



Corps classes move to cyberspace

By Bernard Tate
Headquarters

You can find almost anything in cyberspace these days — news, games, entertainment, pen-pals, gifts, movie schedules, flowers, cards...

And now education.

On July 26, the Chief of Engineers officially opened the U.S. Army Corps of Engineers' new Virtual Campus, the home page for all of the Corps' new web-based training. Since the "campus" exists entirely in cyberspace, Lt. Gen. Joe Ballard cut a virtual "ribbon" on a computer screen in the Commanders Conference Room with a virtual "scissors." Ballard and his senior staff then watched a demonstration of the system's operation.

"Distance learning is the way of the future," Ballard said. "If we really believe in investing in people, we must educate them to be competitive for the future. But our training requirements and costs are horrendous. There's no way we can afford to get our people together for the training they need. Now, every Corps member has access to excellent training on-line, and we did it on a bare-bones budget."

The virtual campus is the Corps' first effort in web-based distance learning.

"Distance learning is any type of instruction in which the student is physically separated from the instructor by time, place, or space," said Margaret Tindal-Fisher, Employee Development Specialist in the Human Resources Development Division of the Office of the Deputy Chief of Staff for Human Resources.

"Distance learning is certainly the wave of the future," said Dr. Susan Duncan, Deputy Chief of Staff for Human Resources. "We're not in the forefront, but we're trying to catch up. It really is a significant means to save money for the Corps, and that's one of the primary purposes — to cut cost of training, and allow more people to receive training."

"We'll be able to get more employees trained," Tindal-Fisher added. "There are many employees who haven't had the opportunity to get training because of workload requirements, scheduling, and/or dollar constraints. Also, in terms of benefits to the Corps, the employees aren't away from the worksite for an extended period. They can receive web-based training if they have a two-hour block of time, or even if they just have an hour to work on it, compared to traveling away from the workplace to sit in a classroom for several days. Distance learning does not provide the total solution, but it does offer an alternative to the cost of obtaining training away from the workplace, and studies support the notion that there is no significant difference in learning at a distance versus in a classroom."

The Virtual Campus is a web-based system offering access to self-paced training courses. It is managed by the Corps' Professional Development Support Center, and can be reached by going online to <http://pdsc.usace.army.mil>, then clicking on the Distance Learning icon. Students can log onto the site and work on the course whenever they have the time, and wherever they have access to a computer.

The system resides on a server at the offices of



A screen capture shows the "buildings" of the Virtual Campus homepage.

the contractor, TRW, in Huntsville, Ala. TRW maintains and operates the system. Some of the on-line courses require tuition, and other courses such as Prevention of Sexual Harassment (POSH) and Ethics Awareness, are available at no cost. The payment must be authorized by the student's office (like any training a Corps employee takes), but the costs are far less than the cost of travel, per diem, and course material for traditional training. Another advantage of this system is that course materials can be updated far faster and at less expense.

The Virtual Campus has been in development for two years. According to Duncan and Tindal-Fisher, an Engineer Inspector General inspection in early 1998 recommended developing distance learning, and Human Resources began developing a concept of operations at that time.

"Lt. Gen. Ballard hosted a distance learning symposium in July of 1998 that really kicked this off and got managers and course proponents to start thinking about the concept," said Duncan. "Not every course is appropriate for distance learning, so we started filtering out those that are appropriate and those that aren't, and started converting courses from a traditional format to distance learning."

The courses currently available at the virtual campus are:

- Basic Financial Management
- HAZWOPER Refresher
- Inventory Management
- Ethics Awareness

- POSH
 - The CorpsPath
 - Program and Project Management Integration
- These were the first courses selected and developed, for several reasons.

"After the distance learning symposium, we received a number of requests to develop web-based courses," said Tindal-Fisher. "In particular, the logistics folks had an immediate need to complete a large amount of training Corps-wide, which would have cost them a large amount of money. So they asked what we could do to make the training available to their target audience, in a relatively short time-frame. We responded by putting the training they requested out on the Virtual Campus."

"Some of the other courses we looked at in terms of impact," Tindal-Fisher added. "For example, training in Ethics Awareness and refresher training in Prevention of Sexual Harassment is required of all Corps employees. A couple of other courses came about as a result of higher-level initiatives, like the CorpsPath, which is a series of CD/web-based learning modules, and the Program and Project Management Integration module, for example."

More courses are under development for the virtual campus.

"We're constrained by the money needed to convert the courses," said Duncan. "We don't have much of a specified budget for this, so we usually do it with year-end funds. It's a big investment upfront, but it has a great return."

Insights

Good values are habits

By Col. Lowell Moore
Chaplain, U.S. Army Corps of Engineers

"Old habits are hard to break." At least that's what they say, and during my recent trip to Hawaii I was reminded just how right they are.

After a flight to Chicago, a layover in the "Windy City," and a *l-o-n-g* flight to Honolulu, I dragged my weary body off the airplane more interested in a hotel with a bed than enjoying the tropical paradise. However, being aware of the effects of jet lag, I did not let myself go to bed until about 10 p.m., hoping that if I was tired enough I would sleep through the night.

But as tired as I was, I woke up about 1 a.m. and knew I wouldn't get back to sleep real soon. Knowing I had a full day ahead of me, I got up, took a sleeping pill, read for about an hour to give the pill time to take effect, then turned off the light and laid there trying to get back to sleep.

I don't know how many fitful hours I laid there in the dark, but I *did* manage to get to sleep a little before the alarm went off. Then, feeling the full effect of the sleeping pill and a short, restless night, I had to drag my protesting body out of the nice warm bed and press it into service.

One of the best parts of this job is getting to meet the Corps people in the field. I hoped a shower and a cup of strong coffee would pull me together enough to meet the wonderful people at Pacific Ocean Division and Honolulu District so they wouldn't think the chaplain had a hangover. (Even though I don't drink!)

During those hours I spent lying there in the dark, I kept wondering why I couldn't get back to sleep, since I was tired and it was the middle of the night. Then I hit me — since my body was in the habit of getting up every morning about 5:30 a.m. Eastern Standard Time, at 1 a.m. in Hawaii my body thought it had overslept by an hour or so and was waking up out of habit. No matter how hard I tried to convince my body that things were different here and it was OK to break the habit for a couple days, my body insisted on staying awake. All my effort, even with the help of sleeping pills, seemed helpless in overcoming the power of this habit.

It was then that I realized just how powerful habits are. As I laid there contemplating instead of sleeping, I realized that a lot more than my sleeping habits were having an influence on me, and would continue to influence me while I was in Hawaii. Habits would affect what I did in the evenings, the kind of food I ate, the language I would use, how I would treat the people I would meet, whether I would have any devotions, and so on.

We all know there are good and bad habits. Many of us have habits we would love to get rid of. Weight Watchers, Alcoholics Anonymous, and Nicoderm are only a few groups and products that make a business of helping us break habits we don't like.

However, there are many people who habitually do what is *right*, and they are admired by everyone around them. A well-established set of *values* is one of the most attractive characteristics anyone can have. You know the type — the person who you can count on to be honest, the one you can trust with your purse, the one whose word doesn't need writing to back it up, and the one who can keep a secret.



This is the kind of person we all want for a friend.

Have you ever wondered how our habits come into existence? We were not born with a set of habits like we were born with a set of toes. We *adopt* our habits, and we are *responsible* for our habits. The expression, "It's habit forming" applies to almost every act we do. Every time we do something, we are forming a habit.

We have the ability to choose our habits, and we have the ability to choose our values. Almost every American has at least a little knowledge about Christian values, which include the Ten Commandments, the teachings of Christ, and much more. Every world religion has a similar set of values that, if followed, will build a person of character.

The Army has also adopted a set of values that is certainly worth incorporating into our daily lives. They are loyalty, duty, respect, selfless service, honor, integrity, and personal courage.

However, no matter what values you adopt, they won't do much good until they are put into practice and become habit. Then, like my sleep habit, they will direct our behavior even when our surroundings and outside influences change.

I don't think this article will do much to help you with your sleep habits, nor help you overcome the effects of jet lag, but I hope it will cause you to consider the habits that control your life. I hope you will evaluate your habits, reinforce the good ones and begin working now to change the bad ones.

We are all creatures of habit, and every action you take is reinforcing a habit. Life is not habit-forming; it is forming habits.

Happy habit forming!

(The views expressed in this article are those of the author and do not represent the official policy or position of the U.S. Army Corps of Engineers, the Department of Army, the Department of Defense, or the U.S. Government.)

Vicksburg revamps big project

By Michael Logue
Vicksburg District

In 1991, the U.S. Army Corps of Engineers initiated the reevaluation of flood control plans for Mississippi's Yazoo Backwater area, a 1,450-square-mile portion of the state's flood-prone lower Delta region. On Aug. 31, Vicksburg District released its draft reformulation report, after almost a decade of work to find a solution that would meet the economic and environmental needs of the region.

During the study period, the Corps involved public agencies and citizen groups in a consensus effort to improve the business and social climate for one of the nation's poorest regions, and restore almost 100 square miles of bottom land hardwoods in this important environmental region.

"Our task has been to provide protection to businesses, infrastructure, and residents of the south Mississippi Delta, while notably improving the future of the region's environment," said Kent Parrish, the senior project manager.

The Corps' proposals use structural and nonstructural features to meet the Office of Management and Budget reformulation study directives of greater flood protection for urban areas, reduced levels of agricultural intensification, and reduced impacts on the environment, Parrish said.

The backwater solution includes a pumping station, conservation easements, reforestation, and improved water management in the backwater area.

"Numerous Mississippi counties covering almost 1,000 square miles will be spared frequent flooding, while almost 100 square miles will be reforested," Parrish said.

Preliminary agency project data state the proposed solutions will:

- Reforest privately owned bottomland hardwoods at federal cost.
- Restore crucial fish spawning and rearing habitat.
- Raise water levels by almost three feet during low water seasons.
- Restore habitat for threatened black bear and endangered pond berry.
- Reduce forest fragmentation, creating large, contiguous forest.
- Restore critical habitat for transcontinental migratory birds, including one of seven priority conservation areas in the U.S.

"We are proposing a project that will increase aquatic, wetland and terrestrial resources, and meet the human needs of the area," Parrish said.

The plan has a benefit-to-cost ratio of 1.48, which means it will return \$1.48 cents for every dollar spent to build and maintain the project.

Parrish noted that the Corps' benefits statistics do not include regional benefits such as in-

Continued on next page



TAC team learns soldier skills

By Julie Shoemaker
Transatlantic Programs Center

Support to the Army, a basic value of the U.S. Army Corps of Engineers, requires different levels of effort at different locations. In Kuwait, the Transatlantic Programs Center (TAC) Installation Support Office (ISO) staff recently joined in the military training experience with their soldier counterparts.

The ISO staff supports the Army's Director of Public Works and the Air Force Base Civil Engineer with their daily and critical mission requirements. Typical support includes maintenance and repair projects, minor construction, utility and infrastructure upgrades, and base operations.

Less typical support for an ISO staff is the support for military training exercises.

"Camp Doha was preparing for a training exercise involving the need for nuclear, biological and chemical (NBC) protective gear," said Maj. Christopher Felchlin, TAC's Deputy Gulf Regional Engineer. "The intended scenario was a suspected chemical attack by a terrorist group trying to enter the camp."

Ron Rowland, TAC's ISO chief, determined that participating in the exercise required a crash basic NBC training course for the civilian ISO team members, since none of them had ever received that type of training. Felchlin was the instructor.

"Using the *Soldier's Manual of Common Tasks*, the manual that every Army basic trainee is given and uses, I developed a class that covered the necessary basic skills," Felchlin said.

The training was conducted the early part of June, just before the base exercise.

"I started at the beginning and taught them how to put on the protective suit, including what order the various pieces went in, and how to put on the protective mask in the allotted time," Felchlin said. "Then we moved on to some basic decontamination skills and even how to drink water while wearing the mask — all skills found in the *Soldier's Manual*."

Military Oriented Protective Posture (MOPP) is determined in levels, with each requiring a distinct response, donning various additional pieces of the protective gear.



(Left) Maj. Christopher Felchlin helps William Barna with the last item of MOPP-4 gear. (Above) Felchlin shows how to get a drink while in a protective mask. (Photos courtesy of Transatlantic Programs Center)

- MOPP-1 -- Overgarments, pants, and jacket.
- MOPP-2 -- Overboots and blouse.
- MOPP-3 -- Mask and hood.
- MOPP-4 -- Gloves.

When the exercise began, the available ISO staff participated.

"Though we weren't perfect in donning the gear, we all *did* get it on and remained in it for the duration of the exercise — continuing to work on projects," Felchlin said. "The staff gained firsthand knowledge for what it would be like to have to work in MOPP-4 for long periods of time, such as soldiers did during the Gulf War."

"Although we were only in MOPP-4 for one hour, the staff was glad to get out of the gear at the end of the exercise. The 104-degree heat was one contributing factor for their joy," said Felchlin. "But now they all understand the importance of the basic



The team holds signs to show who is who while in MOPP-4 gear. What this photo does not show is the 104-degree heat they are enduring. (Photo courtesy of Transatlantic Programs Center)

knowledge they learned, and they have confidence that the training could save their lives."

Felchlin expects to hold similar training for other Corps civilians throughout the Middle East region.

Project

Continued from previous page
creased jobs, economic stability, improvements in health and welfare, and numerous other positive area impacts.

The total cost of the project is \$181.6 million, with 37 percent of the project cost committed to improvement and restoration of the environment.

Pumping plant operations would be managed to begin pumping at elevation 87 NGVD while the nonstructural component would provide for purchasing conservation easements from willing sellers or those agricultural lands located below the 87-foot elevation. These lands would be reforested as part of the project.

"Our task has been to provide a project that meets competing needs in the Yazoo Backwater area, while returning the cost to the Treasury during the life of the project," Parrish said. "We are ready for the public to look at our proposals and give us feedback."

With the report published in the *Federal Register*, the Corps now begins a 60-day review process to allow agencies, organizations and individuals to review the draft report. The Corps will then consider all comments

received and finalize a recommendation for consideration by the Congress.

"We are opening the door to maximize dialog, and we want the final report to reflect that effort," Parrish said.

The Corps will open a website on Sept. 5 where the recommended plan can be reviewed. The public will be able to ask questions, submit comments, get e-mail project updates, read comments, and stay informed. The backwater website can be found on the Vicksburg District's homepage at www.mvk.usace.army.mil.

Michael Logue, the Vicksburg District Public Affairs Officer, said he would personally respond to questions sent to the project's e-mail box.

Copies of the report may be requested from the web site or by e-mail at yazoobackwater@usace.army.mil, or write to:

U.S. Army Engineer District,
Vicksburg, Attn: Public Affairs Office
(Michael Logue), 4155 East Clay St.,
Vicksburg, Miss. 39183-3435.

The report will also be provided to public libraries in Natchez, Greenville, Clarksdale, Rolling Fork, and Vicksburg, all in Mississippi.



The improvements planned for the Yazoo Backwater in Mississippi will help prevent disasters like this flood in 1973. (Photo courtesy of Vicksburg District)

Starfleet's grandpa?

Omaha District helps build headquarters for Space Command

By Liam Anselm Bickford
Omaha District

Throughout the Space Age, the U.S. Army Corps of Engineers has played a vital role in building facilities to build, launch, and control space vehicles. Omaha District continues this tradition as they help build the Space Command Headquarters Complex.

Some are calling the complex at Peterson Air Force Base in Colorado Springs, Colo., the most significant project in modern times because it may supercede the Pentagon in strategic significance in 10 years. Vincent Turner, one of Omaha District's project managers, said he is proud to be part of the project because it is "the focal point for all future control of everything to do with space, including traffic control of launches and satellites, communications and defense, and reconnaissance and intelligence."

Last year, Omaha District awarded the \$55.7 million design/build contract for the facility to Swinerton and Walberg. Working with the Corps' project management team, the firm will build two new headquarters buildings beside the current Air Force Space Command Headquarters (HQAFSPC). Swinerton and Walberg teamed with Merrick and Company for engineering and architectural design work.

One of the new buildings will house the headquarters for North American Aerospace Defense Command (NORAD) and the U.S. Space Command (SPACECOM). The other will house Army Space Command Headquarters (ARSPACE). Along with the current HQAFSPC, the two new buildings will be centralized in a campus-like setting providing easy access between buildings and coordination between the military services.

In a 133,000-square-foot area, the new combined headquarters building for NORAD and SPACECOM will accommodate more than 800 staff. Although the existing headquarters building was designed for only 450 people, it currently holds 675.

Locating the new ARSPACE building on Peterson AFB will improve coordination and communications with other elements of SPACECOM. It will also unify in Colorado Springs all the currently separate elements of ARSPACE and U.S. Army Space and Missile Defense Command (ASMDC).

"The two commands work hand-in-glove on several key areas, therefore it's good to have the staffs working together in one spot," said Lt. Gen. George Macdonald, NORAD Deputy Commander in Chief.

The importance of this close, immediate coordination cannot be overstated, especially in an era of high-tempo military operations.

"Today it takes almost three days in travel time to have a two-hour meeting in Colorado Springs with the commander," said Vice Admiral Herbert Browne, Deputy Commander in Chief



This artist's conception shows how the Space Command Headquarters will look. (Graphic courtesy of Omaha District)

of SPACECOM. "Now they'll be able to gather together quickly in the headquarters and work important issues."

Opportunity for the Corps

Col. Mark Tillotson, Omaha District Engineer, said this kind of large-complex design/build project is a great opportunity for the Corps to demonstrate its capabilities. "The current AFSPC building was a model facility in its time. But these facilities will be a model for future architecture, combining technical competence and modern technology with economy of utility and function. This is an opportunity to create better working conditions for servicemen, and an opportunity to strengthen relations between the Air Force, the Army and NORAD."

Challenging project

The project team members identified and discussed many issues. According to Mike Armstrong, another project manager, project dollars were limited. "Cost growth is a serious risk."

Turner said time-growth has serious consequences. "But the biggest risk, is the potential disconnect between user requirements and deliverability."

Turner said the Corps realized economies of scale when the Army and Air Force, each with their own visions and money, reached a difficult consensus on design, aesthetic factors, and cost-sharing on sitework and utilities.

Tillotson said the greatest benefits to the district will be experience gained from tight interagency partnering, and the opportunity to work with Corps Headquarters on building a facility that supports servicemen.

"The timeline on this project is focused, and meeting the challenge will benefit everyone," he said. "This facility will incorporate more modern technology than older facilities could."

Armstrong and Turner developed a transition outline and diligently man-

aged scope by working with ARSPACE team members Larry McKennon and Hugh Mason, and AFSPC representative Bryon Bednar.

Armstrong said establishing clear authority lines is important.

"We (the PM team) wanted to avoid an adversarial environment by getting off on the right foot with the contractor, establishing a good working relationship during the contract through close communications and partnering," he said. "Determining what was needed to develop and maintain that relationship was essential."

"We have a good team," said Armstrong. "We invited all partners to weekly design and construction meetings to discuss progress and efforts with a who, what, where, when, and why agenda."

Just a few of the challenges facing the PM team are completing the project on time and within budget, keeping everybody informed, and ensuring all defined requirements are met. Other challenges identified by Turner were integrating the contract activities with other support contractors and maintaining uninterrupted access to the existing AFSPC building, along with maintaining team unity, and spending every penny wisely.

Some goals for partnering with the other agencies involved ensuring a common understanding of the design-build process, responding quickly to concerns, understanding each organizations' processes, and conflict resolution.

Paul Jendzejec, Rocky Mountain Area Resident Engineer at Peterson AFB, is responsible for construction contract management and quality assurance for the project. Omaha District's responsibilities are contract administration, design review, quality assurance monitoring, evaluation of construction progress, contractor performance, and on-site customer point of coordination during construction.

NWD's Missouri River Regional Office handles program coordination be-

tween HQAFSPC, HQSMDC and HQUSACE to validate scope, siting, funding, cost, and schedule changes.

Tillotson believes this project validates the necessity of project management teams in meeting the challenges of the business and delivery processes.

"With the tight timeline, this contract had all the complications of multiple small projects combined into one," says Tillotson. "Mike Armstrong and Vince Turner are to be commended on their persistence and dedication. They have come through against all obstacles. In recognition of their abilities, it should be stressed there were simply too many impediments to overcome and remain timely, yet they overcame and succeeded."

With enthusiastic support from engineering and construction team players, the district's ensures the Space Command Headquarters has the necessary tools to do the job.

Explosive commercial growth

Why is control of space and space traffic so important?

A report by the National Defense Panel published in December, 1997 said that, in 1996, for the first time, commercial space launches exceeded military launches in the U.S., and commercial space revenues outstripped government space expenditures. The report said the U.S. has invested more than \$100 billion in space, with another \$500 billion invested worldwide.

That report adds that more than 1,100 commercial companies in 53 countries develop, manufacture, and operate space systems. In the next century, space may decide the outcome of conflicts, or even the nature of war. Today, space systems support our forces across the full spectrum of conflict, from peacekeeping to war.

The new complex will play a key role in synchronizing Army, Navy, and Air Force space assets. It will identify future space needs and advocate systems to meet them. With expected completion in fall of 2002, the complex is being built to head off threats from space before they materialize, and to further the well-being of all humanity.

The defense panel report says space industries are growing 20 percent annually. In the last few years, more than 1,000 new satellites were launched and about \$600 billion spent worldwide on space applications. The report concluded that space is becoming inextricably linked to life on Earth.

As space products and services become interwoven with our nation's politics, economics, culture, and security, they become a target for adversaries. A could gain an advantage by disrupting U.S. ability to access and use space.

As space becomes an area of vital national interest, Gen. Ralph Eberhart, commander of NORAD, is preparing to defend it. "Control of space is essential to achieving the force multiplying effect of information superiority."

USACE sets furniture standards

Article and Photo
By Kim Gillespie
Huntsville Center

The barracks modernization program is a major effort to give soldiers the best, most modern living quarters in Army history, and the U.S. Army Corps of Engineers plays a vital role in that program.

But after the barracks are built, soldiers must live in them, and to live comfortably they need good furniture. Who sets the standards for furniture, to make sure that high-quality furniture is consistently procured throughout the Army?

The Corps does, specifically the U.S. Army Engineer and Support Center, Huntsville.

Centralized procurement of unaccompanied personnel housing (UPH, or barracks) furnishings has resulted in several improvements to the Army's furnishings program in the past few years. Besides furnishing more rooms faster, Huntsville Center has ensured that soldiers consistently receive quality furnishings that meet their needs, regardless of the supplier.

Developing specifications (specs) especially for UPH barracks furnishings has been a major contribution to the improved quality.

Quality

Alicia Allen, Huntsville Center project manager for the UPH Furnishings Centralized Procurement Program said, "It's especially important to have good specs for furniture because there is such a wide range of quality available in the commercially produced items available through General Services Administration (GSA) schedules. Unfortunately, without the right specification, our soldiers can end up with substandard furniture, or furnishings that are inconsistent."

The Huntsville Center found this to be a problem for furnishings delivered under the centralized procurement program. For this reason, a UPH barracks furnishings specification was necessary.

One of the largest problems that existed before the UPH specification was developed was trying to determine the materials and methods of construction. According to Jay Clark, Huntsville Center's technical lead for the UPH Furnishings Program and primary developer of the specification, product literature is just a marketing tool.

"You quickly realize that basic terms such as 'solid wood' and 'plywood' really means different things to different people," Clark said.

Teamwork

Teamwork was key to the success of developing the UPH furniture specification. The specification was developed by Huntsville Center's Architectural Branch using previously developed criteria and getting input from the furnishings management offices at the installations, from GSA, and from the suppliers who commonly produce furniture for UPH barracks. Corps interior designers were consulted as well.

Clark notes that the furniture specification exceeds industry standards in some areas, but that is necessary to meet soldier requirements. "The installations would have liked even *sturdier* furniture, while the suppliers would have liked fewer deviations from industry standards but, all in all, the specification works for almost everyone."

Barbara Nagy, furniture management officer for Fort Lewis, Wash., sees the benefits of the UPH specification. "I'm a big fan of the three-quarter-inch backings and face framing. It certainly increases durability," said Nagy. "The spec was developed by the team, so it really *does* meet everyone's needs. What we see is that it has leveled the play-



Most rooms in an Army barracks have four to five pieces of standard furniture.

ing field of vendors and increased the quality and standards for the furniture. Previously, furniture management officers like me would request a specific vendor because the quality varied so much. Now, if our specified vendor is not the awarded vendor, we don't have to worry that the furniture will not meet our requirements."

Special needs

This specification, developed by Huntsville Center and enforced by GSA, is tailored to meet the special requirements of soldiers, which include frequent moves, heavy loads, and using the furniture to hold heavy items like field packs. "The goal of writing a good specification is to make our work easier and our customer happier with the product," said Allen. "These specifications increase the longevity of the items and are not luxury requests."

According to Clark, "The specification does not specify construction techniques, but *does* specify parameters for items that have been inconsistent in the past, such as substrate, thickness of backs and bottoms of drawers, edgbanding, and door construction for larger pieces such as entertainment centers. We found by talking to the team that many times the items stored by soldiers are heavier, and thus a thin pressed wood backing, or thin wood, just doesn't hold up. We also find that soldiers hang heavy backpacks or field gear on the doors of wall units, so the doors and associated hardware need to be more substantial than what you would provide in a standard residence."

Also, the nature of today's Army means that furniture is moved more frequently. Allen said, "While normally furniture stays in the rooms for which it is bought and configured, the reality is that, for soldiers, there are frequent moves of furniture, which means increased wear and tear."

Style and finish

Another feature of the specification is to establish general standards for style and finishes. According to Allen, the goal of the Army Chief of Staff for Installation Management is for a soldier to feel

at home in the barracks despite frequent moves. "If the furnishings look similar, and the items of furniture are somewhat standard, the adjustment period is easier for the soldier," Allen said.

Similar appearance and finish color also means that furniture may be more easily moved between buildings, even if buildings were originally furnished by different suppliers. This means less inventory of spare furniture, an important factor for cost-conscious installations.

Besides the quality and appearance improvement to the delivered furniture, the results have been positive for Huntsville Center's business practices as well, according to Allen and Clark.

Business improvements

"The spec has reduced review time of the quotations, lessened the substitution of items or components by vendors, and increased the installations' acceptance of a larger field of vendors," Allen said. "It has also allowed more emphasis on the long term performance of the contractor, including such services as the quality of installation and warranty services offered."

"It takes much less time to prepare a package for procurement since we don't have to describe each piece of casegoods on each different procurement," added Clark. "Instead, we just refer to the overall specification."

The improvements from the UPH furnishing specs have impacts beyond the Army's centralized barracks furniture procurements. The GSA recently adopted the UPH furniture specification for their most recently awarded Special Order Program contract. This program, which allows government agencies to purchase only a pre-selected type of furniture, is used when a quick delivery is needed, or when a specific vendor or style is not important. All GSA customers (including military services) who choose to purchase furniture under the Special Order Program will receive furniture produced in accordance with the UPH furniture specification.

But the best result is the difference the specification makes for soldiers. "It improves the quality of life for our soldiers in the barracks," concluded Allen.

Urban rescue is tough training

Article by Jan Duchnowski
Photos by Norm Skjelbreia
Seattle District

It fell flat like a cake taken out of the oven too soon. All that was left when Seattle's Kingdome was demolished last March was 130,000 tons of rubble. Some of the monstrous crowd that gathered cheered, others felt sad, but Joe Marsh saw a training opportunity too good to pass up.

Marsh is a technical search specialist with Seattle District's Urban Search and Rescue (US&R) team. He convinced the city and contractor safety officials that the rubble site would be a perfect training area for the district's US&R mission.

For several hours, the whole team went through the scenario of searching for victims and shoring up dangerous areas. The Seattle Fire Department people said they were impressed with their professionalism, according to Marsh.

Seattle District (along with Japan Engineering District) has the largest US&R team in the Corps. There are two parts to the US&R team. Besides Marsh, the team's technical search specialists are Mike Fleming, Dean Peron, Dave Spicer, and Dennis Fitzpatrick. Structure specialists include Norm Skjelbreia (who heads the US&R team) Larry Fragomeli, Jim Skrinde, and Alan Smith.

Technical search specialists look and listen for buried victims using a STOLS listening device. The System to Locate Survivors was designed by the Waterways Experiment Station in Vicksburg, Miss.,



Seattle District's Urban Search and Rescue team simulates a search for trapped victims in the Kingdome rubble. From left to right are Joe Marsh, Mike Fleming, Dean Peron, and Dave Spicer.

and can home in on a victim buried under as much as 75 feet of debris.

Structure specialists evaluate the damage to see if the area is safe to enter. They can also shore-up dangerous areas. One or two structure specialists always go along with the technical search specialists and have the final say on whether it is safe to enter a building or area.

To enlist the help of these Seattle District volunteers, a request would come through channels to the commander and the Emergency Management Office. "Normally, we're the reserve guys who augment the FEMA taskforce during a disaster. We're also a FORSCOM asset, and that request would come through headquarters from Forces Command."

Marsh said that Arill Berg, Chief of the Emergency Management Office, would grab the phone and say something like, "Norm, we need two structure specialists and your STOLS technical search team to deploy to (whatever site), and quick." *Quick* means they must depart within six hours.

These are time-critical missions, Marsh adds. "You grab your bag and the STOLS; the structure people take the specialized equipment."

To qualify as a volunteer on the US&R team, members attend Rescue System I, a 40-hour course on using ropes and rappelling. Then there is specialized training for another week, and some refresher courses every two to three years.

When the Kingdome implosion gave the team a great opportunity to practice disaster training, they also invited the Seattle Fire Department's technical response team to participate. Bulldozers and cranes were operated that day by a demolition contractor, making the site appear like a real life-threatening scenario.

"We learned a lot," Marsh said. "I deliberately made it difficult, a stressful environment just like the real thing. It was exactly the kind of training we need."

The training exercise also gave the Seattle area search and rescue community a look at the capabilities of the district's US&R team.



Structure specialists practice techniques for shoring up damaged buildings.



Larry Zirkle practices with the System to Locate Survivors (STOLS).



A member of the Snohomish County search and rescue team practices rappelling.

District buries unexploded ordnance

By George Hanley
Kansas City District

Reporters' questions and the roar of a dragline marked the end of an unexploded ordnance (UXO) problem that has threatened St. Louis, Mo. for years.

The Kansas City District press conference announced the end to rifle grenades and mortar shells buried at Jefferson Barracks in St. Louis since World War I.

Fortunately, nature and not an amateur archaeologist unearthed the dangerous UXO in 1996 on the Mississippi River bank at historic Jefferson Barracks. To protect the public, the Missouri Air National Guard (MoANG) called on Kansas City District to eliminate this hazard.

Jefferson Barracks, established in 1826 for the 1st Infantry, is the oldest Army post in continuous use west of the Mississippi. That long history of Army occupation attracts artifact hunters. The Mississippi River is the eastern boundary of the installation, which is within the St. Louis city limits. MoANG currently owns the property overlooking the dump site where the ordnance was discovered.

The riverbank served as the post's dumping ground from the late 1800s to early 1900s. Disposal in the river was a common and acceptable practice during that time.

Erosion and fluctuating river levels uncovered the disposal site a few years ago. It was thought to contain mostly refuse from everyday 19th century military life. In spite of MoANG efforts to keep this area off-limits, artifact hunters liked to comb the rubble looking for relics.

Three years ago the site turned from a nuisance to a potential killing ground. World War I ordnance like mortar shells, grenades, fuses, flash tubes, and .30 caliber ammunition began surfacing among the debris.

What made the situation especially dangerous were two facts — some of the rusted ordnance was not readily distinguished from harmless objects like an old muffler, and there were six elementary schools in walking distance of the unguarded site.

The situation demanded action. District personnel decided on a program of education, elimination, and remediation. They began by warning the public through press releases, signs, posters, and school assembly programs conducted by the former project technical manager, Dan Ahern.

"Children do not understand that an explosive device throws out fragments; it's not just a firecracker or a noisemaker," Ahern said. "Sample devices loaned by the DoD Ordnance Disposal Unit at Scott Air Force Base helped show what bombs are about. The little boys in the group venerated these teaching tools as if they were holy relics."

Simultaneously, the prompt removal and destruction of any unexploded ordnance that surfaced was another pri-



A barge-mounted crane places boulders on the revetment which buried an old disposal site filled with unexploded ordnance. (Photo courtesy of Kansas City District)

ority. In the three years before actual construction of the final remedy at the site, 1,363 ordnance items were disposed of by the Fort Leonard Wood Ordnance Disposal Detachment.

Work continued on remedial design and construction. Press events and public meetings informed the public of this effort. Josephine Newton-Lund,

the district's current environmental manager for Jefferson Barracks, summarized that portion of the program.

"We considered three alternatives before recommending a revetment to cover the riverbank with two-ton stones," Newton-Lund said. "The Missouri Department of Natural Resources and the Environmental Protection

Agency agreed."

The project wasn't a one-district show; it was a partnership. Since the dump was a Formerly Used Defense Site, Kansas City District was responsible for funding.

The Hydrologic and Hydraulics Branch of St. Louis District prepared the design and specifications, and provided on-site supervision. An ordnance and explosives team from St. Louis District provided on-site ordnance avoidance and removal.

Huntsville Center reviewed the project design and suggested locations for warning signs. The MoANG installed the signs. Total project cost was about \$500,000.

This past July the Corps completed the revetment. The riprap, quarried from the opposite bank of the river, was moved by barge to Jefferson Barracks. A barge-mounted crane and dragline placed thousands of tons of rock along about 650 linear feet of shoreline, burying the hazard.

St. Louis District and MoANG will monitor the revetment and warning signs, while Kansas City District will manage and coordinate all funding.

SHOALS surveys Lake Tahoe

By Phillip Brozek
Sacramento District

Lake Tahoe is one of North America's deepest, clearest lakes. But it is also a lake in peril. Exquisite scenery, abundant outdoor activities, and world-class entertainment make the region a popular destination to live and vacation. But decades of development and exploitation, starting with the Comstock Silver rush in 1860s, has caused significant, perhaps, irreparable harm. The lake's clarity has declined 30 percent in just 30 years.

In 1997, a series of public workshops identified nine thresholds that, if not arrested, would lead to the permanent loss of the lake's deep blue clarity. The workshops culminated in a Presidential Forum attended by President Clinton and many ranking members of Congress and the administration. A resulting executive order established an Federal Interagency Partnership to work with state and local entities to preserve this national treasure.

Sacramento District is an active participant in this federal interagency partnership. Besides doing projects in the Corps' normal authorities, opportunities sometime exist to cooperate in joint efforts not ordinary by Corps standards. The survey of Lake Tahoe was such an opportunity.

The U.S. Geological Survey (USGS) had already mapped the deeper portions of the lake (more than 1,600 feet deep) using a sonar multi-beam system. But this technology could not capture the shallow water portions of the lake. Sacramento District contracted with Mobile District's Joint Airborne Lidar



The SHOALS aircraft flies over the North Shore of Lake Tahoe during a survey pass. (Photo courtesy of Sacramento District)

Bathymetry Technical Center of Expertise to bring their Scanning Hydrographic Operational Airborne Lidar Survey (SHOALS) system to Lake Tahoe. SHOALS surveyed the shallow areas to provide a complete map of the lake bottom.

SHOALS is state-of-the-art technology that uses a laser mounted on an aircraft to determine the water depth by measuring the time difference in laser energy returns from the water surface and the lake bottom. The system has been successfully used on projects from the Great Lakes to the Bahamas to Redondo Beach to New Zealand.

The survey, which covered the

shoreline to water depths of about 110 feet, required repeated passes along the steep shore of the mountain lake at an altitude of less than 1,000 feet. Even though each pass covered a width of about 350 feet, many passes were required to cover the entire lake's shoreline during the four-and-a-half day effort.

The combined Corps/USGS data will be used in on-going research studying the cause and effect of lakeshore erosion. These data will be instrumental in understanding both natural and manmade processes regarding shoreline erosion, a presumed significant source of unwanted nutrients entering the lake.

Maritime cadets take summer voyages on dredges

Article and Photos
By Jim Edwards
Portland District

Some know they are destined for a career at sea. Others follow a relative, or someone they admire. Still others hear or read sea-stories and are drawn into a life on Earth's last frontier. Regardless of how they make the choice, for some of these talented future mariners the path to sea leads through the U.S. Army Corps of Engineers.

Each year, cadets from maritime academies in the U.S. look for opportunities to earn their sea-time on a variety of ocean-going vessels. The top performers get to choose from huge tankers, container cargo vessels, Military Sealift Command ships, and other opportunities to complete 60-day periods of sea duty.

Some lucky cadets ship out with the dredges *Essayons* and *Yaquina* assigned to Portland District.

"We get a lot of hands-on experience in ship handling on the dredges," said Mary O'Brien, a midshipman 2nd class assigned to the *Essayons*. "With a tanker, you're talking a lot of sea voyages, and very little turning and maneuvering. Working on a dredge, we are handling the ship all the time, calculating tides, currents, and all that. We might spin the ship on a dime at times. You just don't get that on a tanker."

"Cadets who come back from the dredges are not as nervous as those who were on the deep-water ships," agreed Casey O'Donnell, a midshipman 2nd class aboard the *Yaquina*. "The Corps has a good reputation among the cadets at the Maine Maritime Academy. I chose the *Yaquina* because of word-of-mouth. We get to handle a lot of

close-quarter work, and there is nothing like that experience anywhere else."

Six cadets gained experience on board Corps dredges this season. Three came from a maritime academy in California, and three from one in Maine.

"We love it," said Miguel Jimenez, captain of the *Yaquina*. "We had two cadets this year and they were like a breath of fresh air. They were full of energy and enthusiasm, and always eager to learn. Having fresh blood and all this eagerness aboard is a lift for the whole crew. Some of the crew members take the cadets under their wing and we all benefit from their presence."

This spring the *Essayons* carried four cadets, two each from the Califor-

nia and Maine maritime academies. "It's a great program," said Neal Nyberg, captain of the *Essayons*. "There are sound reasons why we participate. We have the chance to train new officers for the industry. Whether we (the Corps) get them or not, it's a benefit for the whole industry."

The program takes young cadets, usually in their second or third year at an academy, and puts them on a Corps dredge for 60 days straight. It takes a lot of effort and patience by both cadet and crew to make the program work, said Nyberg, but the benefits are undeniable.

"There's an initial net loss to train a new cadet," Nyberg said. "Maybe we break even by the end of the first 60

days. Then they start pitching in, using some of their new abilities. After their 60 sea days of cadet time, we often hire them as dredge helpers under the 'Stay In School' program during the summer. They earn money to help them pay their tuition, and we get good work in exchange."

"The cadets are always asking questions about everything we do," said Jimenez. "I think one of the little realized side benefits to the program is that it makes the crew act as instructors, which in turn sharpens their skills. The constant questions and our answers to those questions make us reexamine some of the ways we do things. A cadet might ask a question and as I answer it I might say to myself, 'I don't like the way that explanation sounded.' So we may decide to re-look the way we do this."

In addition, both skippers agreed that the cadets and their almost boundless energy lighten the workload for the rest of the crew.

"A lot of the work is painting, chipping, line handling, and maintaining the ship," said Mathew Lazarski, a midshipman 1st class in the Naval Reserve. "But there are some good teachers here and I've learned a lot from them. I plan on being an officer in the Navy, and some of the valuable lessons they taught me are how to approach problems in everyday life on the ship."

"It's the hands-on experience that I like on the ship," said Brian Leet, a midshipman 2nd class also on the *Essayons*. "I've talked to a lot of other guys in the engine room and have learned a lot just from them telling me about where they worked before com-

ing to the Corps. I was surprised at how many hawsepipers work here." A hawsepiper worked his or her way up the ranks in the maritime services, rather than graduating from an academy. "There's just a lot of experience."

"I wanted to be a (ship) pilot when I graduated," says James Dalske, a midshipman 2nd class on the *Yaquina*. "With a dredge, you're not so much navigating a vessel, as piloting in and out of all the coves. I chose the *Yaquina*

Lazarski. He and Leet spend a lot of time below decks during their training time. "We'd go on rounds every hour, checking for oil levels, for smells and sounds out of the ordinary," said Leet. "After a while you kind of get a feel for the way an engine and ship sound."

"We're constantly checking and re-checking," Lazarski agreed. "If you have an overload on a generator, it'll shut down. Even though we have back-ups, we have to learn to maintain and fix everything on the ship."

"When you ask about duties, I'm a cadet, a welder, a dredge helper and a cook — and that was just today," said Dalske. "We're constantly fabricating stuff. We made firehose racks, repaired a bulkhead from angle iron, and I welded a hole that wore through a dredge pipe. I like to stay busy."

After completing their sea time and summer jobs on the dredges, the cadets will return to their academies and their next voyage as seniors will place them in charge of most operations of the academy training ships. All the cadets agreed that serving aboard a Corps dredge was a great way to prepare for the challenges ahead.

"I've learned a lot about piloting," said Dalske. "I've built a lot of confidence in that from my experience here. Next summer I'll be a senior and will have to practice docking a big ship. I was a bit nervous before coming here; now it'll be a breeze."

"One of the best things was the training in ship handling," said O'Donnell. "It's nerve-wracking being on a 200-foot ship and being close to things. At the academy, we have a 40-foot ship and they flip out if you get close to a buoy. There are very few places where I'll ever get to do this kind of close-quarter work."

O'Brien felt that experience operating the dredge controls under the watchful eye of the crew was invaluable training as well. "It was the best seat in the house," she said.

Both Captains Jimenez and Nyberg hope to see the program continue for many years with the Corps. "We'd like to have more of them," says Nyberg. "We're trying to get some on board during the winter weeks."

"We've never had a problem with any of our cadets throughout the history of the program," said Jimenez. "They've always been first-rate people. From a social context, they keep things alive and fresh on board."

Other benefits of the program go beyond benefits to just the Corps, both captains agree. "Global competition is a fact of life for the merchant marine," said Nyberg. "We forget that 95 percent of the cargo and equipment for Desert Storm was brought by ship. Right now we're training the best and brightest to be the future mates on our ships, and that's good for everyone."



Mary O'Brien sits in the "pit," the dredge control console, on the bridge of the *Essayons*. "The best seat in the house," said O'Brien.



Brian Leet (left), and Mathew Lazarski explain their duties in the *Essayons*' engine control room.



Mathew Lazarski (left), Mary O'Brien, and Brian Leet stand on the dock in Astoria, Ore., with the dredge *Essayons*.

Bottoms up!

Innovative workers replate old barge; save time, money

Article and Photos
By Brenda Beasley
Memphis District

A 60-year-old barge got a new "bottom of steel," but not by swimming laps in the Mississippi River. It took almost four months for 23 metalworkers at Ensley Engineer Yard and Marine Maintenance Center to weld a new bottom on the old barge.

By designing and building a frame to hold a solid mass of 65 pieces of steel needed for the hull, the metalworkers cut six weeks off the project time and saved \$100,000, according to Ricky Shoaf, chief of the Shops Unit. By the time they're finished, they'll have welded almost one mile in linear feet.

The barge was originally built in 1941. Rock Island District uses it as a gate barge, to carry huge lock and dam gates when they need to be repaired or replaced. The barge's hull is made of steel and, over the years, the steel has worn thin.

"This isn't the first time we've replated a barge, but it's the first time we've had one this large," said Shoaf. A standard barge is 30 feet wide and 120 feet long, but this barge is 40 feet wide and 270 feet long.

The crew at Ensley began the work in April by sandblasting the hull to clean it and to remove lead-based paint. Then they took readings to determine the hull's thickness and the kind of shape it was in. The results went to Rock Island District so they could decide what work they wanted done.

Rock Island District decided to replate the whole barge — the hull and the knuckles (the curve where the side meets the bottom) with 5/16-inch-thick steel, and the rake (the slanted front and rear edges of the barge hull) with half-inch-thick steel. "When the barge is pushed up on the bank, the rake is the area that takes the most abuse," said Shoaf. "So it needs thicker steel."

Replating the entire hull of such a large barge presented many challenges. Because the barge is so huge, they had to use their large floating drydock. The normal way of proceeding would have been very time-consuming and difficult.

One choice was to pull the 8x20 foot, 5/16-inch-thick steel through the blocks that held up the barge, then lift them up and tack them in place. But since the distance from the bottom of the barge to the drydock floor is only about four feet, that presented a very confined space to pull in large sheets of steel, lift them up, then weld them in place.

Then they had to consider how to get to the areas of the hull that were sitting on the blocks. There were two choices, both laborious. One was to lower the drydock and move the barge over, and the other was to lower a couple of blocks at a time. Lowering the blocks is done by two men twisting the jack screws, which can take a couple hours to lower one.

There had to be a better way. When they put their heads together, Jimmy Dodds suggested putting the steel on the bottom of the hull in one big sheet, according to Jim Curry, metalworker welder. The team of Curry, Terry Phifer, Curtis Pigram, Winford Henson, Dwight Alston, and Marc West took that idea and ran with it.

Innovation. Necessity is the mother of invention, they say. The solution was to build a frame to hold the steel sheets, flood the drydock, float the barge in, drain the drydock to settle the barge onto the sheets, then weld everything together.

Easier said than done.

First the Ensley crew built the frame to keep the steel sheets from sagging once they were laid on the blocks that hold up the barge. Then the steel sheets were connected by a "buck weld," which is a



The welders only had about four feet of headroom to work once the barge sat on its framework.

2x12-inch piece of steel attached at each side of the sheet. This essentially connected all the steel into one big sheet.

So how do you weld a flat sheet of metal to a barge sitting flat on top of it? They put plug holes in the steel sheets — holes drilled every 24 inches. Then once the barge sat on the steel sheets, the welders could weld around the plug holes to attach the steel sheets to the old bottom.

Precision. But why were the plug holes precisely 24 inches apart? Since the bottom of the hull was very dented, the plug wells had to line up with the stiffeners inside the barge. Each stiffener is a half-inch angle iron that runs the length of the hull, and they are spaced 24 inches apart. West made a grid so the plug wells would match the stiffeners.

Then came the hard part. With the drydock flooded, the Ensley crew had to guide a barge 40 feet wide and 270 feet long into the drydock, and match its bottom with the plug hole grid, with half-inch precision. All while not being able to see a thing through the brown Mississippi River water.

But that's what tape-measures are for. The Ensley crew measured exactly where they wanted that barge to line up, then welded two big I-beams into the drydock to guide the barge to precisely where they wanted it to rest.

Welding. With the barge in place and the drydock drained, the welders could finally go to work. The frame kept the new steel bottom from sagging away from the barge, while hydraulic jacks pushed the steel solid against the barge so the plug holes could be tacked in place, said Alston, the metalworker welder who led the project.

Once the welding was done on the sheets that were in sight, the crew flooded the drydock, moved the barge to one side, then drained the drydock again so the welders could weld the sheets that had been sitting on the blocks.

About 70 strips of 5/16-inch steel, each about six feet long and shaped to fit the curve of the knuckles, were welded in place.

The rake required four pieces of 8x30-foot steel



Welders work on the forward rake of the barge.

sheets, and four pieces of 6x20-foot steel sheets. The crew faced another challenge when a crane was not available to put the sheets on the rake. "We normally put the sheets up with a crane," said Alston. "Instead, we put them up with a forklift using lifting lugs and an extension pole."

A quality control inspection followed the welding to ensure that there were no leaks or pinholes.

The outside of the barge is now complete, and some of the structural angle iron inside the barge is being replaced. By about the middle of this month, the 60-year-old barge will be armed with a new steel bottom to tackle the mighty Mississippi River.

Tree screen saves river channel

By Terrie Hatfield
St. Louis District



This photo taken during the Great Flood of 1993 shows the tree screen in the background. (Photo courtesy of St. Louis District)

growth and water-resistance, plus strategic placement of other vegetation.

The trees will be selectively harvested in an arrangement with the landowners and local levee board so their shade does not prevent undergrowth. This also provides timber as a cash crop for landowners.

Consistent, continuing application, including ongoing tree planting, has maintained the river in its original channel, and navigation has been sustained around Thompson Bend.

This erosion control method has

been so successful that Rapp is widely recognized in developing vegetative solutions for overbank and bankline erosion problems. This work is changing the way the Corps deals with severe erosion problems, while benefiting the environment.

Rapp's paper, "Preventing a Cut-Off of a Mississippi River Bendway with Tree Screens" was a finalist in the Permanent International Association of Navigation Congress competition, and was published in 1989. More tree screens are being established.

In a letter to the St. Louis District Engineer in November 1998, Lester Goodin, President, Buffalo Island/Thompson Bend Soil Conservation Association wrote, "The approach had never been attempted before, and it worked! It was recognized nationally and with State Conservation Awards. The Corps unfortunately seldom receives credit for such...hands-on management and knowledge as Jerry's. The concept is structurally sound, environmentally proactive, and economically viable... Thank you and all your staff."

The idea worked far beyond expectations during the Great Flood of 1993. Even though about 40 percent of the trees were killed, they remained anchored in place. No one realized, when they started, that a 100-foot tree-screen would cut flood velocities in half. Rapp and Goodin measured flows with a Global Positioning System and Acoustic Doppler Current Profiler. Flows measured about eight feet per second going into the screens, and about four feet per second coming out. This led to far less erosion, increased deposition of sediment and eventual healing.

The tree screens planted in the original Dry Bayou high bank in 1986 held even through both the 1993 and 1995 floods. Tim Searchinger, Senior Attorney for the Environmental Defense Fund, told Goodin "this is...an ideal project, a credit to everyone involved."

Marathoner runs for funds

By Kim Gillespie
Huntsville Center

John Buckley is running not only for his life, but also for the lives of leukemia and lymphoma patients. Buckley, an instructional systems specialist for the Professional Development and Support Center (PDSC), began running about three years ago, mainly to improve his health. Last year he decided to try a marathon, so he joined the Team In Training program of the Leukemia/Lymphoma Society of America in November.

"The Team in Training program offers professional coaching in exchange for support of the Leukemia Society," said Buckley. "I had heard of the Leukemia/Lymphoma Society of America, but I didn't know about all the great things it does for research and treatment of patients. Just knowing how much it helps kids is a great feeling."

He planned to run the Leukemia Society's Rock'n'Roll Marathon in San Diego, Calif., on June 4, and set a fundraising goal of \$3,300. In both cases, Buckley exceeded his goals. "I ran two marathons and raised over \$3,900!"

Buckley decided to run the Country Music Marathon in Nashville, Tenn., on April 29 as a warm-up for the San Diego marathon. With a little more than four months of training, Buckley finished the race in four hours and 54 minutes. "It was definitely high-paced training. I do about five miles a day,



John Buckley raises funds for Leukemia/Lymphoma Society of America by running marathons. (Photo courtesy of Huntsville Center)

with 10 miles on weekend days. I also ran 20 miles on pre-race Saturdays."

Buckley then ran the San Diego marathon in five hours and 20 min-

utes. "It was a lot hotter, so I had to slow my pace some."

It's said that anyone who finishes a marathon in an upright position is a winner, so Buckley is certainly a winner in that sense. But he *really* feels like a winner in fund raising. "I contacted friends, groups, associations, church, and businesses I was close to through a fund-raising letter. People were just unbelievably generous."

Buckley also chose to run on behalf of eight-year-old Crayton Miller of Huntsville, Ala. "Crayton has been on chemotherapy since he was six years old and has another six months of chemo," said Buckley. "He's just like any other typical eight-year-old boy with one exception — he has leukemia."

Crayton's mother is also a Department of Defense employee and works on Redstone Arsenal. "I really sympathize with the parents, because I've seen how difficult it is for them," Buckley said. "The time and expense of treatment is enormous."

He encourages others who run and are interested in marathon training to participate in the Leukemia Society's program. Buckley also encourages people to take up running for health. "It's a great stress reliever and a good way to get to know people. I run regularly with about five of my friends."

In the meantime, Buckley plans to continue his marathon runs. "I plan to run Huntsville's Rocket City Marathon next."

At a bend in the Mississippi River, just above the confluence with the Ohio River, the stream flows in a broad sweeping reverse curve. This large meander has created an agriculturally rich 10,000-acre peninsula-like area called Dry Bayou-Thompson Bend.

At first glance, this bend wouldn't appear to present any problems. But, over time, it has experienced such severe erosion that the river had begun to scour a new channel across the peninsula. If an efficient solution were not found, a navigation crisis could occur.

This 17-mile reach, if destroyed, would cause a break in the 2,300-mile channel. A new channel across the peninsula could not support even the smallest tows, and the existing channel would be too shallow for navigation most of the time. Southbound traffic would halt above the bend, and northbound traffic from New Orleans could not progress north of Cairo, Ill.

The erosion was so severe that it also threatened the Commerce to Birds Point Federal Levee, which protects thousands of square miles of property.

A solution to this critical, unique problem required river engineering intuition, in-depth experience in hydraulics technology, plus a thorough understanding of the river and of all impacts of its changes.

And it was critical to establish a partnership with the farmers, landowners, and political interests who reside near the bend and whose livelihood depends on productive crops and the river's ability to transport them.

With resources scarce, St. Louis District could not dedicate a lot of engineers to this project. But about 14 years ago, the district's engineering managers determined that one man, hydraulic engineer Jerry Rapp, could fill all the shoes. So Rapp got the difficult task of evaluating and developing a solution to the Dry Bayou-Thompson Bend erosion problem.

Channel development would be time-consuming and costly, so Rapp's mission was to develop a non-structural, environmentally beneficial solution to stop the erosion.

Technology to resolve this problem did not exist, so Rapp rolled up his sleeves and began 14 years of trial and error. During this time the Great Flood of 1993 occurred and the major flood of 1995, plus many other high water events. These caused setbacks, but also provided valuable opportunities to collect data and evaluate the work.

Rapp was assisted by a support team, with significant contributions by Sharon Wolf, Real Estate Division, and Dan Erickson, Riverlands Project Office. Many years of hard work created a tree-screen/riparian corridor (a buffer strip of trees planted between the riverbank and the floodplain) now called the Thompson Bend Riparian Corridor Project.

The project includes cottonwood trees and other hardwoods bred for fast

'This little piggie found an oil well'

By Timothy Hartsfield
Tulsa District

Remember the old nursery rhyme in which this little piggy went to market, and this little piggy stayed home? Well, the little piggy in *this* story went to a wallow and rooted out abandoned oil wells on public lands at Oologah Lake in Tulsa District.

The lake was built atop an old oilfield that dates back into the 1880s. Since this was during Oklahoma Territorial days and no state regulatory agency existed until 1917, it's easy to see how an old oil well or two could be forgotten and lost.

Oil wells of this vintage were either left open or plugged haphazardly with soil, rocks, tree trunks, feed sacks, anything handy. Today's technical ability to properly plug a well with a permanent cement seal in the wellbore simply didn't exist back then. As these old wells age, they commonly begin seeping small amounts of natural gas and oil.

During construction of Lake Oologah, Tulsa District crews walked shoulder-to-shoulder cross-country searching for old wells. More than 12,000 were plugged at that time. Since the lake filled, Oologah Project has responded to occasional reports of seeping gas and oil, performing about 50 plugging operations.

Hunters recently found an oily seep in the Spender Creek area when they noticed a large area of trees with trunks that looked as if they'd been wrapped in slick black plastic. Feral pigs (domestic hogs gone wild) had long ago found the oily spot and transformed it into a wallow. Covered in clay mud and crude oil, the porkers were probably impervious to flies, ticks, and other external parasites.

Tracks showed that after leaving the wallow, pigs would scratch and rub on surrounding tree trunks, leaving a thick black coating of clay and grease-like oil. Tree trunks were covered pig-snot high all around the seep site. Pig paradise.

Lake Manager John Carmichael started work to alleviate this particular oily problem spot as soon as outdoorsmen reported it. As part of the process, Carmichael asked a local oilfield contractor to check out the reported oily spot and offer his insight. This is where Wesley Griner of Big Sky Oil Well Services met one very protective mama pig.

This particular pig paradise was located in a dark, thick wood about a quarter mile off a county road. Griner had to park and walk in. He had a shovel to do a little probing in the wallow. Griner did just that, then straightened up to and looked directly into the wary eyes of a mama pig about 20 feet away.

Not expecting any problem, Griner

tried to shoo the sow away by yelling and waving. But instead of moving off, she straightaway attacked!

Poor Griner was astonished! Wild pigs seldom attack people, but this one did. He tried to run, but was knocked to the ground and had his shirt torn. He got up and landed one good lick with the shovel that didn't faze the old sow. She continued to butt and snap at him as he worked his way through the woods back to the safety of his pickup.

Returning the next day with stalwart but disbelieving reinforcements, Griner and his crew came across a litter of piglets near the wallow. Mama wasn't around at the moment, but that explained her less-than-hospitable behavior; she had only been protecting her family from an otherwise well-meaning invader.

At this particular site, the original well casing had been unscrewed about six feet below grade, then buried. To properly plug the well, a backhoe operator dug around in the pig wallow until he found the casing stub. After the contractor moved in his well service rig, they used a short piece of new casing to extend the mouth of the well up to a suitable working height above ground level.



Generations of feral hogs turned an old oil well into a wallow. (Photo courtesy of Tulsa District)

For three days, the well service crew used a hydraulically powered rotating swivel and a drill bit and drill pipe to gingerly feel their way into the old well bore as they drilled. Caution was in order because the crew did not know what foreign material might be in the well. There could be timber, iron, cement, almost anything at any depth.

The drill's behavior had to be constantly monitored; running into iron or steel in the hole would quickly ruin a drill bit and might even stick the drill string in the hole.

Besides preventing surface pollution and controlling the waste of natural resources, placing cement plugs during abandonment of any oil well prevents vertical migration and cross-flow con-

tamination of groundwater reservoirs.

The deepest fresh water aquifer in the area is 250 feet. Working with a field representative of the Oklahoma Corporation Commission, they determined that a new cement plug had to be set continuously from a depth of 300 feet all the way to the surface. This 300-foot long cement plug, pumped from the bottom up through the drill pipe, was designed to completely cover and protect any possible fresh water zones.

As time rolls along and long-lost wells continue to age, more oily spots and seeps will be discovered. The folks at Oologah Lake, backed by the resources of Tulsa District and a few itchy pigs, will continue to stop potential environmental damage.

District gets new haztox probe

Article by Nancy Gould
Photo by Jonas Jordan
Savannah District

Last December, Savannah District added the "66 Series" Geoprobe to its arsenal of contamination detection and remediation tools. The powerful new \$130,000 direct push machine has already proven to be a valuable investment for the district's Hazardous, Toxic, Radioactive Waste (HTRW) program, which has \$7 million for in-house work in fiscal year 2000.

The "66 Series" pushes well casings and investigative probes to greater depths faster than the district's older Geoprobe. It can apply 30,000 pounds of pressure using a nitrogen-charged hammer to hit a driving rod into the earth at a rate of 33 times a second.

"We can install two-inch wells now," said Tom Whitacre, geologist in the Geology/Hydrogeology & HTRW Design Section. "We were limited to half-inch wells with the smaller Geoprobe. The two-inch diameter provides extra space that allows us to install more instrumentation. We can also collect larger soil and groundwater samples."

Recently the district used the new machine to install monitoring wells as deep as 100 feet at contaminated sites at Fort Benning, Ga. The smaller Geoprobe is limited to shallow wells up to 30 feet deep. In the past, the drill rig was used almost exclusively for



The 66 Series Geoprobe can drive two-inch wells as deep as 100 feet.

wells deeper than 30 feet, even though the work is slower and more costly.

Wesley Herman, drill rig operator, said the new Geoprobe is fast compared to other drilling tools. He has installed as many as 20 30-foot wells with the new system in *one day* — a job that would take two to three weeks with the drill rig. The new system is cleaner, safer, and less tiring, Herman said.

The Geoprobe also has another major benefit. It generates minimal Industrial Waste (IDW) compared to the drill rig. Disposing of IDW incurs even

more costs.

Both Geoprobe systems have contamination probes similar to the Site Characterization and Analysis Penetrometer System, which is the investigative tool-of-choice for some sites with petroleum contamination at depths of 100 feet or less.

But the new Geoprobe has features not available on the smaller Geoprobe. The Membrane Interface Probe detects volatile substances through vertical soil readings it takes as it is driven into the ground. The readings reveal where monitoring wells should be placed. Another probe collects soils stratigraphy data, which identifies sands and clays.

Besides investigative work, the new track-mounted Geoprobe can perform various kinds of remediation such as pumping Oxygen Release Compound underground, a process performed at the Marine Corps Air Station in Beaufort, S.C., to eliminate gasoline contamination of groundwater.

Whitacre said the maneuverability of the compact Geoprobe makes it easy to reposition. The machine moves back and forth easily in small areas and can maneuver through shallow water, soft sands, or muddy fields.

"We've gotten a lot of positive feedback on the new Geoprobe from customers," Whitacre said. "We're saving them money and getting the work done more quickly."

'Scorecard' measures financial performance of Huntsville Center

By Betty Neff
U.S. Army Engineering and Support Center, Huntsville

Businesses often rely on profit as the ultimate measure of corporate health. But where does that leave nonprofit government organizations? How can they determine competitive performance, efficiency, and "bottom line" measures in the absence of profit?

The Engineering and Support Center in Huntsville, Ala., developed a scorecard to track overall financial performance by substituting customer savings for profit. Huntsville Center's savings are calculated through the corporate rollup of the four metrics summarized in the accompanying table.

Analyzed together, those metrics show the result of the efficiency initiatives that Huntsville Center has adopted since 1995 when it first started to use the Army Performance Improvement Criteria to manage change.

By tracking several measures of improvement, the center has more confidence that results are reliable. With several measures, the weaknesses of one are diminished by the strengths of the others, providing a web of information rather than a dot of datum.

Still, each individual metric reflects a certain facet of performance. As explained below, each is sensitive to a specific aspect of corporate health.

In-house percent of total expenditures

This metric tells how much of the customer's dollar the center uses to execute work. Think of it as the money needed to keep the center's doors open. From fiscal year 1992 (FY92) through FY95, Huntsville Center used 11.3 percent of all expenditures to execute work. Between FY96 and FY99, the center reduced that to 8.1 percent.

Although results could mean the center merely contracted out more work, three conditions indicate that the change was due to improved efficiency.

First, the level of in-house design or execution has been consistent and fairly small historically. Since the center's major role is to provide technical oversight on technical contracts, it has always contracted out almost all execution, or partnered with a U.S. Army Corps of Engineers' district. Center policy is to retain the minimum design work in-house to maintain technical skills.

Second, analysis shows that Huntsville Center has increased its ability to execute more work with fewer resources on specific projects, especially in operations and maintenance.

Third, results are reinforced by another positive scorecard trend, workload per full-time equivalent (FTE, or the work done by one person employed full-time).

FISCAL YEAR	92 - 95		96 - 99	CHANGE	99 ONLY	CHANGE	
In-house costs vs. total expenditures	11.3 %	A P I C	7.7 %	32 %	6.4 %	43 %	
G & A	42 %		28 %	33 %	24 %	43 %	
TLM	2.80		2.40	14 %	2.42%	14 %	
Workload per FTE (Current Year Dollars)	\$735K		\$1,064K	45 %	\$1,356K	84 %	
Total Savings = \$80.3 Million							1 Sept 2000

Workload per FTE

This metric is a macro-level indicator of productivity amortized across the work force. "Workload" equals total expenditures, or all work (in-house technical oversight and contract management, any in-house design, and work performed by contractors or supporting Corps elements). The center uses expenditures rather than obligations to determine workload, since obligations merely signify planned, not executed, work.

Workload per FTE parallels the concept used by the DoD, Office of Management and Budget, and Congress to fund programs. This metric is limited to high-level analysis of productivity over time, or comparisons to similar organizations. For program or project levels, other factors, such as unique requirements and technical complexity, complete the analysis.

The table shows that from FY96 through FY99 Huntsville Center's productivity increased 45 percent. Because the nature of the center's work is stable, center leadership attributes that positive trend to increased efficiency across the organization. Furthermore, positive trends in other scoreboard indicators support that analysis.

General and administrative (G&A)

G&A is how the center accounts for overhead costs distributed across the organization, that is, costs that cannot be charged directly to a project, but are

necessary to running a business. G&A rates reflect performance in two areas — overhead accounting practices and overhead structure. With a significant reduction in G&A rates since 1995, Huntsville Center has performed well in both areas.

Furthermore, of the four scorecard metrics, G&A may be the most sensitive to change and is, therefore, useful as an early warning indicator. If a well-established G&A rate changes, the other indicators may not be far behind. Therefore, a changed G&A deserves thorough analysis together with all the metrics

in the scorecard. Driving the G&A too low can result in other organizational stress, such as insufficient training or inadequate technology upgrades.

One more word on Huntsville Center's G&A. Although the center's G&A rates do not reflect the money the Army pays for rent, that amount would not affect the improvement delta over time, since

the Army always provided that money. The rate reduction would still equal 30 percent. Rent also has no effect on major comparisons to large military districts. Since the Army pays rent for all military organizations, those comparisons are parallel.

Engineering total labor multiplier (TLM)

TLM is the factor Huntsville Center uses to calculate hourly rates for billing customers. TLM, therefore, has a direct affect on customer costs. The TLM rate is calculated from G&A, departmental overhead, fringe benefits, and base labor, thereby accounting for all costs accrued by one functional unit. The center's engineering TLM improved 14 percent since 1995.

The basic impact of TLM is on the hourly rate paid by customers. However, if an organization's processes are not efficient, a low TLM will not guarantee low costs to the customer. Inefficient processes will drive up costs through longer cycle time. Low TLMs and increased productivity go hand-in-hand to yield true cost savings.

Huntsville Center's current engineering TLM, when matched with its higher workload per FTE trend, indicates that total cost to the customer is lower now than before 1995.

Furthermore, because TLM is used by industry and across the Corps, it lends itself to competitive comparison.

Overall, Huntsville Center's scorecard shows improvements in efficiency since 1995, a key factor in providing services at reasonable costs.

That translates into savings to our customers and the Army. The \$80 million in total savings since 1995 equals the training budget for a mechanized infantry or an armor division.

The \$80 million in savings equals the training budget of a mechanized infantry or armor division.



"Curious" won an honorable mention in the People category.



"Shangri-La" won second place in the Nature Scenic category.

Corps photographer tops in Korea

Article and Photos
By Gloria Stanley
Far East District

Dennis Gier, Chief of Quality Assurance Branch at the Tongduchon Resident Office in Far East District, is also an award-winning photographer. He has entered half a dozen photography competitions, but this year he entered the Eighth U.S. Army (EUSA) Photography Contest and won *four* awards, including Best of Show.

Gier also placed first in the People category with his entry "This Is Why I Trek" (which also won Best of Show). "Shangri-La" placed second in the Nature Scenic category and "Curious" took an Honorable Mention in the People category.

Forty of the 108 entries in the competition were displayed during July in the Moyer Recreation Center at Yongsan Garrison in Seoul. Gier's photos and the other first, second, and honorable mention winners in each category will be the EUSA entries in the Army-wide competition which will be judged in Washington, D.C., this fall.

Started young. Gier became interested in photography when he was 15. His grandfather introduced Gier to 35mm photography and took him out on shoots.

"I bought my first Nikon here in Korea at the Taegu PX when I arrived in 1972," said Gier. "I was the deputy facility engineer in Taegu with the Area Facilities Engineer." Gier was a soldier then and had selected the engineers as his branch after completing his full ROTC scholarship at the University of Dayton.

"I was much more conservative when I was younger, and I wasn't focused," Gier said. "I was happy to have one great frame out of 1,000. Now I burn a lot of film and listen to what people say when they look at my photographs."

Gier, who also paints as a hobby, has been involved with photography for years, and he learns from talking to other photographers, but he hasn't taken any formal classes. Gier says he has learned a lot at the Moyer Recreation Center photo lab.

"Mr. Cho has been real helpful this past year," Gier said. "He's the photo lab director. I've learned by doing and I read photography magazines. I also have photography books. I'm an artist at heart. I have books on design and composition and I've read and studied a lot. I observe other masters and try to put my spin on it through my mind's eye."



Dennis Gier with his Best of Show photo, titled "This Is Why I Trek."

A Nikon FM2 is his main camera. He has had his present FM2 for 15 years and it is fully manual — no auto focus. He also sets the speed and aperture for every photograph. Gier likes natural lighting so that the photograph is as close to what he saw as possible. "I look for that situation where the natural light gets my message across."

Gier doesn't compete every year, but he says that competitions give both affirmation and recognition.

"I use it as sort of a feedback tool for gauging my own progress; how do mine compare with other people's photographs," Gier said. "The other thing is when you put your stuff out you hear what other people say about it."

The photos. Gier says his favorite subject category used to be landscapes, but looking back over the years he says he has always enjoyed people shots.

"The pictures that endure, their message is as fresh today as it was 20 years ago, are people shots," said Gier. "The glimmer in the eye, the expressions, are the same now as they were years ago. The pictures I enjoy looking at are people shots. I *do* like landscapes, the lighting. When I shoot landscapes, I'm not shooting the landscape *per se*. I'm shooting the lighting effect."

"Shangri-La" was taken in Nepal. It is a photograph of the 800-year-old Tengboche Monastery with the Himalaya Mountains in the background. Gier scoped out the scene the day before, then starting shooting about 5 a.m. the next morning when he knew the lighting would be right. Besides the lighting, the dark frame of trees and the snow-covered mountains give it depth, and there is also the inter-

play between the ancient manmade monastery and the natural environment.

"A good photograph has something to initially attract you, but also the longer you look at it the more you see," Gier says. "It should have various levels of understanding."

His Best of Show photograph, "This Is Why I Trek," was also taken in Nepal.

"In this photograph, you first notice the scale of the hiking boots to the size of the children," Gier says. "The children are silhouetted in the doorway. No distractions. You see the big boots; you see the children's faces."

Gier says a good photograph is timeless and complete in itself. You don't have to know who owns the boot, or who the children are. He says a classic photo is one that you can't add anything to or take anything from to make it better.

This photograph also answers a question that many people ask Gier. Why does he trek? "It's to capture these moments," said Gier. "It's about meeting people. It's about capturing the moment that passes quickly in a beautiful setting. Moments you don't capture at home watching television. When you're out exploring your world, you capture these moments, and that's reason enough."

His third photograph, "Curious," is an older man silhouetted by a dark doorway. At first glance, you think he's the subject of the photograph, but then you also see two children peeking into the picture from the back doorway.

Gier says his short-term goal is to close to his subject, and his long-term goal is to create a body of work both in photography and painting.

More out of life. He says photography and painting complement each other. The difference between painting and photography, Gier says, is that painting is additive. You start with a blank canvas, and you must add everything to the canvas needed to create the image in your mind.

When you put a camera in front of reality you see *everything* (pimples, gray hair) and the photographer's job is to subtract from the image whatever is not necessary to convey the message.

"In our fast-paced world, everything vies for our attention," said Gier. "Photography forces you to stop and see the here-and-now. Probably the greatest thing for me is that it makes me stop along the way when I'm trekking. Photography allows me to get more out of life. Even when I don't have my camera, I see things I wouldn't see if I hadn't trained my mind."

Around the Corps

Tall ships

About 80 New England District (NED) employees assisted more than a quarter million visitors at the Cape Cod Canal during Operation Sail 2000. Thirty-seven tall ships passed through the canal, four stopping at the Massachusetts Maritime Academy. NED was one of many local, state, and federal agencies providing drinking water, medical tents, outdoor toilets, and trash receptacles.

"Our mission was to accommodate the large crowds of people and boaters safely, as well as to provide visitor assistance and regulation enforcement," said Park Manager Bill Norman of the Cape Cod Canal Field Office.

The staff handled several medical situations including a broken arm, a head injury, a hand injury, a leg injury, and a visitor with chest pains. The boat crew responded to small boat incidents including groundings and vessels losing power in the canal current.

The night shift was also busy. "They made sure that everything was clean when the crowds arrived during the day," Norman said.

Rescue

"Help! We're headed into the dam!"

That plea changed an ordinary day into a lifesaving event, and Keith Bloomer, Darrell Navratil, and Dave Peterson at Lock and Dam 14 in Rock Island District didn't hesitate a second.

"At about 11:30 a.m., shouts for help were heard coming from above the dam," said Peterson. "Keith Bloomer and I were just letting a recreation craft out of the main lock. We went to the upper end and saw a ski boat with four people drifting toward the dam above tainter gates three and four. Keith prepared the upper lifeboat for launching, while I lowered gates three and four and called Darrell Navratil to help.

"The individuals in the boat had an anchor in the water and had stopped drifting toward the dam about 250 feet above tainter gate three," said Peterson. "Darrell and I pulled alongside in our lifeboat, secured them to us, and backed up along the outside wing wall and into the approach for the main lock. Then we towed their boat to the ramp below the auxiliary lock where they secured it and called someone to come get them."



Dave Peterson organized the rescue. (Photo courtesy of Rock Island District)

New navigation system

The Topographic Engineering Center (TEC) has developed a new hydrographic navigation system based on the global positioning system (GPS). The Real-Time Kinematic (RTK) GPS Tides concept eliminates the tidal uncertainties of hydrographic surveys in coastal areas. TEC is pursuing a patent for this technology.

The system uses a land-based GPS reference station operating in a carrier differential mode. Radio signals transmit carrier differential information to ships in the approach channels, enabling their GPS receivers to produce centimeter-level, three-dimensional positions every second. This information is coupled with the ship's keel distance below the GPS receiver. This allows ships to load more precisely with respect to the bottom of the navigation channel. Today, ships know depths below the keel, but the information is not relative to a fixed vertical datum, and the actual bottom changes continuously. The new method allows vessels to carry more cargo.



Soldiers work on the floating bridge. (Photo courtesy of Little Rock District)

Bridging exercise

Fifteen combat support units from the active Army, Reserves, and National Guard recently built a bridge across the Arkansas River near Fort Smith using 44 22-foot floating bridge sections. Operation Motague Norte involved 950 soldiers and climaxed two weeks of training at Fort Chaffee, Ark. During the first week, the units trained on their role to support the mission. Then they joined forces to build the bridge.

About 70 guests on the motor vessel *Shorty Baird*, including 12 general officers, watched the operation. Little Rock District's Russellville Project Office provided the boat and crew.

The operation took place in flows of about 25,000 cubic feet per second — almost ideal conditions, but that was no accident.

"We worked with the exercise leaders to find out the conditions they were trying to simulate," said Glen Raible of Reservoir Control. "We worked with Southwestern Power Administration to get them to not generate at full capacity at the Robert S. Kerr's hydropower plant. We also brought the upstream pool at Trimble Lock and Dam down so we could give the soldiers a window to work in if SWPA had to open up the generators, or if the flows changed."

San Francisco bridge

Engineers and technical experts from the Corps are doing a four-month, \$1.38 million analysis of plans by the California Department of Transportation (Caltrans) to retrofit or replace the east span of the San Francisco-Oakland Bay Bridge.

Under project manager Jerry Gianelli, a 20-per-

son team from five districts and South Pacific Division has assembled in Sacramento District headquarters to conduct the analysis. Their review began June 27 and will be complete this month.

The team will address whether a retrofit is preferable to replacing the span, and whether the replacement proposed by Caltrans is seismically safe.

"We'll evaluate technical assumptions, engineering analyses, and cost estimates in existing sources of data," said Gianelli. "Specifically, we're looking at reports, backup data, and other analyses provided by Caltrans, the city, and relevant outside experts."

Supercomputer

A research project to test advanced computing technology will begin this fall. The Major Shared Resource Center (MSRC) in the Engineer Research and Development Center, the Arctic Region Supercomputing Center (ARSC) at the University of Alaska Fairbanks, and SGI announced a joint effort to build a 512-processor single-system supercomputer, using the newest NUMAflex modular technology.

The SGI Origin 3000 series machine, one of the first to employ NUMAflex, will be installed at the MSRC, providing access to authorized researchers via high-speed networks from anywhere in the U.S.

"This 512-processor system will give government and academic researchers access to the most advanced NUMA shared-memory computing architecture," said Bradley Comes, MRSC Director. "A partnership like this across academia, government, and industry enhances opportunities for information exchange, which can only help scientists do better research."

Although the system is located at the MSRC, as part of this agreement the MSRC, ARSC, and SGI will each contribute resources and expertise.

Patent

Roger Brown, a physical scientist with the Topographic Engineering Center, received patent number 6,064,760 for "Method for Rigorous Reshaping of Stereo Imagery with Digital Photogrammetric Workstation." The method allows a more rigorous sensor model from stereo imagery to be handled with a simpler mathematical model of aerial vertical frame photography. It can be used by a larger group and provides better exploitation of the stereoscopic data.

225 years

'We don't surrender much!'

(Editor's note: This is another in a continuing series of true stories from the history of the U.S. Army Corps of Engineers to commemorate the Corps' 225th year. This one is from the Office of History publication, "The History of the U.S. Army Corps of Engineers," 870-1-45.)

At the end of 1862, Col. William Innes and 391 men of the First Michigan Engineers were repairing roads and railroads at the rear of the Union Army near Murfreesboro (Stones River), Tenn. A Confederate cavalry division commanded by Gen. Joseph Wheeler flanked the Union Army to strike hard at supply trains on the way from Nashville to Stone's River.

The surprise attack left Innes and the engineers without time to escape the gray-clad troopers, and Innes rushed his men up a nearby hill.

From the top of the hill, Innes could see the advancing Confederate columns and realized he had no time to entrench his positions. But the hill was covered with clumps of red cedar trees, and Innes quickly decided to use this resource:

He sent the engineers scrambling around the hill, slashing down the small trees to open a field of fire, and piling the cedars in a waist-high circle around the crest of the hill.

Confederates in greatly superior force soon surrounded the hill. An officer under a flag of truce advanced to demand surrender from the engineer detachment. He was surprised by Innes' acerbic reply. "Tell Gen. Wheeler I'll see him damned first. We don't surrender much. Let him take us."

Confederate cavalry soldiers swept up the hill toward the position, but a volley of fire hurled them back pell-mell. The Confederates then unlimbered field artillery and began pounding the hill, but the engineers scraped shallow foxholes and held their ground. A second cavalry assault followed, then a third.

In all, the cavalry made seven attempts to take the hill, yet the engineers stood their ground until the Confederates concluded the effort was not worth the cost. The engineers suffered 11 casualties; the Confederates nearly 50.

Dredge sites entice water birds

Article by Nancy Gould
Photo by Jonas Jordan
Savannah District

The number of birds nesting in Savannah District's two disposal areas this past June soared beyond last year's figures, reinforcing the district's decision to use the areas as habitat for shorebirds and other water birds such as terns and black skimmers.

The disposal areas, created originally to hold sediment dredged from Savannah Harbor, were modified for additional use as bird habitats — an initiative required by a wetlands mitigation plan developed by Planning Division biologists Steven Calver and William Bailey.

When Calver monitored the disposal areas recently, he found a remarkable increase in the number of shorebirds on the islands since the first nesting season in 1999. Besides the increase in nesting species, the area also attracted migratory shorebirds, including some rare species such as a European male ruff, one of only six spotted in North America last spring.

In the first nesting season Calver counted more than 100 least tern nests, 20 gull billed tern nests, and 20 black skimmer nests, among others on the two islands. This year there were more than 250 least terns, 160 gull billed tern nests, and more than 70 black skimmer nests. Beside the increase in nesting birds, so far this year the islands have hosted more than 35,000 shorebirds of 30 species; 5,900 wading birds of 13 species; and 10,600 waterfowl of 19 species.

Large numbers of shorebirds and waterfowl have historically been attracted to the district's seven containment areas on the South Carolina side of the Savannah River. The birds nest and rest on the sediment dredged from the harbor and deposited into these areas. Each spring they dine on exposed invertebrates left behind as weirs slowly drain water out of the areas. But the containment areas often became dry before chicks nesting there could mature, and without water they starve or become prey to other wildlife.

The wetlands mitigation plan requires that the containment areas hold water so that young wildlife can complete their nesting. Some containment areas hold water year-round, providing food for shorebirds and waterfowl in the fall and winter.

But even before the mitigation plan was implemented, Operations Division, which manages the dredging, began holding water in the containment areas, giving shorebirds immediate benefits.

According to Alan Garrett, Operations Navigation project manager, the division responded to sporadic requests from the U.S. Fish and Wildlife Service to assist shore birds. It could help as long as changes to dredging contracts had no substantial impact on costs and schedules. Now, as part of a cooperative plan with environmental



Two least tern chicks seek protection from the sun and predators.

agencies, the district has made enhancement of shorebird habitat part of its operational planning in an effort to ease the shore bird crisis caused by excessive development along the eastern seaboard.

Because the dredged material is deposited in wetlands, the Georgia Department of Transportation, owner of the containment areas, is required by the Clean Water Act to mitigate the negative environmental impacts when

wetlands are used to store dredged material. In the past, mitigation has always been off-site. The plan that Calver and Bailey developed, using the Corps' 1996 Long-Term Management Plan, mitigates wetland impacts from a newly diked disposal area (Area 14A). This plan not only requires that water be held in the containment areas for longer periods, but also requires creation of two nesting islands in each disposal area. Each island measures

about 250 feet in diameter.

According to Garrett, as much as 15,000 cubic yards of sediment and water is pumped into a single containment area (500-900 acres) daily from routine harbor maintenance. It is from this dried sediment that the islands are created.

The first islands were built in the winter of 1998, primarily with sediment from the containment area where each is located. Bulldozers pushed dried sediment in large piles to form the islands, then topped each with sandy sediment from other parts of the containment areas for a natural sandy surface.

Ditches were dug around the two islands in Area 14A to isolate the islands from the remainder of the site and hold ponded water around it. But ditches were not needed around the two islands in Area 14B because water naturally ponded at the low elevation of the sites where the islands were built.

Now shore birds nesting in the containment areas have natural water barriers around them. Their young are protected from predators, and adults and their chicks have wet areas where they can feed.

Although disposal areas and artificial islands are not technically wetlands, they have already provided functional wetland benefits for the wildlife that resides there.

Baby eagles safe at Corps dam

Article by Mary Beth Thompson
Photo by Devin Foor
Baltimore District

Just as light peeks over the forested slopes surrounding Raystown Lake dam, the cries of three hungry bald eagle fledglings break the morning peace. They are notifying their mother that it's time for breakfast.

The fledglings provide Raystown's two dam tenders, who live in houses next to the dam, with a reliable, if not always desirable, wake-up service. Head dam tender Ken Honstine pointed out the pine trees on the slope below the houses that the young bald eagles favor at dawn.

"They holler until their mom feeds them," Honstine said. He described how she goes fishing and returns with one fish. Then the fledglings' individual personalities assert themselves in almost comical fashion as they go after their meal. Two drag the fish from here to there, while the other sits on a nearby fence and watches for the right moment to pounce.

"The mother just stays back, keeps an eye on their antics, and lets them work it out," he said.

Honstine and his assistant, Mike Kann, complained good-naturedly about being woken each morning by the noisy birds. But it's clear from their wry observations that they view the bald eagles as engaging neighbors



A young eagle watches for mama at Raystown Lake dam.

deserving their concern and interest.

In fact, the entire Raystown staff seems to take special pride in their bald eagle family. They know of places that the eagles like to perch — on the breast of the dam or a certain fence. They observe the birds, but don't interfere in their activities.

"This is the second year we've had bald eagles nest at Raystown," said Jeff Krause, wildlife biologist, who monitors Raystown Lake's eagles. "Previous activities were primarily during winter when each year we have six to

eight bald eagles stop by to feed."

The federal government lists bald eagles as "threatened," and the state lists them as "endangered." The U.S. Army Corps of Engineers and the Pennsylvania Game Commission have taken measures to shield the eagles from human disturbance. Buoys marking a small part of the huge lake off-limits were placed from March to mid-August to keep boats out of the area below the nesting site.

Above the nest, signs along a road leading to a popular overlook warn visitors of a fine for entering the woods and disturbing the nest below.

The area surrounding the nesting site is exempt from annual gypsy moth spraying, and the military has identified it as a noise-sensitive area to reduce the impact from aircraft flying over.

Krause and fellow biologist Matthew Hoff monitor the nest with a spotting scope.

"The most exciting moment was the hatching of the third eaglet, which occurred a week later than its siblings," Krause said. He described another moment of surprise when the adults, who routinely bring fish for the eaglets' meals, delivered a Canada goose.

The cooperative efforts of the agencies and the public to enhance nesting success have been effective. All three young eagles have survived, are growing rapidly and appear to be healthy.