



U.S. Army Visual Information Center



Sarah Underhill, Soldier Systems Center, Natick



Army Transformation is a program to transition from the present-day Army to the Army of 2032. At right is a conception of a soldier in 2032 wearing form-fitting integrated body armor/chemical protection, a helmet with heads-up display and built-in communications, and armed with a multi-caliber weapon.

Future Army coming

Scott Saunders
Headquarters

The U.S. Army entered the 21st century ready to defeat any threat known in the previous century. The threat to the U.S. and her interests was simple — the enemy was the Soviet Union and the Warsaw Pact, and the mission was to prevent Communist expansion. We knew what the threat was and where it was coming from, and the Army was configured to fight a global (possibly nuclear) war.

The Cold War is over. We won.

New threats

But the world is still dangerous, perhaps more so now than during the Cold War. While the threat of global war has not dissolved entirely, our nation is now confronted with a much more complex set of perils.

The danger today comes from multiple directions as the world grapples with international terrorism, while civil and religious strife erupt in hot spots around the globe. The future Army will have to fight "asymmetric" threats — challenges that neutralize or avoid our armored firepower and air superiority. These threats include combat in cities, biological or chemical warfare, rioting mobs of unarmed (but still dangerous) civilians, and enemies who know how to manipulate computer systems, the news media, and world opinion.

The Army is transforming to meet these asymmetric threats, and USACE must also transform accordingly.

"We're still early in our planning to align ourselves to best support the transforming Army," said Brig. Gen. Steven Hawkins, the Director of Military Programs. The Chief of Engineers has delegated authority to Hawkins to manage the Corps' role in Army Transformation. "But you can be sure we'll do everything we can to ensure the Army continues to have the quality, responsive engineering support it needs to perform the mission."

The new Army

Army Transformation began with the Army Vision in 1999, and took solid form with the U.S. Army

Transformation Campaign Plan (TCP) last August. The Vision, restated in the campaign plan, reads, "Soldiers on point for the Nation, transforming the most respected Army in the world into a strategically responsive force that is dominant across the full spectrum of operations."

It envisions a:

Legacy Force— These divisions will preserve the equipment, tactics, and lessons learned in the Cold War.

Interim Force— The Army will field six-to-eight Interim Brigade Combat Teams (IBCTs). These brigades are the bridge to the future, and will gradually replace the Legacy Forces. At present two BCTs are forming at Fort Lewis, Wash. They are equipped with off-the-shelf equipment and are a lighter, faster, but still lethal force to deal with current military threats. They will also experiment to develop the tactics and equipment of the future.

Objective Force— The Army of the future, envisioned to be in place by 2032. Its composition, armament, and tactics are mostly unknown; it will evolve from lessons learned by the interim forces. In its final form, the Objective Force will be rapidly deployable, able to deal with the full range of missions from intense combat to peacekeeping, able to transition from one mission to another quickly, and able to operate in a joint, multi-national alliance.

USACE response

The TCP tasked the Corps to work with Army Material Command and Training and Doctrine Command to provide engineering service throughout the transformation. This means the Corps must *simultaneously* sustain the Legacy Forces, help the Army design and build facilities for the Interim Force, and establish the framework for Fort Future for the Objective Force.

Early this year, Corps Headquarters produced an Operations Plan for USACE Support to Army Transformation. The Commander's Intent states, "Provide appropriate engineer services to facilitate rapid implementation of Transformation while simultaneously providing top-notch engineer support to the operational (Legacy Force) Army." A USACE Transformation website with a discussion

Chief testifies before Senate on Miss. Study

By Bernard Tate
Headquarters

The Chief of Engineers is taking several actions in response to the controversy surrounding the Upper Mississippi and Illinois Study. This was the main thrust of Lt. Gen. Robert Flowers' testimony before the Subcommittee on Energy and Water Development in the U.S. Senate on Feb. 27.

"The Upper Mississippi and Illinois Study is complex, involving engineering, economic, and environmental analyses of the impact and consequences of a wide variety of possible future conditions on these rivers," Flowers said. "As you might expect, there were disagreements among the many stakeholders, as well as the team members, over the model and its projections.

"I take the issues surrounding the Corps of Engineers and the Upper Mississippi and Illinois Study seriously," Flowers continued. "I must ensure the integrity of the U.S. Army Corps of Engineers and its study process. In this regard, there are several actions underway."

Flowers listed those actions:

- The National Academy of Sciences (NAS) completed a general review of the Corps' studies process and found it to be a sound process, but the Chief of Engineers is evaluating our review process for feasibility studies to determine whether improvements, including independent review, are needed.

- Flowers cooperated fully with the NAS on its review of the Upper Mississippi and Illinois Navigation Study. He is also supporting the NAS study directed by Congress in the Water Resources Development Act of 2000 on the practicality and efficiency of independent review of feasibility studies and methods for project analysis.

- The Chief of Engineers is restructuring the management of the Upper Mississippi and Illinois Navigation Study.

- The Chief's Environmental Advisory Board is receiving renewed emphasis to insure that he receives independent environmental advice.

- On Nov. 28, the Chief of Engineers and Dr. Joseph Westphal, Assistant Secretary of the Army (Civil Works), submitted a joint memorandum to the Secretary of the Army about Civil Works Management and Communication Clarifications. In this memorandum, they agreed on the responsibilities of both parties and committed themselves to sharing information, communicating effectively, and cooperating fully on all civil works matters.

The Secretary of the Army provided copies of that memorandum to the chairman and ranking members of the subcommittee.

- The Corps' Vision Statement is being rewritten to focus on service to the Army and the nation.

- The Chief of Engineers has conducted extensive outreach sessions with a broad variety of interests, including meeting with many members of the House of Representatives and Senate.

Continued on page two

Insights

Cell phones keep people in touch (*but be careful!*)

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

Have you noticed how we are living in the middle of a cell phone invasion? Everywhere you look there are cell phones taking over our civilization, with more and more showing up every day. It seems like Americans everywhere are falling in love with their cell phone, and then the cell phone takes control of their minds.

Not long ago, I was in Springfield Mall and someone bumped into me. I turned around to see what would cause someone to walk directly into me, and I saw a young man with one of those mind-captivating cell phones pressed against the side of his head. His eyes had a far-away look, and he had an expression on his face that made me wonder if his mind and his body were residents of the same state.

He didn't apologize for bumping into me — or even acknowledge my presence. He just bounced off of me and kept on walking and talking on his phone with that distant stare in his eyes. I honestly don't believe he was aware that he had bumped into me.

I had to chuckle to myself and wonder, "How could a cell phone get such control over someone's mind that they would become oblivious to my presence — even though we actually *collided*?"

When I'm driving and another vehicle makes a crazy lane change or pulls out in front of me, I notice that the driver of the offending vehicle often has one of those cell phones clinging tightly to the side of their head, taking control of their mind. The driver will have that same

hypnotic stare in his or her eyes. Then what made me chuckle in the mall scares me when I'm on the highway.

After pondering the cell phone invasion, I became aware that it is not really the cell phones that Americans are falling in love with; it is the human contact that the cell phone makes possible. People always seem to find a "high-touch" use for every high-tech innovation. It is not the cell phone that is capturing the mind; it is the person on the other end.

Can you imagine a world where only *one* person had a cell phone? If such a world existed, that person wouldn't enjoy the phone, he or she would throw it away. Cell phones aren't to enjoy. They keep you in touch with people, and *people* bring you joy. Once again, we learn that it's not *things* that make us happy; *people* make us happy.

One morning as I looked out my window, I noticed a boy walking to school. His mother had him looking great. His pants and shirt were clean and neatly pressed, his face was clean, his hair had been carefully combed, and he looked like he was ready for his school picture. As he walked along, he was casually tossing a brand-new, shiny football into the air and catching it.

I wish I could have been there to see him when he came home, because I would have been able to tell you what kind of a day he had. If his hair was still well-groomed, his pants and shirt still wrinkle-free, and the football still shiny and new, then he had a *lousy* day. But if his hair was mussed, his shirt wrinkled, grass-stains on his knees, smudges of dirt on his face, and his football all scuffed up, then he had a *great* day. You see,



footballs are made to share.

In fact, all of life is like that. Life is made to share. The more you share and use things to build relationships, the happier you are. *Things* don't make us happy, but you can *use* things to build relationships, and it is in relationships that you find satisfaction and joy. We all need to be reminded to keep "things" and "people" in the right priority. Maybe this is why the Girl Scouts sing, "Make new friends and keep the old, One is silver and the other is gold."

Let's face it, we need each other. Maybe the person in the next cubical needs a kind word or a smile. I'll bet they do, and you're the one to give it. If we will reach out to each other and build relationships, we can make the Corps the friendliest place in America to work!

(And it's OK to use your cell phone if it will help.)

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

Army Transformation

Continued from page one

room is in the planning stages. Both internal and public access networks are planned.

Headquarters also established a Corps Transformation Task Force to define engineer requirements during the Army Transformation, match those requirements to Corps capabilities, and integrate engineering support into the transformation process.

Currently, the USACE role in the Army Transformation falls into two major areas — research and development, and installation support. Other USACE assets will also have roles to play. USACE is taking a two-pronged approach to the transformation. We are planning to execute changes in the near term to support the initial and interim forces, and also looking out to 2032 to determine final requirements for installations of the future.

Present action

The speed with which Army Transformation began meant that USACE and installation engineers did not have the normal pre-execution planning time to analyze requirements or build new facilities to support the Interim Force.

One of the first USACE transformation initiatives is to design and build a military operations in urban terrain training facility for the IBCTs at Fort Lewis. Seattle District recently turned over a Mission Support Training Facility to I Corps at Fort Lewis. It will house computerized combat simulators to support the IBCTs' tactical training.

Additional transformation construction missions are anticipated at Army installations nationwide as transfor-

mation gets fully under way.

The Corps is addressing the environmental issues of transformation by preparing a Strategic Environmental Assessment (SEA) and a Programmatic Environmental Impact Statement (PEIS). Mobile District leads this effort.

"You might think of the SEA as a 'roadmap' to show the Army the environmental issues that must be addressed during the transformation," said Don Conlon, the executive agent for the National Environmental Policy Act (NEPA) Army Support Team in the district. "The PEIS will be an environmental impact statement for the entire transformation. It's a macro-look at all the environmental issues. Once specific Army installations are identified, specific NEPA documents will be prepared for each one."

"The draft PEIS will come out in April, and a draft will be issued for public review in summer," Conlon added. "We'll probably sign a Record of Decision in October."

Fort Future

A second USACE team is looking out as far as 2032 to determine what future requirements to support transformation. Fort Future is the name given the installation study for the Objective Force, and the planning group is the Tiger Team. Their analysis takes into account facility needs like ranges and training areas, maintenance facilities, barracks, housing, and information/automation. This is a challenge, considering the changes that seem to occur daily, then to envision the world 30 years from now.

As the Army moves toward the Objective Force, there must be a paradigm shift, Hawkins said, from today's in-

stallation to Fort Future. Today's installations have clear separations between the military base and the local communities.

"The installation-community boundaries will be blurred at Fort Future," Hawkins said. He added that Fort Future will have multi-purpose, interdependent facilities and the emphasis will be on sustainable development. "And that's where USACE will play a major role, helping today's installations make the shift to Fort Future."

These fenceless installations one option the Tiger Team is considering. Other scenarios include installations largely as they exist today, and the possibility that installations may be even *more* self-contained and independent.

Supporting today's Army

Meanwhile, USACE Transformation planners work closely with the Army staff and other MACOMs to ensure the Corps' transformation efforts coincide with Army-wide initiatives. USACE divisions have people designated to work Army Transformation issues, and to ensure that Army planners are tapping into USACE resources.

The Corps' Transformation Mission Statement aligns closely with our everyday goals — "Support Army Transformation through professional, cost-effective, and timely engineer support across the full spectrum of operations."

"It's important to continue to provide quality support to our current force," Hawkins said. "We just have to make sure we're prepared to move out quickly, since we're the ones designing and building the force-projection facilities that the Army will need in the 21st century and beyond."

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Commentary

Let's put the "E" back in USACE

Jim Moore
Baltimore District

Are engineers still the primary strength of the Corps? This question is not intended to exclude non-engineers; it is simply the premise for some self-examination. There is increasing turn-over, a decrease in people who see the Corps as a lifelong commitment, an absence of *esprit de corps*, and a decline of the engineer culture. I believe the reason may be a lack of focus on our core competencies — engineered planning, design, construction, and operation of public works projects for our nation and our military.

After 225 years, the Corps is still a valuable national asset. But it may be time for us to decide what we "want to be when we grow up," and to define those features that differentiate us.

Each time we take on a project with less than full engineering review, allow a product to be produced at less than Corps standards, speak ill of another Corps element in earshot of customers, and each time we place our personal (or section, or division, or district) interest ahead of the customer's, we contribute to a decline in the "way the Corps of Engineers does things."

Some argue that customers will no longer pay for "the Corps Way," and contend that we should do whatever customers want, even if it means skipping steps we used to insist on. I argue that we must *insist* on quality, and assist our customers to understand why that is necessary.

Business

Why is it important to maintain this high standard? Beyond ethical considerations, it is a matter of business and economy. The reason we exist, and the reason we obtained business in the past, is because we are unique in our composition, and unique in the products we offer. We are a group of engineers with the ability to procure, manage, and administer public funds to build projects that fall within the public domain. We can employ private contractors, but we retain overall responsibility for the projects.

To do this, we maintain a strong cadre of professional engineers. That, and that *alone*, differentiates us from other agencies, and from private firms who are cited as our competition.

Strong contracting/procurement capability and sound project management business processes (PMBP) are important, but they are not our core competencies. It is not possible for us to compete with other agencies that do not maintain an engineering cadre, or for them to compete with us. Private firms cannot claim the same capabilities, since none of them have the same public responsibility. No one else carries the burden of being the nation's engineer, with ties to both the military and civilian sectors. No other agency has our breadth of programs and talent; no private firm has our diversity of missions.

Do all of these unique features cost more money? You bet! But a well-informed customer, the Congress, and the public will recognize that our value added far exceeds those costs.

We often advertise our skills in management, contracting/procurement, and even financial management, while down-playing our role as engineers. Why would our customers choose their planner/designer/builder based on those capabilities? If you were choosing a hospital to perform heart bypass surgery, would you ask how well they balance their books, or about their automated systems?

Of course not. You would ask about the skill and past performance of the surgeon, and this hospital's success rate in this procedure. While cost might be a consideration, it would run a distant second to your medical questions.



Similarly, our customers gravitate toward us because we have engineering skills, not because we can project exactly when their last dime will be spent.

Challenges

A number of challenges face our technical elements (engineering, construction, and so on). These challenges may, in part, be responsible for the management-over-engineering emphasis:

- Skyrocketing overhead rates fueled by costs not directly attributable to projects or programs. Some of the most expensive items are Corps-specific information technology systems which are not necessary to perform our technical functions, and not considered value added by customers. There are many commercial substitutes for these systems; they need not be created or maintained by the Corps.

- A lack of balance in assigning costs to projects, programs, and customers. Customers notice who gets the most attention. Some of our best "reimbursable" customers believe their funds are cross-subsidizing the high attention that our "flat rate" military customers get. If we are to operate efficiently, we should fairly charge all customers their relevant costs. We should identify and eliminate all non-value added costs, not bury them in our overhead structure or a labor multiplier.

- Erosion of our leadership in design and construction. Our models, specifications, and operating procedures are no longer the benchmark of the industry. Our standing continues to diminish, even as others come to recognize the value of a uniform, coordinated set of values.

- The way some in USACE and DoD view us — not as the premier agency for federal infrastructure, but as an agency on the ropes. An expensive alternative to private contracting, something to be reorganized and fixed. Actually, we have many practitioners who know their business well.

- Our performance metrics should measure value as perceived by our customers. As presently structured, they only allow our Headquarters and major subordinate commands to gauge the speed at which we obligate and expend funds. This may be a good way to measure performance at the Office of the Secretary of Defense, but it has little to do with delivering high-value engi-

neering services.

- While we have made numerous organization and name changes, we have not identified and segregated the management practices which are unique to the PMBP, and assigned them to a project manager. The underlying premise and value of PMBP is to consolidate those practices in an accountable, responsible individual. We have not eliminated the duplication of management, or learned to share information, funds, and efforts across functional lines.

- As our numbers and influence decrease, our tendency to hide behind an architect-engineer design or a contractor-produced product increases. Our relationship with these parties does not diminish our responsibility as project integrators. In fact, such behavior *infuriates* our customers.

Engineer pride

So is a resurgence of engineering pride the answer? Some recent experiences and research might lead us to that conclusion, and to hope that the pendulum may be swinging back:

Kosovo — Not long ago, a Corps contingent deployed to Kosovo with the peacekeeping force. Initially, our role was not clear, and changed rapidly as the situation escalated. Ultimately, we were tasked to create base camps for 7,000 soldiers in less than four months.

We used the engineering talent of the Corps and the Engineer Regiment to accomplish that mission. We did not have direct control over the thousands of soldier-engineers, their equipment, the material, or other resources. We *did* have the engineering expertise to quickly assess the situation, prepare the necessary plans, and immediately implement them.

Customer satisfaction — Recently I completed a thesis (*Selecting and Evaluating Management System Metrics: An Analysis of Project Management in the U.S. Army Corps of Engineers*). The research found a strong positive correlation between customer satisfaction and quality, cost, and schedule, in that order.

New Chief — Our new Chief of Engineers, Lt. Gen. Robert Flowers, recently visited Baltimore District and expressed a clear understanding of the challenges in identifying and supporting our engineering core competencies. He is also moving the Engineering and Construction Division from Fort Belvoir, Va., into Corps Headquarters, and is planning other strategic actions to elevate the importance of the engineering community in the Corps.

Core competency

Based on the above, I believe Corps-wide retro-reinvention is in order. *Engineering* is what we do best; it is our history, our core competency, and our legacy. It should be the attribute we showcase to our customers, the Congress, and the taxpayers.

The project management business process is the way we manage and deliver engineering services and products; contracts are simply one tool we use in that process; our organization, performance metrics, and information systems should be structured to support *engineering* efforts. The value of our efforts should be determined in the context of the profession(s) which govern them, and measured by the customers who receive them.

In short, we are *engineers*. We provide *engineering* services and products. It's time to reclaim the legacy of the U.S. Army Corps of *Engineers!*

(Jim Moore is the resident engineer of the Northeastern Resident Office at Baltimore District.)

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

Ice and snow

Christmas storm brings damage, emergency missions

By Susan Satterfield
Tulsa District

December 25 and the days following will be a Christmas to remember. A destructive ice storm, covering more than 450 miles, left 32 Oklahoma counties damaged enough to be declared disaster areas. Tulsa District projects were not left out of the chaos.

Damage assessment is still underway, and the list of damages is increasing. At this point, damage to Tulsa District projects is estimated at \$12-15 million, according to Stan Spirlock, outdoor recreation planner in Operations Division.

"New situations, such as waterline breaks, are still occurring but, hopefully, we're getting close to completing the assessment," Spirlock said. "There's a considerable amount of damage to boundary line fences, power lines, recreational sites, and waterlines.

"One of the first tasks we must complete is cleaning up the large amount of tree debris," Spirlock added. Eufaula Project is one example of that destruction. An assessment of recreation areas there concluded that 4,980 trees were damaged in 11 parks.

Repair work began as early as midnight on Christmas and it continues throughout the affected areas of the district. The Eufaula Project Office was without electricity for 10 days, and all personnel had



Children in McAlester, Okla., use a homemade sled to pull water home during the blizzard. Tulsa District's Readiness Team provided the water. (Photo courtesy of Tulsa District)

to be relocated to the powerhouse until electricity was restored.

Winter volunteers also suffered through the storm. "Many of the volunteers were left stranded in the parks with no service for days, and all they could do was listen to the frightening sound of

limbs popping and raining down all around them," said Mike Dumford, a park ranger at Eufaula.

Park ranger Jeff Paskin and maintenance worker Terry Teague from Pat Mayse Lake, spent Dec. 26-28 clearing trees and debris from the roads, com-

pound, and parking areas. They made necessary repairs to water hydrants and cleared debris from camping areas while working without any electrical, telephone, or water services.

The Tulsa District office was also tasked with emergency response work. The Readiness Team got a mission to deliver 500,000 gallons of bottled water (later cut to 250,000 gallons) to the Muskogee, McAlester, Poteau, and Idabel National Guard armories. Tish Livesay from Wister Lake Office, Paul Bisdorf of Engineering and Construction Division, Sue Morris and Tim Hunt from Logistics, and Richard Freeman of Real Estate Division volunteered to help deliver the water.

Tom Logsdon, Chief of Military Branch in the district's Programs and Project Management Division, helped provide technical assistance to Oklahoma about Federal Emergency Management Agency generators the state deployed to various public utilities. Soldiers from Fort Lewis, Wash., also assisted with installing the generators.

Clean up and repair work continues throughout Tulsa District. Many employees at the projects gave up their holiday time and risked the dangers of the storm to help repair, clean up, and check on fellow employees. They won't soon forget the Christmas storm of 2000 and the ice-covered New Year of 2001.

NAD takes part in anti-terrorism exercise

By Lou Fioto
North Atlantic Division

North Atlantic Division (NAD) headquarters recently participated in an AntiTerrorism/Force Protection exercise at Fort Hamilton, N.Y., the installation where it is located, tested its ability to respond to a serious incident.

Vigilance

"To heighten public awareness of potential terrorism and to test each organization's response capability, the Department of the Army ordered installations worldwide to conduct similar exercises," said Raymond Aalbue, Public Affairs Officer for the garrison. "No particular threat currently exists, so members of the community should not be alarmed by the exercise.

However, residents, visitors, and the workforce should maintain a reasonable level of vigilance at all times," Aalbue added. "Such vigilance should include notifying the military police immediately if you notice anything out of the ordinary, such as unusual packages, items out of place, or people loitering or behaving strangely."

In a genuine crisis, Fort Hamilton must rely on the assistance of the New York City (NYC) Police and Fire departments. Aalbue added, "it was a very important test of our response to a serious incident. The garrison staff performed very well and our interaction with the local police and fire units was outstanding."

Besides the police and fire department, the exercise involved the military police; the FBI, the Bureau of Alcohol, Tobacco and Firearms; the Department of Public Works; the base commander; the local press; and the occupants of Bldg. 301. (NAD is located in Bldgs. 301

and 302 at Fort Hamilton).

"This was an excellent test of the base's ability to handle an emergency situation," said Col. Gregory Bean, NAD Deputy Commander, which occupies a large portion of Bldg. 301. "The response of the various agencies involved was smooth and professional. We're in good hands."

The scenario featured a hypothetical bomb placed in or near Bldg. 301. Players in the exercise executed a variety of emergency response procedures, including evacuating people from the building, explosives detection and disarming/removal, and counter-terrorist maneuvers.

"The exercise, a yearly requirement, gives all the participants (federal, state, and local) a good understanding of how prepared they are to react to an actual incident such as that simulated," said Gary Kehoe, NAD's Chief of Security and Law Enforcement. "This is especially important where members of the participating agencies are routinely transferred to new assignments. Exercises such as these allow the new members of these agencies to develop a rapport with their counterparts and get a good feeling for things if an actual incident occurs."

Taken seriously

"As the only major Army installation in the NYC area, we have to take the threat of a terrorist attack seriously," said Lt. Col. Fred Kropp, NAD's Plans and Operations Officer. "By preparing plans and conducting realistic exercises involving numerous law enforcement agencies and other emergency personnel, we send a message of deterrence to those that would attempt to cause us harm. The message is that Fort Hamilton is ready, willing, and able to respond, with the appropriate level of force, to any attack against us."



A soldier puts on full chemical protective gear during the Anti-Terrorism/Force Protection exercise at Fort Hamilton, N.Y. (Photo courtesy of North Atlantic Division)

Regional board tackles intracoastal waterway management challenge

South Atlantic Division's Regional Management Board is tackling a civil works challenge that has existed for years and impacts four Corps districts along the lower portion of the Atlantic Intracoastal Waterway (AIWW).

The challenge is actually a whole set of questions:

- How can we insure that the AIWW is maintained at standard depth along contiguous stretches and ignore district boundaries in the process?
- Are the real needs of the waterway users being addressed?
- Are we effectively using resources to assure passage along the AIWW?
- How can we integrate condition surveys into the project management business process to address critical shoaling problems?

AIWW history

In the River and Harbors Act of 1874, Congress appropriated \$10,000 to improve the mouth of the St. Johns River and perform inside dredging along the passage between St. Johns River and Nassau Inlet.

During the 1890s, Congress became interested in taking advantage of the bays, inlets, and tidal creeks by using dredge cuts to provide a natural inside water passage for commerce. This project grew incrementally until Congress recognized it as one project and named it the Atlantic Intracoastal Waterway (AIWW).

Currently, the AIWW is a 740-mile navigation channel that extends from Norfolk, Va., to Fernandina, Fla., where it connects to the Florida Inland Waterway that extends down to the Florida Keys.

During recent years, South Atlantic Division (SAD) has averaged spending more than \$12 million a year in maintenance dredging of the AIWW. Each district maintains the segment of the Atlantic Intracoastal Waterway within its jurisdiction. Although the AIWW has an authorized navigable depth of 12 feet, it is actually maintained at depths ranging from seven to 12 feet.

These are the states the AIWW passes through and the depth normally maintained:

- Virginia — 12 feet
- North Carolina — 10 feet
- South Carolina — 9-11 feet
- Georgia — 8-10 feet
- Florida — 7 feet

Stakeholder ideas

In July 1999, a group of East Coast waterway users formed the Atlantic Intracoastal Waterway Association (AIWA). Their stated purpose is "to encourage the continuation and further development of waterborne commerce and recreation in the intracoastal waterways of Virginia, North Carolina, South Carolina, Georgia, and Florida."

The AIWA held their first meeting in Savannah, Ga., in November 1999 to address a growing number of user issues, including insufficient dredging funds needed to maintain the entire length of the AIWW down to the congressional project authorization of 12 feet. And the U.S. Army Corps of Engineers realized we needed to review our business practices to better serve AIWW stakeholders.

In June, a representative from the navigation branch of each district along the AIWW met to determine how they could better serve the users along the AIWW, better use the dredging resources available, and best determine a justified level of service at the least cost.

One idea discussed was to group work geographically rather than by district boundaries. This could entail several smaller dredging contracts that are logically grouped. Instituting this concept would likely lower the cost to the taxpayer and would aid in the comprehensive manage-



The Atlantic Intracoastal Waterway carries a great deal of commerce down the East Coast. (Photo by Jonas Jordan, Savannah District)



Vessels of all types use the Atlantic Intracoastal Waterway, from sailing ships to fishing boats. (Photos by Jonas Jordan, Savannah District)



ment of the Atlantic Intracoastal Waterway. SAD is pursuing this concept.

The next logical steps would be to determine the most heavily trafficked sections of the waterway, calculate the benefits from commercial navigation, and verify that dredging was focused on these areas.

Savannah District is conducting an initial appraisal investigation to evaluate these ideas, under the authority of Section 216 of the 1970 River and Harbor Act. This law allows the Corps to review the operation of Corps projects and to recommend modifications. The initial appraisal will be used to justify and document the need for a feasibility study for improvements. The feasibility study would require specific congressional funding.

Board meeting

SAD's Regional Management Board (RMB) met last July to address AIWW issues and develop an overall management strategy. The RMB proposed using the project management business process, and appointing a single project manager to unify the approach.

The RMB recommended that this project manager coordinate all work along the Atlantic Intracoastal Waterway, including immediate initiatives aimed at better operation and maintenance, and the long-term Section 216 feasibility study. SAD's resources would be available for this effort.

The RMB envisioned that the project manager would be stationed in a district, but would act on behalf of the entire SAD Regional Business Center. He would report

to the Division Project Review Board on technical aspects, and to the Division Regional Management Board on business process issues.

The individual nominated, the RMB felt, must be available long-term, understand and practice the project management business process, possess experience in navigation, and have the managerial ability to unify everything needed to meet public needs along with the Atlantic Intracoastal Waterway.

The RMB concluded that the project manager would receive letter input for his performance appraisal from the Board.

Project manager

The RMB selected Wilmington District to provide the project manager for the AIWW coordinated effort. The board selected the district because it has the most investment in the AIWW. The district selected Al Bjorkquist of their staff as the project manager for the AIWW regional effort.

These efforts, sparked by SAD's Regional Management Board, will help resolve on-going management challenges on the lower portion of the AIWW. As the evolution toward a fully-integrated Regional Business Center gains momentum, our customers can expect to see similar initiatives in the future.

(Bill Lynch, Chief of Resource Management in Mobile District, and Al Bjorkquist, Wilmington District's Atlantic Intracoastal Waterway project manager, both contributed to this article.)

Modern materials replace siphon

Article and Photos
By Alexander Kufel
Honolulu District

After 85 years of service carrying billions of gallons of water for agricultural use, gigantic redwood "siphons" in the countryside near Honolulu will soon be replaced by space-age materials that proved their worth in the deserts of the American West.

The siphons help carry water of Hawaii's 26-mile-long Waiahole Water System across gulches and valleys on Oahu, the "Big Island" of Hawaii.

Old materials

The sections receiving attention include three five-foot interior diameter siphons that are each about a quarter-mile long and made of four-and-a-half-inch thick redwood staves banded together in traditional cooperage fashion. They will be replaced by sets of 40-foot sections of 38-inch interior diameter high-density polyethylene (HDPE) that were designed by Honolulu Engineer District (HED).

The HDPE tubing will be heat welded together on site to form a continuous tube. Delta Construction was awarded the \$1 million contract. HED civil engineer Glenn Kusaka of the Fort Shafter Resident Office is inspecting the construction project with assistance from hydraulic engineer Lincoln Gayagas. Kusaka also will be training state personnel in construction management techniques.

Because of the fragile nature of the produce irrigated by this system, which dictates that the area cannot be without water for more than three days at a time, the project will be staged to minimize dewatering of the existing siphons.

Grateful

Bert Hatton, a board member of Hawaii's Agribusiness Development Corporation, said that they were grateful for the Corps' involvement in the project since the resulting design saved the state "a whole bunch of money."

HED hydraulic engineer Jim Pennaz, who was the project manager during the design phase, said that the state invited Corps to provide a solution to aging siphons that were becoming prohibitively



Hydraulic engineer Jim Pennaz stands near a stack of high-density polyethylene pipe designed by Honolulu District.



A close-up photo of the siphon shows the cooperage techniques used to build it. It was built between 1913 and 1916.



The 85-year-old siphon leaks more than a million gallons of water a day. It was built of redwood using traditional cooperage techniques, and it carries 5-13 million gallons of water per day across 26 miles of dry country in Hawaii.

expensive to maintain. They were leaking several million gallons of water a day in a system that presently carries 5-13 million gallons per day.

New materials

Former sugarcane lands are currently being developed for use in diversified agriculture. Pennaz said that they looked at the HDPE material because of its toughness, low maintenance, and economy as well as its resistance to deterioration from ultraviolet rays.

Civil engineer Norman Kaneshige, and structural engineer Ivan Awa, worked together with Pennaz to prepare construction plans and specifications.

The wooden siphon replacement project was dedicated on Jan. 5.

For Hawaii's Agribusiness Development Corporation, in conjunction with Waiahole Water System, maintaining that system is central to growing veg-

etables in the area. According to state archives, at its peak, irrigation systems diverted an average of 35 million gallons of surface water daily to more than 4,000 acres of Oahu land planted in sugarcane. Currently, the daily flow rate is at seven million gallons.

Ingenuity

A siphon is an ingenious application of hydraulic physics. Gravity flow fills the siphons at the high end of a gulch, carry the water along the floor, then climb the opposite side until it is once again flowing on flat land.

Pennaz said the real engineering occurred in the early 1900s when someone conceived of the idea of carrying water 26 miles from its source through a system of tunnels, ditches, and siphons. Just one engineering marvel was applying wooden barrel cooperage techniques to create large-capacity siphons instead of

towering trestles crossing Hawaii's notoriously steep gulches.

"The obstacles seem almost insurmountable," said Pennaz. To accomplish it they bored 15 miles of tunnels through the mountains, built seven siphons (three of redwood and four metal lined with concrete) plus nine water storage dams and reservoirs to help with staging the water to facilitate a continuous flow.

When one considers the era when this took place (the ditches and tunnels were built from 1913-16), the isolation of the Hawaiian Islands at that time, and the enormous volume of water employed at its peak, "the resulting engineering is phenomenal," Pennaz said.

The four steel siphons currently are not leaking water, but are slated for a comprehensive inspection as part of an ongoing maintenance program by the Waiahole Water System, possibly augmented by \$2 million in federal funds and conducted by HED.



Building Tomorrow's Army

Corps labs designing Army future

Imagine that it is 1900. World War I is still 14 years in the future. The tank, the airplane, and the computer haven't been invented. The automobile is still a rich man's toy.

Yet you are assigned to imagine the Army of 1932.

That is the challenge of the Army Transformation, to design the Army of 2032.

But imagining and designing the future has always been the specialty of the Engineer Research and Development Center (ERDC). Its laboratories are already working to support the Army Transformation.

Base-camp protection

Even today, soldiers must deploy anywhere in the world and live in hostile areas. Army Transformation envisions that such deployments will be more common by 2032.

The Base Camp Survivability research program will help make base camps as safe as possible. While full funding of is on the horizon, engineers in the Geotechnical and Structures Laboratory are assisting troops in the field now.

"We've been involved with force protection, field fortifications, and other protection research for decades. This research will build on a whole range of protective measures and research," said Pam Kinnebrew, who manages the Force Protection on the Battlefield Program, from which Base Camp Survivability research will evolve.

Base camps, like those in Bosnia and Kosovo, are temporary, quickly built military camps for humanitarian and peacekeeping operations and low-intensity conflicts.

"Base camps usually start with tents, and then build up to SEA huts," said Kinnebrew. (SEA stands for Southeast Asia huts, originally designed for use in Vietnam.) "We need to provide protection in all phases of build-up, construction, and operation of base camps. This research will provide a planning capability for building base camps in the future.

"We will also develop improved, low-cost, lightweight protective measures," Kinnebrew added. "These new protective materials and technologies will increase survivability more than 30 percent and reduce logistics requirements by 20 percent."

According to Kinnebrew, ERDC first saw the need for base camp support during a field exercise with the 101st Airborne Division at Fort Campbell, Ky.

"We were there to demonstrate our Antiterrorism Planner (a computer program for threat assessment and survivability planning)," said Kinnebrew. "They said, 'This is great. But with our missions, what we *really* need is this, this, and this.'"

The Geotechnical and Structures Laboratory started looking at how to improve the survivability of base camps and similar expedient construction.

"We're looking at a variety of new materials, such as Very High Strength Concrete, which was developed at the Waterways Experiment Station several years ago," said Kinnebrew. "Panels built of this concrete provide ballistic protection that is great for logistics and supply areas. You can replace thick concrete walls with three-inch-thick VHSC panels. You can build a sandwich with the panels and fill the middle with sand to provide enhanced troop protection for SEA huts or other troop quarters."

Other innovative materials are being examined. Linex, commonly used to spray-in pickup truck bed-liners, can be sprayed on various new materials to increase longevity. Ballistic fabrics, ultraviolet curable resins, and other materials are being researched to provide protection for SEA huts and other base camp structures.

"Our research efforts include using different levels of numerical models, lab experiments, such as the Projectile Penetration Facility, and field experiments, such as those conducted last year at the Joint Readiness Training Center at Fort Polk, La.," said Kinnebrew. "In field experiments, we see if soldiers can build these structures with our new materials and designs."

The new protective technologies and materials being researched for military applications will also be made available to the private sector. This will provide increased protection from terrorist threats to civilian buildings.

The Base Camp Survivability Program is not scheduled to receive funding until fiscal year 2003 (FY03). But when our forces call for help, ERDC is always willing.

"Through the TeleEngineering Operations Center, we've gotten numerous requests for assistance for base camp support, and some funding to act on these requests," said Kinnebrew. "One request involved soldiers wanting to bury international shipping containers for protective positions and shelters. We did evaluations and provided procedures to brace the container so it wouldn't collapse."

Rapid airfield construction

One goal of Army Transformation is to move a brigade anywhere in the world in 96 hours, followed by a division in 120 hours, and five divisions in 30 days. This requires good airfields, and one of ERDC's missions is to develop tools for engineer soldiers to support aircraft operations in remote regions.

"Joint Rapid Airfield Construction (JRAC) is an extension of airfields and pavements research, lines of communication, and other advanced technologies we've been working on for years in the Geotechnical and Structures Laboratory," said Dr. Bill Grogan, JRAC project manager. "In future wars or peacekeeping operations, we must get our equipment and personnel into unknown locations quickly and safely. Many locations won't have major airports, so we'll have to build safe airfields, and build them fast."

Rapid airfield construction has three basic components. Each aids engineer soldiers in building contingency airfields.

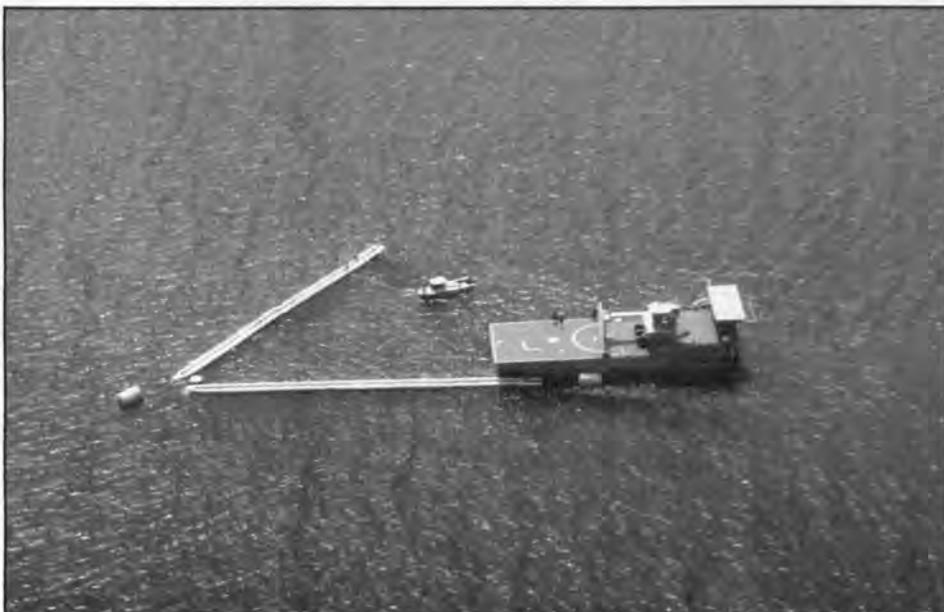
Site selection. Many things must be considered when selecting a site for rapid airfield construction. The JRAC site selection procedure considers strategic and tactical information, infrastructure, construction effort, and other factors, and develops a list of candidate sites. The commander can review these factors and select a site.

Rapid earthmoving. JRAC uses construction equipment outfitted with advanced technologies that combine design, planning, and earthmoving operations with real-time information from radio communications. This technology allows unique capabilities, such as night operations without lighting, and eliminates manual surveying, which speeds up earthmoving speed by 30 percent or more.

Rapid surface stabilization. When the airfield is brought to final grade, it needs a surface that will sustain operations with minimal maintenance. Rapid surface stabilization, like sand fiber or matting, lets the mission continue with minimal regular maintenance or reconstruction during operations.

In March, the 20th Engineer Brigade will conduct a JRAC experiment at Fort Bragg, N.C., to showcase an Enhanced

Continued on page eight



A scale model of the Rapidly Installed Breakwater undergoes tests off the coast of Florida. (Photo courtesy of the Coastal and Hydraulics Laboratory)



An artist's conception of how a full-sized Rapidly Installed Breakwater would look and operate. (Graphic courtesy of the Coastal and Hydraulic Laboratory)

Corps labs

Continued from page seven

Earthmoving Capability (EEC) system. This experimental EEC system uses a global positioning system (GPS), a computer-aided design model for project design and planning, on-board electronics, and high-speed wireless communications. The radio communicates with a control location and links with the GPS system to obtain position accuracy within an inch. This lets the equipment operator view a screen to see where he is on the site. It also provides information like where cuts and fill material are needed, and where the site is at proper grade.

The JRAC program, although recognized as a much-needed technology, has been largely unfunded until recently. Program managers recently learned the program will be funded from FY03 to FY07 for about \$16.5 million.

Rapidly Installed Breakwater

The deployment goals of the Army of the future will be a herculean task. Aircraft will likely deliver the entire first brigade and initial division. Personnel of following units will also fly, but their equipment will likely travel by ship.

Since deep-draft ports will probably be denied, damaged, or non-existent, these ships will unload offshore and the equipment will move to the beach on smaller vessels. These operations are called Joint Logistics Over the Shore (JLOTS).

But JLOTS operations are adversely affected by rough sea, and essentially halted by waves higher than three feet (SeaState 3). Since waves this size typically occur more than 50 percent of the time worldwide, they are a serious threat to U.S. force projection.

"The problem has been called a 'war stopper,'" said Dr. Jimmy Fowler. "The requirement is to knock waves down by 50 percent, from waves three-to-five feet high to only one-to-three feet."

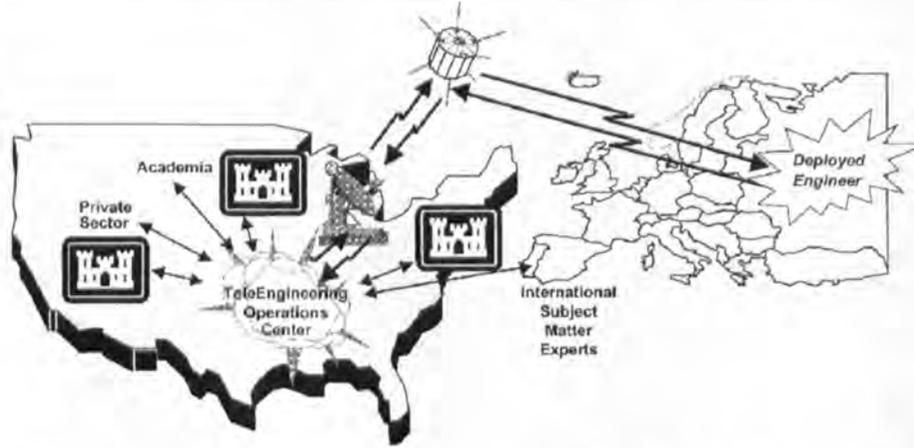
Add requirements to have the device operational within 48 hours of arrival, and able to survive waves up to 20 feet high, and the answer gets even harder.

So the Coastal and Hydraulics Laboratory is developing a Rapidly Installed Breakwater (RIB). The RIB concept is a floating V-shaped breakwater that deflects waves, providing calm conditions inside the V for JLOTS operations.

Fowler is the RIB Advanced Technology Demonstration Manager. "It seems relatively easy, but think how big the structure must be — about 1,000 feet long for each leg. It has to penetrate the water about 30 feet deep. You have to be able to ship it, then assemble it quickly, and it has to survive in much larger waves."

RIB research started in 1995 with scale model tests. Laboratory experiments were conducted on various RIB versions to improve performance or refine the design. Besides lab studies, four field demonstrations of various "hard" and "soft" RIB designs were conducted on the East and Gulf coasts. The latest version, the RIB XM-2000, was deployed at Pensacola, Fla., for

TeleEngineering Concept



five weeks in 2000.

"Every RIB we've tested in the field reduced waves in the Sea State 3 category by 50 percent or more," said Fowler. "The XM-2000 actually reduced some waves by about 70 percent."

Researchers learned many lessons during the research and field deployments. They began with a hard component design, but determined that only a "soft" design would meet the RIB requirements. The XM-2000 was built in one-quarter scale from high-strength marine fabrics. The 150-

foot-long tubular legs were pressurized with seawater for the required stiffness. Completely filled, the legs were about six feet in diameter. Air was pumped into long floatation tubes on the top of each leg to provide necessary free-board (height from

the water to the top of the tubes).

The filled RIB sections are somewhat like long, soft icebergs — most of the structure is underwater.

The XM-2000 RIB featured two major improvements. The first was a mooring system with more efficient anchors, and new materials for the mooring lines. These can absorb up to 90 percent of impact on the RIB caused by ship contact or rough waves. It also allows much steeper mooring line angles, which will help ships avoid the mooring lines that secure the RIB.

The other new feature was a non-mechanical, seamless joint connecting the RIB sections. Consisting of high-strength, low-stretch Kevlar straps that ran the length of each RIB section, it worked well, but future designs will be improved with extra webbing and improved strap materials.

Tests with the XM-2000 evaluated potential methods to anchor or attach a vessel for best off-loading and RIB performance, using input from ships' captains and placement of actual vessels.

Another field demonstration using full-scale RIB segments will be conducted early next summer to refine the joint and its connection. Two 200-foot-long RIB segments will be tested near Cape Canaveral. The month-long test will first have the segments linked by the new joint into one 400-foot leg. Then the RIB segments will be

reconfigured into the V-shape to further document wave reduction.

"We need to finalize the joint, and answer questions about transportability and strength of the hull," said Fowler. "In 2002 we will test the RIB at near full-length, hopefully during a military exercise."

There is widespread interest in the RIB for commercial use. ERDC researchers have patented the original design and are processing patents on improvements.

"A smaller RIB could protect a diver support vessel for an aircraft crash or vessel recovery operation," said Fowler. "A RIB could also be used in jetty or bridge construction, or to protect a damaged breakwater at a harbor."

TeleEngineering

New communications systems will give soldiers in 2032 unparalleled sources of information and help. One of those systems is operational now.

TeleEngineering is a technology demonstration conducted by ERDC under the propanency of the U.S. Army Maneuver Support Center. When soldiers encounter a complex field problem, they can quickly reach back via advanced communications to the TeleEngineering Operations Center. The center taps the expertise of the Corps' labs, districts, divisions, private industry, and academia for answers.

While the name is fairly new, the basic concept is a cornerstone of Corps service.

"We've always had TeleEngineering, we just didn't call it that," said Dr. Larry Lynch, the research and development program manager for TeleEngineering. "The Corps' research laboratories have provided one-stop R&D services to the military for years; help was just a phone call away. But advances in communications (cell phones, video teleconferencing, and secure satellite links) let us communicate directly with people on-site, and gave us direct connectivity to subject matter experts."

The concept got its start in Bosnia as soldiers learned that they could contact a wealth of technical knowledge across the globe to quickly provide answers. Engineering support to Bosnia included flood stage predictions, base camp construction, road repair, soil stabilization, and other areas. Digital photography gave views of specific problems and helped experts in the U.S. provide workable solutions.

The Maneuver Support Center realized the potential, and the TeleEngineering

Operations Technology Demonstration began about two years ago.

The TeleEngineering Operations Center is in Vicksburg, Miss.

"We're still in the development stages," said Lynch. "The Operations Center mission is both research and operations. Operations is helping us understand what is required on the research end to provide rapid, accurate engineering analysis."

Developing doctrine and protocols (how requests for information are submitted, who can submit, and the best way to respond) is ongoing. The total operational status and future funding of the Operations Center are also being developed.

"One thing we've determined is that hardware should never limit access," said Lynch. "Communications is the link to our experts and ultimately to the answer."

Working 24 hours a day, the TeleEngineering Operations Center supports long-range planning requests, warfighter exercises, and soldiers in the field across the globe.

Business has been good. In FY00, the center responded to more than 700 requests for assistance. Troops in Kosovo needed assistance with supply routes, soil stabilization, force protection, and bridge assessments. A Corps team in Africa needed large dam assessments due to flooding. Commands need freeze analysis for lakes and reservoirs. Warfighter exercises need terrain analysis and modeling information.

The TeleEngineering Operations Center is the clearinghouse for such requests and assistance. "We interface between the green-suit Army and the white-coat researchers," said Lynch. "Researchers tend to give a lot more detail on how they determined the answer. The warfighter just wants the answer, and he wants it now."

TeleEngineering can also support other branches of the armed forces. "We've supported the Navy and Marines in amphibious assault operations planning," said Lynch. "We've supported the Air Force in airfield repair and dust control."

Steps are under way to improve TeleEngineering operations. Investigative and reconnaissance equipment packages are under development to help deployed engineer forces gather data needed by the subject matter experts to provide the best decisions. These range from simple field devices that gather data on soil strengths to sophisticated tools like the Urban Robot.

Other improvements include the TeleEngineering Tool Kit, a software package that aids the field engineer in determining exactly what he needs to request, and provides it in the proper visual format (digital photos or video, graphs, or maps). This also helps the subject matter expert respond to the question, and prompts additional responses in potential related problem areas. Version 1.1 was recently released.

Joint Virtual Battlespace

Before the vehicles, weapons, and tactics of the Army Transformation move or shoot in the real world, they will first go through their paces in cyberspace.

"The Joint Virtual Battlespace (JVB) is a virtual proving ground for concepts," said Dr. Ed Link, Director of Research and Development. "You might say that we're

Continued on next page

Army



Transformation



Fort Lewis soldiers inspect the Light Armored Vehicle which will be the mainstay of the new Initial Brigade Combat Teams. Two IBCTs are currently forming at Fort Lewis, Wash. (Photo by Jan Marcan, Seattle District)



A Light Armored Vehicle in the field on combat maneuvers. This version is the LAV-25, with a 25mm Bushmaster cannon mounted in a revolving turret. (Photo courtesy of the U.S. Army Visual Information Center)

Transformation begins at Ft. Lewis

By Jan Marcan
Seattle District

Worldwide Army Transformation begins at Fort Lewis, Wash., and in Seattle District.

At the top of priorities this year is the district's and Northwestern Division's support to the transformation initiative.

Seattle District moved aggressively last year to coordinate project designs with the Fort Lewis Directorate of Public Works team and Initial Brigade Combat Team (IBCT) program proponents. Design charrettes and the value engineering process were used to fast-track design development on this important program. Both architect-engineer and in-house project development teams were part of the effort.

"We're honored to be together with Fort Lewis at the leading edge of Army Transformation," said Col. Ralph Graves, Seattle District commander. "It's a challenge

to deliver these projects on time and ensure that they prove the best support to the new formation. It's also good news that the Army recognizes that force modernization also requires facilities modernization."

Seattle has elected to advertise more than half of the program as design-build construction projects early in the fourth quarter, subject to availability of funds since congressional approval of funding takes place later in the year. Program manager Jim Clark emphasizes the critical need to quickly turn over this infrastructure work, which will sustain the Army's new brigade conversion. "Hopefully, this will enable us to award in October, three to four months early," said Clark.

In Oct. 1999 Gen. Eric Shinseki, Army Chief of Staff, announced the Army Transformation initiative, and selected two brigades at Fort Lewis to transition to IBCTs.

"Brigade conversion is a milestone on

the road to transforming the entire Army into a force that is strategically responsive and dominant at every point on the spectrum of operations," Shinseki said. "The transformation of these two brigades at Fort Lewis, using current off-the-shelf technology, will give us an interim capability as we move toward our long-term goal of the objective force." (The objective force is the Army envisioned for 2032.)

An IBCT will have 3,500 soldiers organized in six battalions equipped with the light armored vehicle. The plans are for the Army to be able to send the force or any portion of it anywhere in the world within 96 hours, ready to fight on arrival.

The bulk of new Fort Lewis facilities' requirements fall into three types, said Clark:

Stationing— Housing and maintenance facilities to support the new force structure.

Training— Ranges and training facilities to prepare and support the combat

teams.

Deployment— Improvements in facilities needed to satisfy the power projection mission by inspecting and processing vehicles, munitions, cargo, and supplies to support sustained operations.

Eight IBCT projects are programmed for fiscal year 2002. They are two vehicle maintenance facilities, barracks, a combat vehicle trail, ammunition supply point expansion, deployment facilities, transportation inspection point, and container/pallet storage facilities.

Construction to support the IBCTs has already begun. Seattle District recently turned over a 48,000-square-foot Mission Support Training Facility to I Corps and Fort Lewis commander Lt. Gen. James Hill. The building will house the latest in Army tactical training technology, and was built in support of transformation training and objectives. More than 300 computers will provide simulators for a unit battle command system.

Corps labs

Continued from previous page
creating a virtual 'racetrack,' and industry will come to us with their 'cars' for testing before they're built. The Corps of Engineers came up with the original idea for a Joint Virtual Battlespace, but we're just one small part of the group developing it."

A consortium of organizations is working on the JVB, all managed by the Program Manager for Joint Precision Strike (PM/JPS). The PM/JPS has its Integration and Evaluation Center (IEC) at ERDC's Topographic Engineering Center. The IEC will be the hub of JVB.

Besides ERDC, the consortium includes:

- Joint Precision Strike Demonstration.
- U.S. Army Simulation, Training, and

Instrumentation Command.

- U.S. Army Training and Doctrine Command's Analysis Center.
- U.S. Army Maneuver Support Center.
- U.S. Department of Energy National Laboratories.

The JVB will integrate a wide variety of interactive simulations currently in use by these organizations. It will provide a high-fidelity simulated environment to test and evaluate future combat systems (FCS) concepts. This virtual environment will improve the military decision-making process by allowing concepts for material, doctrine, and force structure to be evaluated in a wide variety of realistic conditions and scenarios

without building or fielding hardware. For the first time, it allows realistic high-fidelity terrain and weather effects in force-on-force simulations. (The Corps' contributions to the mix are terrain analysis tools, mobility modeling, and sensor modeling.)

So JVB will give the consortium a *common* environment containing the multitude of variables that impact future combat systems, instead of them developing multiple environmental constructs that may include differing assumptions.

Besides evaluating FCS concepts, JVB will also allow the Army to "plug-in-and-play" proposed technologies, concepts of operations, and tactics, techniques, and

procedures to evaluate their benefit before an investment decision. JVB will be scalable from the individual system/sub-system up to the joint task force level.

Initially, the JVB construct will support just virtual test and evaluation of alternative FCS designs. Over time, it will evolve into a more elaborate construct providing situational awareness and course of action analysis for both the FCS acquisition process and the Army envisioned for 2032.

(Deborah Quimby and Wayne Stroupe of ERDC's Public Affairs Office, and Jim Rogers, ERDC's Special Projects Officer for Future Combat Systems, contributed to this article.)

Army



Transformation

Building Tomorrow's Army

Prepositioning

TAC builds major installations in Qatar, Kuwait

By Joan Kibler
Transatlantic Programs Center

The Army is meeting major milestones in its security strategy in the Middle East by completing a prepositioning facility in Qatar, and by the rapid pace of construction on another new prepositioning installation in Kuwait.

The Army component of U.S. Central Command (USCENTCOM), U.S. Army Forces Central Command (ARCENT), maintains a forward presence in the region. Government-to-government agreements were negotiated with the Qatar and Kuwait to allow the prepositioning of military assets.

These facilities support USCENTCOM's efforts to protect U.S. interests in this vital region in accordance with the National Security Strategy. U.S. forces use these facilities under a variety of agreements, which include host nation involvement with providing and managing the facilities.

The U.S. Army Corps of Engineers' Transatlantic Programs Center is helping the Army to meet its engineering needs for the two major installations.

Qatar

The main base site in Qatar, Camp As Sayliyah, is the Army's newest prepositioning facility. Completed last summer, the three-phase, Congressionally funded construction program totaled more than \$110 million.

"This facility places a large force of armor and support units that can be quickly stood up in response to any crisis in the region," said former ARCENT-Qatar commander, Lt. Col. Martin Stanton. "It's the largest single prepositioning site for the Army in the world. Literally, the U.S. can fly troops in and issue the equipment to have them ready to go to war."

The site contains a variety of storage facilities and warehouses, such as controlled humidity, general-purpose, air conditioned, and general maintenance and supply. Its maintenance structures include a large maintenance and preservation building, and workshops.

"In total, there are 27 warehouses with about 1.6 million square feet or 36.3 acres of enclosed storage space," said resident engineer David Soltesz. "We also installed 10 kilometers (6.2 miles) of roads and almost four kilometers (2.4 miles) of fencing."

Support structures provide for a group headquarters, administration building, community center, dining facility, and enlisted and officers quarters. The site also has open storage areas, sunshades, and all associated utilities.

Construction of the first phase was fully underway in



Climate-controlled buildings at Camp As Sayliyah in Qatar store equipment for response to any crisis in the region. (Photos courtesy of Transatlantic Programs Center)

1996. "The contracts were structured to give the Army fully usable facilities with the completion of each phase," he said. "Practically all of the warehousing, storage, and maintenance facilities were completed in the first two phases. The quality of life facilities, such as quarters and community center, were completed in Phase III."

Having been at the project for its construction duration, Soltesz commented on a few of the major challenges.

"Any construction job in the Middle East will present similar challenges, such as placing concrete in 120-degree temperatures, or meshing the quality of work standards between the local labor force and U.S. specifications," Soltesz said. "But the quality of construction in Qatar is at the same level as you'd find on Army installations in the U.S."

"When the first phase of construction was finished, we expedited the turnover of the warehouses to relocate the equipment sets that were in temporary storage," Soltesz

said. "That was an intense period because we also had Phases II and III under construction."

"The Army also didn't have a large permanent party presence, so it didn't have a DPW (Department of Public Works) to perform operations and maintenance (O&M)," He added. "The Corps awarded an O&M contract to perform services in areas such as preventive maintenance, custodial, utilities, and roads and grounds."

The Army is now taking an in-depth look at its long-term O&M requirements, with Corps assistance during that study.

During the final turnover ceremonies, Stanton paid tribute to the entire team for its efforts in Qatar.

"For almost four years, this site was under construction," Stanton said. "When I arrived here, it was a big flat field. The Corps was just getting its office stood up, and

Continued on next page



The dining area and enlisted quarters at Camp As Sayliyah show the quality and comfort of the facilities. (Photos courtesy of Transatlantic Programs Center)

Installations get on-site assistance

By Anita Horky
Fort Worth District

What better way to understand and communicate with your customer than to place one of your employees in that customer's office? That's the concept behind the installation support coordinator position. Fort Worth District currently has ISCs working at three Army installations in Texas. The district employees work side-by-side with their Army customers in the installation public works offices.

"Having an ISC at the installation places our capability for support where it is needed — close to the customer," said Steve Zediak, the ISC at Fort Bliss who works out of the installation Directorate of Public Works and Logistics. "It creates a win-win situation for both the installation and the Corps. The Corps is able to provide the service/support needed, and the installation gains also. The ISC has helped foster teamwork and build relationships between all parties that are involved in the various aspects of installation management."

Every day is different for the ISC. On an average day, he or she can be found visiting construction sites, training areas or command headquarters; meeting with contractors, installation staff or Corps personnel; and making and returning lots of phone calls in between.

The ISC is a facilitator, adviser, consultant, customer satisfaction advocate, and serves as the on-site coordinator between the district and installation. Because the ISC is so closely involved in the



Steve Zediak (left), Installation Support Coordinator for Fort Bliss, Texas, discusses updating the post's master plan with Roy Bethel, the post's Deputy Director for Engineering. (Photo courtesy of Fort Worth District)

daily work processes, procedures, and challenges of the installation public works office, he or she can identify additional opportunities for the district to provide services to the installation.

The ISC role centers around communication. For example, when the installation director of public works has a question about how the Corps can help in a specific situation, the face-to-face answer is just down the hallway.

"There's an old saying, 'You can never really know until you have walked in the other fellow's shoes,' said Zediak, who was called "that two-headed Corps guy" by a previous director of public works. "This particularly applies to the ISC. There are challenges to working on both sides of the fence but, for the most part, the results have been very positive."

Mike Mocek, Deputy District Engineer for Fort Worth District, said, "Through

the ISC positions, we're getting to know our customer organizations and people much better than ever before. Knowing them helps us to understand their needs. Understanding their needs helps us deliver projects that best meet those needs."

Those customer needs may be current or in the future. By working closely with the installation, the ISC can better see the future of the installation and how the Corps can fit into that future. To that end, Zediak attends the Fort Bliss Installation Planning Board and Real Property Master Plan meetings where he learns about upcoming plans and programs necessary to support the mission of the installation.

Fort Worth District began the ISC program at Fort Hood, Texas, in 1996. The program was immediately successful, and now the district has ISCs at Forts Hood, Bliss and Sam Houston. While the ISC program has been successful, it's not a cookie cutter program.

"The intent is to understand and communicate better with our customers," Mocek said. "They are all different, so we must make the individual ISCs very situational so that we might best serve the needs of each customer."

The ISCs are free to the installations, paid for with installation support funds from Corps headquarters and supplemented by the district. "All of our supported customers we talk to can't say enough good about this program," said William Kidd, chief of the district's Military Branch, Programs and Project Management Division. "In fact, some have indicated they would fund the ISC if the Corps did not."

Prepositioning

Continued from previous page

Dave Soltesz had just arrived. Year after year, hundreds of people worked to build this facility, oftentimes in sweltering heat. This was a brilliant effort on the part of many people. It's one of the best-designed and well-built facilities I've ever experienced. I have never worked with engineers who understand the operational side as well as this Corps team has."

Army and Corps officials have traditionally paid high compliments to its Qatari hosts for their assistance and cooperation. A former TAC resident engineer said that the Qatar armed forces were always available to help resolve such construction issues as extending utilities into the site or site access for workers.

Kuwait

The second prepositioning facility is under construction by the Kuwait government at Arifjan, south of Kuwait City. When complete, the facility will replace Camp Doha, a former industrial warehouse complex that has been converted for use as an Army installation, and has been in use since the Persian Gulf War.

Camp Doha was leased by the Kuwait Ministry of Defense and provided to the Army to support its three major missions in Kuwait:

- Maintain prepositioned equipment, supplies and materials.
- Direct joint exercises with the Kuwait armed forces.
- Ensure the security of Kuwait.

"Camp Doha was intended as a temporary facility until the permanent installation was designed and built at Arifjan," said Col. Larry Ghormley, TAC's Gulf Regional Engineer. "A full brigade set of equipment is stored at Camp Doha, much of it outside. The new facility will

have most of the equipment sets stored in large warehouses, similar to the ones built in Qatar, to protect them from the harsh desert environment."

The Arifjan installation is a joint project between the engineering organizations of USCENTCOM, ARCENT, TAC, and Kuwait's Military Engineering Projects (MEP) office, the engineering arm of the Kuwait Ministry of Defense. TAC did major portions of the design, while MEP handled other designs.

For construction purposes, the Kuwait government divided the facility into four packages and has awarded three construction contracts, according to Ron Rhodes, chief of TAC's Arifjan Quality Assurance (QA) Office.

The packages are:

- Zone I, administrative and quality of life facilities. Awarded July 1999, estimated completion spring 2002 (TAC design).
- Zone II, industrial area, with warehousing, maintenance, and storage facilities. Awarded July 1999, estimated completion fall 2001 (TAC design).
- Zone III, ammunition storage area. Construction complete (MEP design).
- Zone IV, infrastructure (roads and utilities). Awaiting award (MEP design).

The Arifjan QA Office, with nine TAC team members, is responsible for assisting MEP's resident engineer staffs

for each of the zones.

"We advise and assist the Kuwait resident engineers in accordance with their procedures," Rhodes said. "Our role is to provide construction management and quality assurance advice and to interpret specifications that involve literally hundreds of submittal reviews and requests

for technical information. We also assist in joint inspections and, ultimately, turnover to the Army.

"In working on these Kuwait-awarded contracts, we've had to adjust Corps procedures to correspond with their methods of contract management," Rhodes continued. "The partnership is working well, and we've developed close working relationships with our MEP counterparts."

Rhodes also said that he has been pleased with the quality of construction by the Kuwaiti contractors.

Besides the ongoing construction, ARCENT has identified additional needs at Arifjan. Transatlantic Programs Center is designing an enhancement package that includes expanded administrative and housing areas, operational facilities, and furniture and furnishings, according to project manager Donn Booker. Design is expected to be complete this summer.

"Our goal is to turn over a modern, high quality facility that meets or exceeds the Army's requirements," Rhodes said.

"The facility places a large force that can be quickly stood up in response to any crisis in the region."

Mermaid spotted in Lake Michigan

By Joanne Milo
Chicago District

(In January the "Chicago Sun-Times" reported the discovery of a mermaid—a reclining, seven-foot figure carved into a great chunk of stone lying parallel to the shore on Lake Michigan just north of 39th Street.

Two days later, the "Sun-Times" reported that a Chicago sculptor, Rowan Villarreal, and three other artists created the mermaid sculpture 14 years ago. Chicago District and the Chicago Park District want to make this sculpture part of the Chicago Shoreline Project.)

The design, plans, and specs for the Chicago Shoreline project, 37th to 43rd Street segment, are currently under development. In early November, the Chicago Park District (CPD) brought the presence of the mermaid to my attention. My counterpart at the CPD, Rob Rejman, mentioned that they wanted to preserve it. Rob notified me that the CPD chief executive officer, Drew Becher, had become aware of the mermaid and "wanted it to be saved and used in the design for that area."

Apparently, the mermaid lies not far south of 37th Street, within the 37th to 43rd Street segment of the project. She is

a relief sculpture carved 14 years ago into a large armor stone that is currently located near the waterline. It also turned out that our construction representative at 33rd to 37th Street, Arthur Rundzaitis, had noticed the mermaid sculpture and had taken a couple of pictures of it.

Rob recently received a phone call from the daughter of the man who carved the mermaid. She told him that her father, Rowan Villarreal, who died recently, carved the mermaid purely for his own enjoyment while spending time at the lake.

The CPD would like to have her incorporated somewhere into the 37th to 43rd Street project, but the exact details haven't been determined yet. There has been talk about preserving the mermaid into the surface of the concrete wall at a drainage gap area, where she can be preserved and protected, and still be visible to users of the shoreline.

At this time we are planning to have the "mermaid armor stone" carefully removed from the construction area and set aside until her permanent fate has been decided by the CPD.

The parties involved in the project all seem to be on the same wavelength—that preserving this type of individual art only enhances the project. What's exciting is



This seven-foot long mermaid sculpture is carved into an armor stone on the shore of Lake Michigan. (Photo courtesy of Chicago District)

that we get to take a little piece of artistic expression and incorporate it into a brand-new structure that will last for 50-plus years. This will preserve the art of an individual who had a strong attachment to this piece of shoreline.

In fact, this topic has generated additional discussion about preserving artwork in other construction segments. Our designers for the Montrose North segment, STS Inc., have informed us that there are several stones within that segment that contain elaborate carvings. We believe

some of these pieces will be preserved. We plan to conduct a field visit to identify specific pieces for preservation in early spring, after the weather breaks and the snow and ice have cleared.

For me, this is exciting! I'm grateful that we have the chance to preserve these individual contributions, to make the project more interesting, and for future generations to enjoy. This is such a rare opportunity in the world of engineering.

(Joanne Milo is the project manager of the Chicago Shoreline Project.)

Maintenance shops upgraded in Europe

Article and Photo
By Alicia Gregory
Europe District

The 1/36 Infantry Division and the 2/37 Armor Division celebrated an engineer victory in January when they moved into newly renovated maintenance shops. Europe District beat a 120-day clock to successfully complete the lion's share of the work at Ray Barracks while the troops were in Kosovo.

The infantry and the tankers challenged the Corps to accomplish the work on a short fuse, and the district took the dare, betting on a new contracting tool, the Multiple Award Task Order Contract (MATOC).

The facilities at Ray Barracks in Friedberg, Germany, were in bad shape. In fact, almost a quarter of the vehicle maintenance facilities in Europe are substandard level, and U.S. Army Europe (USAREUR) is working hard to get Department of the Army support for more money to fix motor pools and tactical shops. Ray Barracks is one of the first to be renovated.

Beginning last August, contractors HSG Holzmann and SKE Maintenance GmbH & company were awarded two separate contracts, totaling more than \$1.9 million, to renovate three maintenance facilities. They installed new electrical, ventilation, mechanical, safety, and fire alarm systems. The contract included upgrades and repairs to the phones, roof, walls, and flooring. They also put in new bay doors on one of the buildings, and a new crane in another. One hundred and twenty days is an ex-



The renovated armor facility is large enough to service an M-1 tank indoors.

traordinary turn-around on a renovation of this magnitude, made possible only by MATOC.

"Using MATOC allowed us to make a lot of decisions in the field," said Rob Weaver, Europe District project engineer for the facilities. "It allowed us to get materials quicker and it gave me more options. I didn't have to go back to Wiesbaden (district headquarters) to get approvals; with the MATOC I could make decisions."

Under MATOC, top construction firms are on call to provide engineering construction support. Because the contracts are already in place, the normal solicitation and award process is reduced to the time it takes for competing MATOC contractors to walk

the job, develop proposals, and for the Corps to make an evaluation and award a task order. Contractors can work alongside the Corps and customers to make cost and time-saving suggestions. So MATOC is quicker than traditional contracting.

"For jobs under a certain price (\$250,000 to \$2 million), MATOCs can help get the jobs done quickly," said Lourdes Levy-Colon, project manager for the 284th Base Support Battalion. "If you have a good contractor it works wonderfully."

"I figured at this point I'd be asking for forgiveness because it wouldn't be finished," said Patrick Biliter, Deputy District Engineer for Programs and Project Management. "We took a risk and I'm

really proud to deliver these facilities."

"We're delighted," said CW3 William Pettit, battalion maintenance technician, 2/37 Armor. "There was a lot of excitement when they opened. The day we got the key, the soldiers were moving in."

Seventy-five soldiers from the 1/36 ID, and 68 soldiers from 2/37 AD were able to move into the renovated maintenance facilities, and found them a big change.

"Troop moral was low," said Levy-Colon. "It was a bad place to work."

Sgt. 1st Class Rickie Bywater, C Co. team chief, said that one problem was lack of heat because the doors wouldn't close. "When I first got here the plates that run along the bottom of the doors were broken up and didn't shut all the way," he said.

Master Sgt. Don Drake, battalion motor sergeant, 2/37 AD, said his engine work is easier thanks to new overhead lift capability. "Before we had to work outside using recovery vehicles to lift engines," he said. "The new cranes allow us to work inside, and keeping the soldiers inside keeps them happy."

"We'll be able to work more efficiently," said Green. "The facility has better lighting, so soldiers can work on vehicles by the bays. With the new exhaust blower, we can work inside without leaving the doors open for ventilation. Once the doors are open, all the heat escapes. Now the soldiers don't have to stop and take a break to warm up when it is cold outside."

"Just the way the facilities look improves the moral of the soldiers," said Drake. "When it looks nice, the soldiers want to take care of it."

Russian chem demil lab complete

By Kim Gillespie
Engineering and Support Center,
Huntsville

The effort to reduce the threat of chemical weapons in the Russian Federation took a big step forward when the Russian government accepted the Central Chemical Weapons Destruction Analytical Laboratory (CAL) on Jan. 11 from their American counterparts who oversaw its design and construction under the Cooperative Threat Reduction Program.

The laboratory, located at the State Scientific Research Institute of Organic Chemistry and Technology (GosNIIOKhT) in Moscow will be used for four basic functions in support of the Russian chemical weapons destruction program. It will develop chemical agent analytical methods and procedures, provide on-the-job training to Russian personnel, serve as the quality assurance and quality control center for the Russian chemical weapons destruction program, and conduct analyses of environmental samples from the various chemical weapons destruction sites.

"The CAL was accepted by GosNIIOKhT from the U.S. Defense Threat Reduction Agency (DTRA) after first being accepted from our contractor by the Moscow Resident Engineer and transferred to DTRA," said Chuck Riley, Huntsville Center project manager. The Engineering and Support Center, Huntsville in Huntsville, Ala., managed the design-build contract for the facility by providing contracting, engineering, and construction services to the product manager for Cooperative Threat Reduction (PMCTR), which is responsible to DTRA for destroying chemical weapons in Russia.

"Extensive design, renovation, and construction work were required to bring the 36-year old facility up to a state of the art chemical laboratory," said Art Davies, resident engineer in Moscow. While termed a "renovation," all existing architectural, mechanical, and electrical features were fully demolished and the renovation began with only the basic structural shell.

New mechanical and electrical systems were installed, as well as complete renovation of finished floors, walls, doors, windows and ceilings. Also, a new stair tower and elevator were built at the end of the existing building. Each laboratory was provided with new casework, cabinetry, and fume hoods with dedicated exhaust systems.

Additionally, communication systems, fire protection and alarm systems, and an emergency generator were installed in the facility. Laboratories were also equipped with modern computerized chemical analytical equipment.

The 4,425 square-meter, four-story facility houses 27 laboratories, various administrative and support offices, as well as logistics, mechanical, and electrical spaces. Following acceptance, about 30 Russian scientists and laboratory technicians received a six-week training program in the use and maintenance of the complex computerized analytical equipment.

Riley credits the experience, expertise, and willing cooperation of those involved with the project as the critical factor in its successful completion. "PMCTR was re-



The Central Chemical Weapons Destruction Analytical Lab has state-of-the-art exhaust hoods. (Photo courtesy of the Engineer Support Center, Huntsville)

sponsible for identifying what the customer, GosNIIOKhT, required. Huntsville Center and the Transatlantic Programs Center developed the requirements into a design-build contract and provided contract administration and technical oversight of the contractor.

ConTrack International, Inc. (CII) in Arlington, Va., and their design subcontractor, Stanley Consultants in Muscatine, Iowa, prepared the final design, then CII with their construction subcontractor, Skanska East Europe Oy in Helsinki, Finland, performed the construction and renovation work," said Riley. "Skanska Oy

hired Russian construction workers in addition to its own Finnish supervisory and management staff, so it was definitely an international team effort."

The project faced numerous challenges.

"From a technical standpoint, installing 36 fume hoods along with their exhaust systems, replacing all plumbing, mechanical, and electrical systems and installing all new laboratory casework and state-of-the-art chemical analytical equipment was, itself, a big job," said Davies. "This was complicated by the age and deterioration of the building and its location inside a secure compound in Moscow. Additionally,

we had the logistical challenge of shipping all this material from the U.S. to Moscow, and getting it through Russian customs."

Other challenges included the unexpected discovery and cleanup of asbestos contamination throughout the building, stop-work orders due to political and treaty issues, as well as delays when critical materials were held in Russian Customs while the exact provisions of the U. S./Russian agreements were debated.

"On top of all of this, the project had to take into consideration both U.S. and Russian building codes, as well as the specialized criteria of both countries for laboratories dealing with chemical agents," said Davies.

Davies credited the hard work of Mike Maynard, the Corps' on-site construction representative who, in addition to his quality assurance duties, spent numerous hours facilitating shipping, delivery, and Russian Federation customs issues.

The contract was awarded in October 1996, design progressed through 1997, and construction started in January 1998. Despite unforeseen delays and other added work, the construction costs came to about \$20 million, including \$5 million in laboratory analytical equipment costs. Funding for the project was allocated through Congress under the Nunn-Lugar Appropriation for the Cooperative Threat Reduction program.

PMCTR and Huntsville Center continue to work on the design and construction of the Russian Chemical Weapons Destruction Facility in Shchuch'ye, Russia, which will employ a neutralization technology developed by the Russians to destroy Russia's stockpiles of aging chemical weapons. Construction of that facility is expected to be complete in 2006.

Student gets experience in JED

Article by Maureen Ramsey
Photo by Andrew Uehara
Japan Engineer District

Leilani Nance, a senior at Zama American High School in Japan, has a dream.

"I'd like to attend college and major in computer engineering," she said.

Enter the Zama American High School Cooperative Work Experience (CWE) program.

"CWE gives students a chance to get real experience in a variety of work disciplines in the greater Camp Zama Community," said Bobbi Donald, CWE program director. "We're fortunate that Japan Engineer District is one of CWE's best supporters."

Besides first-hand on-the-job experience, students learn job search skills such as how to read and understand a vacancy announcement, complete a job application, and write a resume, Donald added.

Since no one in her family is an engineer, Nance said she hopes her job at JED will give her a better perspective on the disciplines in engineering. "My greatest challenge has been deciding what engineering area is the most interesting," she said.

Nance's supervisors, Jay Tanaka and Ed Chang, gave her a good understanding.

"Engineering is a very rewarding and



Leilani Vance uses the Total Station survey equipment.

challenging occupation," said Tanaka. "I want to give young people the opportunity to experience what an engineer does, then let them decide if it may be a course of study they want to pursue."

"We want Leilani to get hands-on civil engineering experience," Tanaka continued. "We worked with her going over engineering drawings, took a plan-in-hand trip to a proposed project site, and gave her hands-on experience using our Total Station surveying equipment. Leilani enrolled

in a three-week introductory architectural course at the Arizona State University last summer. She gained a lot from it, and that was evident during her time with us."

"I've designed a floor plan for my home, and have learned how to operate the Total Station," said Nance. "I'm having fun!"

"She has good judgment in space and distance, which are important in architectural design," said Chang. "Plus, there's homework that I require her to complete. The CWE program is an excellent opportunity for high school students to explore their field of interest."

She applied to North Carolina A&T, Arizona State University, and Virginia Tech.

"I appreciate all the time and work that's being spent in helping me with CWE," said Nance. "I'm still trying to decide on what section in engineering I like the best and plan to major in. Everyone is doing a great job trying to help me make that decision."

JED, as a part of the Camp Zama Army community, provides a perfect setting for high school students interested in the science and engineering curricula. And it works the other way, too.

"Having a student with Leilani's interest and scholastic ability 'charges us up' to make her time with us a meaningful experience," said Tanaka.

Corps, Fish & Wildlife sign partnership

By Ginger Mullins
Huntington District

The U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service (USF&WS) do not always march to the same drummer. But the Corps and the USF&WS recently took a step forward together in Huntington, W. Va. After a two-day joint session between Huntington District and the West Virginia Office of the USF&WS, both agencies agreed to and signed a formal partnering agreement. This partnership agreement provides a unique framework for the two agencies to seek to better understand their respective missions.

Debbie Wegmann, a biologist in the district's Plan Formulation Branch, was excited about the spirit of cooperation.

"It takes out the 'we' and the 'they,'" said Wegman. "We would come together and sit on our side of the table with our agenda, and they would sit on their side of the table with their agenda. Now, we have our agenda. I find that compelling."

Col. John Rivenburgh, the district commander, initiated the agreement. The springboard was a staff retreat held to update the district's strategic business plan. One initiative was to establish a formal partnering agreement with the USF&WS. Jeff Towner, the USF&WS field supervisor in Elkins, W. Va. readily became a proponent of a partnering agreement because he had consistently sought ways to improve communication between the two agencies.

Towner previously worked in planning and regulatory in the Chicago, Detroit, and Alaska districts and is in a unique position to comment on the new partnership. He is very complimentary of Rivenburgh's partnering concept.



This wetland is part of the Greenbottom mitigation area for the lock chamber replacement at Robert C. Byrd Locks and Dam. The project was coordinated with the U.S. Fish and Wildlife Service the West Virginia resource agencies. (Photo courtesy of Huntington District)

"Col. Rivenburgh should be credited for having the vision to see the value in the Corps and Fish and Wildlife Service partnering more effectively," Towner said. "The agreement we signed is already resulting in better communication, more effective project execution. In time, I believe it will provide greater protection of natural resources. I hope other districts and Fish and Wildlife field offices will follow the example we set in West Virginia."

The partnering agreement's mission statement is "to foster better communications and coordination. This will lead to better decisions, and improve efficiency in accomplishing our collective agencies'

mission of quality public service, effective project execution, and protection of important natural resources."

In support of this mission, certain goals and objectives were agreed to in three Corps programs — regulatory, planning, and operations. One common goal to all three programs is to meet with the USF&WS to share information, discuss specific projects, provide education about respective programs, and improve interagency processes.

Other goals include identifying environmental concerns, formulating resource values, developing mitigation plans, and identifying opportunities for fish and wildlife enhancement in Corps' studies, project pro-

posals, and operating projects under existing operation and maintenance authorities.

The USF&WS hosted the first of the interagency meetings in Elkins Jan. 24-25. Corps representatives from Planning and Operations participated.

The agenda included learning more about the Fish & Wildlife Coordination Act, improving the field review process, updating project status, discussing environmental issues in the navigation industry, dredging and associated studies, and establishing environmental teams to look at projects and identify ways to improve the environment and lower O&M costs.

I attended the meeting and found it successful on many levels. While the agenda certainly met the intent of the partnering agreement, participants told me they noticed that relationships among participants were being reinforced or changing.

I found the partnering agreement is an effective mechanism that encourages participants to seek first to understand, then to be understood. As Stephen Covey outlines in *The Seven Habits of Highly Effective People*, we open the door to creative solutions and third alternatives when we understand each other. Our differences are no longer stumbling blocks to progress, but become stepping-stones to synergy.

"There will be times when the agencies do not agree, but the partnership provides the opportunity to work issues out," said Mark Taylor, a project manager in Regulatory Branch. "Both the district and the Elkins Field Office are committed to develop improved working relationships that will promote quality public service."

(Ginger Mullins is the Chief of the Environmental Analysis Section of Planning Branch in Huntington District.)

Study may improve navigation, habitat

By Jennifer Wilson
Little Rock District

Aquatic habitat and navigation do not always have to be at odds. Little Rock and Tulsa districts are working on a study that might improve navigation and aquatic habitat along the Arkansas River. And flood reduction may be realized for some low-lying farmland in west Arkansas.

The districts are working together to complete a regional study of the McClellan-Kerr Arkansas River Navigation System in Arkansas and Oklahoma. The navigation study is investigating possible operational and structural changes to the system that might improve its ability to quickly drain high water from upstream reservoirs.

"This could mean fewer days of high water on the navigation system, which could improve navigation and, incidentally, reduce local flooding," said Renee Wright, Little Rock District study manager. "This could help the recreation and fanning industries along the system, too."

Alternatives. Some alternatives that will be investigated include removing channel restrictions such as dikes and revetments, building high-flow relief structures or additional levees, modifying existing structures, changing system operations, and purchasing more flowage easements.

Study team members also are looking at habitat improvements that could be done in conjunction with the study.

When the navigation system was completed in 1970, native and sport fish thrived in the river. The 17 locks and dams provided large, stable pools. Areas behind and around dikes, revetments, and other control structures provided perfect habitat and fish spawning areas.

A 1997 study of the McClellan-Kerr Navigation System by a contractor found "Overall the project must be judged environmentally beneficial. What was once useless is now heavily used...The McClellan-Kerr Arkansas River Navigation System is an outstanding example of the improvement of nature through human action."

The structures have done their job of directing river flow. But as a result, they have begun to silt in and cause aquatic habitat to gradually disappear. The Arkansas Game and Fish Commission, along with anglers and naturalists, have expressed concern about this decline in fishery habitat.

Meeting. "We knew from the beginning that this was a navigation study, but at the same time Lee Bass, the first project manager, began working with the Game and Fish Commission and sportsmen to explain the study," said project manager Ron Carman. "By listening to them, we realized there were things we could do in conjunction with this study that would improve wildlife habitat."

Carman has traveled the river across Arkansas. He has met with people from the Arkansas Game and Fish Commission, bass clubs, Ducks Unlimited, and Corps hydrologists. They have spent hours compiling a list of areas where measures could be taken to improve fish habitat and spawning, as well as wetlands that benefit waterfowl.

The Game and Fish Commission is reviewing the list to find the most beneficial areas where work could be done.

"Then they'll get back with us, and we'll take a closer look at their suggested areas for improvement," Carman said. "We need to determine if the habitat improvements would improve, hinder, or have no impact on navigation."

"If a notched dike or other habitat improvement would improve navigation, it's something we could probably do

in conjunction with this study," Carman added. "If it had a negative impact on navigation, we couldn't do it."

Appropriate habitat improvements could possibly be done as mitigation for implementing some of the study's navigation improvement. Some measures could include notching dikes so that fish can get behind a stricture and spawn, or making cuts in structures to provide flow into backwater areas and scour areas that have silted in.

"We probably can't do much habitat work in the upper reaches of the pool because that's where we already have to dredge regularly to maintain channel depth," Carman said. "We don't want to notch dikes and move that sediment back into the channel in these areas."

Lower portions of the navigation pools where there is more channel depth will likely offer better locations for habitat improvements.

Challenge. "This is something St. Louis District has done before," Carman said. "The result was a system of river structures that met environmental, navigation, and economic goals. That's what we're striving for, too."

As the navigation study continues and areas for improvements are identified, the study team will call in Claude Strauser, a hydrologist with St. Louis District who is considered an expert in this area.

"The challenge of this study is finding the best way to incorporate all the stakeholders' interests into a socially, economically, politically, and ecologically sound solution," said Ed Rossman, Tulsa District study manager. "It's taken a lot of teamwork to get to this point. That teamwork includes coordination in the districts and with the stakeholders who have an interest in the Arkansas River."

Around the Corps

Capital real estate

Baltimore District's real estate team is hunting for a developer for one of the largest undeveloped parcels of land remaining in the nation's capital. A request for proposal for land lease development of about 50 acres at the U.S. Soldiers' and Airmens' Home was issued in December through the home's contracting office.

"Our role is like that of a site developer in the private sector," said Frank Palmer, Chief of Appraisal Branch.

Palmer said that the size and location of the undeveloped parcel is drawing a lot of interest. He estimated the initial phase of construction would be about \$200 million.

"We were hired two years ago to do a market survey and market analysis to determine the best use of the property," Palmer said. "Then, in early 2000, almost immediately after we completed that aspect, we were hired to market it for development."

The real estate team wrote the request for proposal and held a pre-proposal conference on Jan. 25. Nineteen potential developer teams (about 100 people), met with officials at the conference.

The district is putting together the committee to decide which proposal to select, and it will handle the ground lease. After selection, the district hopes to be the project manager overseeing the lease implementation and regulatory requirements.

Quality award

Tennessee Quality selected Nashville District as a winner of the 2000 Tennessee Quality Commitment Award. The Quality Commitment Award is given to organizations that demonstrate progress in building sound processes.

"The search for success in business has become a search for excellence," said Marie Williams, president of the Tennessee Quality program. "The 2000 Tennessee Quality Award (TQA) winners represent the best of Tennessee. Nashville District and many other organizations have done a great service to Tennessee by setting high standards. They have the courage to change, and the diligence to work."

Fifty-one private and public sector businesses applied for the 2000 Award in the four competition categories. The Tennessee Quality program is patterned after the Baldrige National Quality Award, the national standard of excellence for quality and productivity. Under the TQA program, award nominees receive site visits from members of the TQA board of examiners.

Every organization receives a feedback report from its evaluation team.

"We didn't enter for the award, but to measure ourselves against the criteria, to improve service to our customers, and to hit a level of excellence that met their needs," said Lt. Col. Pete Taylor, Jr., Nashville District Engineer. "This recognition demonstrates our commitment to quality, and that we're working to get even better."

Long-time employee retires

In a brief ceremony at Honolulu's Island Nursing Home on Feb. 2, long-time Honolulu District employee Elsie Smith received her certificate of retirement from Lt. Col. Ronald Light, District Engineer. Her 59 years of service made Smith one of Hawaii's longest tenured federal employees. During that period she received numerous awards, including the Superior Civilian Service Award, and was twice selected as Hawaii's outstanding federal woman employee of the year.

Smith was known by many as the media relations specialist of both Pacific Ocean Division and Honolulu Engineer District, although she worked in a variety of public affairs positions since 1962. In January 1999, when Smith was felled by a brain aneurysm, she had accumulated more than 3,000 hours of sick leave and just recently completed using them. Smith's health is stable

although she is still convalescing.

Smith was a Corps employee since 1957, serving initially as secretary to the POD commander before assuming public affairs duties. Her first federal job was as a clerk in July 1942.

New clinic

On Feb. 1, two days early, a ribbon-cutting ceremony at McGuire Air Force Base, N.J., officially opened a new Ambulatory Health Care Clinic.



The lobby of the new clinic features dramatic lighting. (Photo courtesy of New York District)

Jerry Valade, lead project engineer for New York District, led a final walkthrough of the \$31 million facility. Paul Jalowski, resident engineer, conducted the formal transfer, and Lt. Col. Chuck Smiley, the McGuire Base Civil Engineer, signed the transfer document. This allowed the installation to prepare to open the clinic to patients in April.

Mitigation banking conference

Get the latest scoop on mitigation and conservation banking, from regulations to roadblocks, techniques to opportunities, at the 4th National Mitigation Banking conference April 18-20 in Fort Lauderdale, Fla.

Co-sponsored by the U.S. Army Corps of Engineers, general sessions offer the latest information on federal and state regulations, and facts on the increasing competition facing private mitigation banks. A point/counterpoint lunch addresses In-Lieu Fee and how the new Federal Guidance will work. And an "Ask the Experts" Q&A followed by a special Florida issues panel highlight the conference.

Both beginners and old hands will find what they need in the "Introductory Track" and "Advanced Track" on April 18, and information targeted to both on April 19.

Attendees will enjoy the Radisson Bahia Mar Fort Lauderdale in the heart of the Bahia Mar Yachting Center, near Las Olas Boulevard with restaurants, jazz clubs, shops, and art galleries.

For more information, contact the Terrene Institute at www.terrene.org, or phone (800) 726-5253.

FUSRAP

The Formerly Utilized Sites Remedial Action Program (FUSRAP) team of New York, Kansas City, and Tulsa districts was recently honored as the Corps' Project Delivery Team of the Year. The team was recognized for its ongoing success at New York District's three New Jersey FUSRAP sites in Maywood, Middlesex, and Wayne.

The team coordinated characterization and remediation activities occurring simultaneously at all three sites, developed a GIS database for the Maywood site, engineered and built a temporary state-of-the-art wastewater treatment plant at the Wayne site, developed a soil disposal approach at the Middlesex site that became a FUSRAP model, and completed an innovative soil volume reduction pilot study with potential application across FUSRAP.

Whale clean-up

On Feb. 1, the *Hayward*, New York District's largest drift collection vessel, was called into action. But this time it wasn't to recover a downed helicopter in the harbor or to remove aircraft wreckage from the East River, but to remove a dead whale found floating off Port Elizabeth, N.J.

The *Hayward* towed the 47-foot-long, 47-ton mammal

to Caven Point, N.J., for examination by a team from the marine Mammal Stranding Center.

"It required a team effort between the vessel's crew, the shop personnel, the Marine Mammal Stranding Center, and the disposal contractor to complete the autopsy and dispose of the carcass," said Alan Dorfman of Caven Point. "This whale was gone in 24 hours, thanks to everyone working together."

This is the third dead whale the *Hayward* has recovered recently. On Jan. 3, a 60-foot finback was discovered floating near Bayonne, N.J., and on Dec. 11 a 40-foot finback was found between Brooklyn and Staten Island. Boat crews from New York District also towed away both whales.

Experts say that whales follow food sources, which may be unusually close to the shore this winter, bringing the whales into areas they don't usually inhabit.

The *Hayward* is one of several boats that routinely patrol New York Harbor removing floating debris and hazards to water navigation. The *Hayward* and vessels of her type remove more than 600,000 cubic feet of drift material annually. During the years, the *Hayward* crew has recovered helicopters, barges, a house, and a seaplane that crashed in the East River in 1998.

Education partnership

Alaska District has had a School/Business Partnership with Aurora School on Elmendorf Air Force Base since 1991. District volunteers tutor children in math and reading in their classrooms, working one-on-one with students that teachers identify as needing extra help. Volunteers also judge the students' science fair projects.

Tables turned

The tables were turned on Dr. Joseph Westphal, Assistant Secretary of the Army (Civil Works), Col. Brian Osterndorf, New England District Engineer, and members of New England District when they were recognized by Massachusetts for the Corps' environmental work at a ceremony where Westphal was honoring others for their efforts in the same field.

Westphal and district representatives presented plaques and letters of appreciation signed by Vice President Al Gore to members of the Massachusetts Corporate Wetlands Restoration Partnership.

Toward the end of the ceremony, Westphal and Osterndorf received a special award in a surprise presentation by Robert Durand, Secretary of the Massachusetts Executive Office of Environmental Affairs. The award was for the Corps' work with Coastal America, and for supporting the Massachusetts Executive Office of Environmental Affairs Wetlands Restoration Program while assisting Section 22 and Section 1135 projects.

Lewis & Clark website

There is an intranet website for information about the Lewis and Clark commemoration within the Corps. The website is at w3.nwk.usace.army.mil. (Please note that "w3" does not stand for "www.")

Urban warfare range

The American Consulting Engineers Council (ACEC) has announced that the designer of the Zussman Urban Combat Training Center at Fort Knox, Ky., has received an Honor Award in the 2001 National Engineering Excellence Awards Competition.

Polyengineering, an architectural-engineering firm, designed the sophisticated urban combat training range. Louisville District administered the design contract from the district office. The Fort Knox Resident Office administered the construction contract.

ACEC will present two plaques, one to the designer and one to the facility user (Range Division), at the formal evening banquet on March 13 at the Renaissance Mayflower Hotel in Washington, D.C.



Roger Wilson performs routine maintenance at Amory Lock.



A push-boat and barges move through Amory Lock.

Unsung heroes keep locks running, 24 hours a day, seven days a week

Article and Photos
By Tim Dugan
Mobile District

Roger Wilson has a tough job. He's a lock and dam operator pulling graveyard shifts at the Amory Lock on the Tennessee-Tombigbee (Tenn-Tom) Waterway in northeast Mississippi. Wilson is one of the U.S. Army Corps of Engineers' unsung heroes who keep the nation's navigation business running during the midnight hours while the rest of the world sleeps. There are five lock operators at Amory Lock, and about 50 for the Tenn-Tom Waterway's system of 10 locks.

For them, each day is a new challenge. The day before Thanksgiving, Wilson was alone at Amory Lock as the clock neared midnight, pulling the swing shift, 10:30 p.m. to 6:30 a.m. His major challenge is keeping the lock running smoothly during his shift.

"There are two or three tows coming in tonight," Wilson said.

River stair-steps

Imagine a river as a steep path cut into a hillside. Now imagine how much easier that hill is to climb if steps are installed. Locks and dams are those "steps." They make it possible for barges to travel a river that otherwise would be too fast and shallow to navigate.

Lock operators run the machinery that allows river traffic to pass from one lock to another, traveling up or down the grade of the river one step at a time. An eight-barge tow will take 45 minutes to an hour to travel through a lock.

The lock operator signals the vessel captain desiring entry and directs his approach into the lock. They operate hydraulic or electrical machinery to open the lock gates to allow barges to enter. They make sure gates have proper miter (mate tightly when closed). They assist crewmen in mooring, and in the movement of vessels in lock approaches. Then they operate the valve machinery and pumps that either flood or drain the lock pool to raise or lower the barges to the next level of the river. Finally the operator opens the gates to allow the barges to go on their way.

Other tasks

Lock operators have a number of other miscellaneous tasks. They record information on vessel identity, arrival and departure time, commodity, tonnage, and so on. They read pool level gages, record and report gage data,



Roger Wilson stands ready at the control console of Amory Lock.

and raise and lower spillway gates to maintain proper lake level.

They also perform routine maintenance on the dam, lock structure, equipment, buildings, and grounds. "We do a lot of preventive maintenance," Wilson said. "We have a contractor to do the heavy stuff."

It's a precise but routine job.

Safety

"Safety is a priority," Wilson said. "In fact, tonight we have 3,000 tons of gasoline and 2,800 tons of diesel fuel coming through the lock. That's a *real* safety concern."

It can also be hazardous for the deckhands on the tow-boats. Several years ago a barge deckhand fell overboard

at Amory Lock, but was rescued. "It's dangerous work," Wilson said. "They have to keep safety in mind at all times. We have to be watchful. There are a lot of hazards out here."

The hours a lock operator keeps are a subtler hazard. Wilson works rotating shifts because Amory Lock operates on a three-shift cycle, eight hours per shift.

"Four locks on the Tenn-Tom work two shifts, with 12-hour shifts," Wilson said. "The swing shift is rough. It's hard on your body, the constant changing schedules. You never get completely adjusted, and they say it'll take years off your life."

Traffic

All Tenn-Tom locks operate 24 hours a day.

"Commercial traffic on the Tenn-Tom has been increasing," Wilson said. Many barges use the Mississippi River to transport cargoes south, traveling with the river current, but then return north on the Tenn-Tom Waterway, which has no current to fight. "We get a lot of empty tows using the flat water," he said. "It's cheaper for them."

Currently, they have a lot of pleasure boat traffic coming south for the winter.

Isolation

In one way, Wilson is lucky because he lives in Amory. "I live close to the lock," he said. "There are some locks on the Tenn-Tom that are so remote the operators are 45 minutes from anybody."

That remoteness can also cause problems. Law enforcement officials check Amory Lock a few times a night, but some locks so remote that operators must take their own security precautions. "Nowadays, you never know what might happen," Wilson said. "A few weeks ago one of the locks got a call to be aware of an escaped convict on the loose."

Technology changes

Wilson has 16 years on the Tenn-Tom, six years as a contractor, and 10 years with the Corps. Technology has changed a lot during that time. "The computer is changing everything," he said. "Everything is getting computerized. It seems like every two years everything changes."

After a routine shift, Wilson finished up 6:30 in the morning on Thanksgiving Day, going home to get some rest when most other people in the U.S. were just getting up to enjoy family gatherings, a holiday feast, parades, and football.