizing changes and disruptions to the unit training schedule or assessment. OFIG works with the assigned evaluator from the Army Test and Evaluation Command to ensure the unit and equipment meets the needs of the Operational Requirements Document and Test and Evaluation Master Plan, such as type of unit and climatic conditions.

Whether it's skis in Alaska, boots in Panama or a new military ration entrée in Texas, anything from prototypes to finished products judged individually or compared with competing items are subject to evaluations. Soldiers' survey feedback becomes part of the process in determining whether or not an item should be fielded or if the item needs improvement.

Just about every item goes through an assessment before it makes it to the field, according to Biela.

Displaying

As OFIG grew and became knowledgeable in all commodity areas, another function that took off was exhibits.

Because of an exhibit on Capitol Hill, the Soldier Enhancement Program was established and funded to slash research and development time to less than three years from the normally seven to 10 years by evaluating existing commercial items and adopting them into the supply system.

Cheney said the exhibits at trade shows are meant to draw interest from industry and academia to what's going on at the Soldier Systems Center and broaden manufacturing resources.

Visits to military installations give users a different chance to provide feedback on current or future soldier items. The group travels to as many as 60 locations annually, and sometimes installation visits are combined with an exhibit.

"Information is important to soldiers," Cheney said. "They want to know what's coming out. Their lives are on the line."

Editor's Note: Units interested in participating in user assessments can e-mail the OFIG office at ofigo@natick.army.mil for more information.

Courtesy photo

Soldiers' responses in surveys help determine whether or not an item should be fielded or if the item needs improvement.

Spread out

Structures team helps develop large command post tent system

By Curt Biberdorf
Editor

More space is what the Army wanted for their Tactical Operations Centers, and that's what it will get with the Large Standard Integrated Command Post System (LSICPS) being developed at the U.S. Army Soldier Systems Center in Natick, Mass.

The new shelter, under a program led by the 21st Century Fabric Structures Team for Product Manager-Platforms and U.S. Army Communications-Electronics Command in Fort Monmouth, N.J., will provide 450 square feet of space, nearly four times the size of the current Modular Command Post Tent System.

The Natick team searched the commercial market and received 10 proposals through a Commerce Business Daily request for shelter information. Of three proposals the team submitted for consideration, an air beam supported shelter and a product improved, Tent Extended Modular Personnel (TEMPER) were selected for full assessment.

A commercial "pop-up" tent and modified Modular General Purpose Tent System (MGPTS) were the other two selected for further evaluation.

All four shelters were independently tested at Aberdeen Proving Ground, Md., last fall, but only the modified TEMPER and MGPTS should meet the standards, according to Frank Kostka, 21st Century Fabric Structures Group team leader.

"Whether or not the TEMPER is the final selection, there's a strong possibility of incorporating it into the family of TEMPER tents," he said, which would add to the TEMPER's 20 present configurations.

Courtesy photo

The command post tent's main components lie on the ground before setup.

At the battalion level and up, extra space for the command staff is in demand. The standard solution now is to join multiple small SICPS shelters.

"When you put four or five of the 11-foot by 11-foot SICPS tents together, you get problems with leakage and you can't access the roof to get the snow off of them," Kostka said.

Alternatively, units are buying commercial tents, many of which are incompatible with the military operations.

"Pop-up tents are quickly erected and look military, but they're too lightweight to withstand snow load testing and not rugged enough to pass durability testing," said Kostka.

Although designed to meet the load requirements, snow knocked out the air beam tent from contention when the weight of it twisted a fitting in the air frame that resulted in leakage. Kostka said the lessons learned are useful in knowing what changes are needed to meet the requirements, and he anticipates the highly-regarded air beam technology

Courtesy photo

Six people can set up the TEMPER Large Standard Integrated Command Post System (LSICPS) in about 25 minutes. The TEMPER was one of two submissions from Natick for the LSICPS program.

Courtesy photo

An integral plenum for the heating, ventilation and air conditioning system, and integral liner for overhead lighting simplify the TEMPER LSICPS. An electrical distribution system, tables and map boards are included. The LSICPS will offer 450 square feet of space.

Courtesy photo

The TEMPER's fly was removed on the LSICPS because heat-sealed stitchless seams, used for the first time on this tent, close out moisture.

to be used in the future in command post and medical shelters.

"Everybody loves a tent that rolls out and sets itself up," he said. "Six people can set up the TEMPER LSICPS in about 25 minutes while it takes the same number of people seven minutes with the air beam."

He said users want simplicity, durability and fast setup in temperatures from -50 to 120 degrees F.

The Soldier Systems Center tent prototype shop constructed the TEMPER LSICPS sent to Aberdeen as a single 24-foot section to reduce seams and setup time of otherwise connecting three of the TEMPER's standard 8-foot sections.

The TEMPER's fly was removed because heat-sealed stitchless seams, used for the first time on this tent, close out moisture.

An integral plenum for the heating, ventilation and air conditioning system, and integral liner for overhead lighting further simplify the system.

Other components included are an electrical distribution system, tables and map boards. Attached vestibule rings are included as anchor points when the protected pathway from the vehicle carrying the system is in place. If selected, soldiers' familiarity with the TEMPER will shorten training time on setup for the LSICPS, Kostka said.

Another advantage is that the TEMPER, unlike commercial shelters, is supportable with spare parts through Defense Supply Center-Philadelphia.

"You just can't enter an (National Stock Number) and a get a delivery," Kostka said about commercial shelters.

The modified MGPTS is based on a current military design, so it's expected to also meet the requirements.

Development time for the program was shortened from three years to 10 months because they started with a mature idea and tweaked it for this application, which is a huge achievement for the government, he said.

The LSICPS is scheduled for initial fielding to the 3rd Stryker Brigade Combat Team in Alaska in 2004.