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Engineer Update

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Chief affirms engineer importance; creates wage-grade champion

In the short time I've been the Chief of Engineers, you have told me some things that are important to you, things that keep you in the U.S. Army Corps of Engineers. First and foremost, you want to make a difference. Next, you want to be proud of your organization and what it stands for. And you want opportunities to grow in competence and as a person.

I've made some recent decisions, and put some changes in action, in response to what I've heard you say. These decisions are important to your future and to the future of the Corps as an organization. Collectively, these decisions are driving our "refreshed" Vision document and the USACE Campaign Plan that you will put into practice on March 30.

Lt. Gen. Robert Flowers, Chief of Engineers, talks to Ernie Carlson, Captain of San Francisco District's debris boat *Raccoon*. (Photo by Donna Shepard, San Francisco District)

As we roll out these plans and changes, you will note the high value I place on three things — teamwork and effective project management, technical excellence, and investing in people. These early decisions relate to engineering and construction, and to the wage-grade employees of our Corps.

The Corps' Strategic Vision is to be the "World's Premier Public Engineering Organization." To attain our Vision, we must be absolutely grounded in world-class engineering and construction capability. But I couldn't say that to you with a straight face when my Engineering and Construction (E&C) Division is located in the Kingman Building at Fort Belvoir, Va. That's about 20 miles from the rest of Corps Headquarters at 441 G Street in Washington, D.C.

So I decided to change that. E&C will soon relocate lock, stock, and barrel to Corps Headquarters. On Jan. 4, I visited the E&C Division to discuss this change with them. I know it's a hassle for the 60 E&C folks, who moved there just a few months ago, to move again so soon. But as I told them, the pendulum has swung too far toward project management and away from engineering, and needs to swing back toward a more balanced position. I asked them to trust me on this decision, for it's the right thing to do for the organization.

Please don't misunderstand – I am no less dedicated to project management. The project management business process is the standard business process of the Corps of Engineers, and will remain so. But this move is the first of several strategic actions we will take during my tenure as Chief of Engineers to elevate the importance of the engineering community in the Corps.

Now I'd like to turn from the engineers for a moment to the Corps' wage-grade employees. You are a lot like the infantry and other combat arms of the Army. The vast network of wage-grade employees do much of the real work of the Corps of Engineers. You operate our locks, dams, vessels, boatyards, and recreation sites. You are often the *only* impression the public has of the Corps and of our Army.

You present an excellent image, and many of you receive top-flight support from your supervisors and organized labor groups. But, unlike many of the Corps' professionals, you do *not* have a peer champion in Corps Headquarters to look after your welfare. I've decided to fix that by assigning a new role to the USACE command sergeant major, the role of wage-grade employee champion.

Command sergeants major perform an important leadership role in the Army. They represent the interests of enlisted soldiers and non-commissioned officers directly with the commander. When Command Sgt. Maj. Robert M. Dils reports for duty in February, I will task him to work closely with the wage-grade employees to understand your needs and aspirations, and to support you under my direct authority.

In the future there will be other situations, in other fields and functions, that demand I place a "mark on the wall" to demonstrate how much the Corps' future rides on having good people, motivated to do the right things very well. These changes, and the ones we will make in the future, will fine-tune our organization so that you can continue to excel.

Essayons!

ROBERT B. FLOWERS
Lieutenant General, USA
Commanding

10 Years Ago

Corps had major role in Gulf War

*(**Editor's note:** Ten years ago this month, allied forces invaded Iraq and Kuwait, the final act of a drama which had occupied the world's attention ever since Iraq invaded Kuwait in August, 1999. In about 100 hours, the U.S. and its allies decimated one of the world's most powerful armed forces, ending Saddam Hussein's bid to become a regional superpower and control the Middle East oil supply.*

Many Corps people, military and civilian, served in the Persian Gulf during Desert Shield and Desert Storm. Many others supported their efforts Stateside. This article chronicles the Corps' involvement in the Gulf War.)

The Persian Gulf War began with Iraq's invasion of Kuwait on Aug. 2, 1990. Iraq's leader, Saddam Hussein, ordered the invasion and occupation of Kuwait with the apparent aim of acquiring that nation's large oil reserves. On the same day, the Middle East/Africa Projects Office (MEAPO) and South Atlantic Division (SAD) activated their emergency operations centers.

Aug. 3 — The United Nations (U.N.) Security Council called for Iraq to withdraw from Kuwait.

Aug. 6 — The council imposed a worldwide ban on trade with Iraq.

Aug. 8 — Hussein formally annexed Kuwait as a province of Iraq.

Iraq's invasion of Kuwait and the potential threat it posed to Saudi Arabia prompted the U.S. and its Western European North Atlantic Treaty Organization (NATO) allies to rush troops to Saudi Arabia to deter a possible attack. Egypt and several other Arab nations joined the anti-Iraq coalition and contributed forces to the military buildup, known as Operation Desert Shield.

Hussein built up his occupying army in Kuwait to about 300,000 troops. Units of the 82nd Airborne Division were the first to take up defensive positions in Saudi Arabia against possible attack from Iraqi troops massed on the border.

Aug. 10 – Headquarters of the U.S. Army Corps of Engineers activated its crisis management team.

Aug. 13 – The first Corps civilian, MEAPO's Ben Wood, deployed to Saudi Arabia. He was the first civilian engineer on the ground.

Aug. 14 – Lt. Col. Charles Cox, MEAPO Deputy Commander, and four Corps civilian team members deployed to Dhahran, Saudi Arabia, to establish a Corps forward operating element to support U.S. forces in the Persian Gulf.

Aug. 17 – The Dhahran Area Office (DAO) opened in support of the U.S. Army Forces Central Command. The MEAPO Personnel Office established a family assistance program to help the families of deployed employees cope with the departure of their loved ones.

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Insights

'Looking for love in all the wrong places'

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

While visiting Northwest Division not long ago, I picked up a local newspaper on my way to a restaurant where I planned to enjoy my breakfast and see how my favorite football team did the preceding weekend.

I was sorely disappointed by my team, so I turned dejectedly to the front page to see if there was anything happening in the world that might warm my heart and make my lukewarm coffee taste a little better than Drano. What was on the front page was even more depressing than the shameful scores in the sports section.

So I wandered aimlessly through the paper looking for something that might help me forget the bad news on the front page, the abominable scores in the sports section, and the fact that my coffee is now ice-cold.

Then I found it — the personal ads! There were *pages* of them! One read:

"Elizabeth Taylor look-alike (43) with a passion for life in quest of a man (35-45) who is confident, emotionally and financially secure. Respond, xxx-xxxx."

Another one read:

"I don't lie. Honest, funny, attractive, sensitive, caring, male 42, willing to take care of you in LTR/marriage. Just call, xxx-xxxx."

And there were hundreds more.

At first I was amused by these strange, funny ads. Some actually made me laugh even more than the comic section. But as I continued to read, the humor gave way to a very sobering thought. I was laughing at what was probably some very lonely, hurting peoples' effort to find love. The more I thought about it, the more I realized that these personal ads were actually more depressing than the headlines and the scores on the sports page. Here were pages and pages of people who were looking for love, but looking in the wrong place.

As I continued to read, the ads began to speak to me and I got two clear messages. First, there is a deep hunger in our world for love and acceptance. And second, many people are at a loss as to where to look for true love. I am aware that we all need someone to care, someone to be with, someone to share our dreams, someone to walk in the park with, someone to love us. This is a legitimate need, and it is not confined to those who place ads in the personal section of the paper. It is universal.

I am also aware that, in addition to the legitimate need for romantic love, we all have an even *deeper* hunger for a love that transcends our romantic desires. This need is not quite as near to the surface of our emotions as our need for romantic love, and cannot be expressed in a one-inch ad in a local paper, but it is just as real. It is a need for love that meets the deepest need of our soul, and we often don't know where to look.

The good news for this Valentine's Day is, the Great Lover of the world, God, has placed His own personal ad in His book, the Bible. He has declared how much He loves each of us, and that He has made his love available to all His children.

I invite you to read about it for yourself. John 3:16 and Ephesians 2:4 are good places to start, but don't stop reading until you find the answer.

Well, if you still don't have a Valentine's Day card for your special someone, better rush down to the card store before all of the good ones are taken. You don't want to get stuck with a leftover with smudges, wrinkled corners, and a stupid saying. And, if you need a little extra help, you might consider a flower or some candy.

Have a Happy Valentine's Day, and remember the greatest love of all.

(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.)

Commentary

'Invisible' is no way for anyone to live

By Alexander Kufel
Pacific Ocean Division

One of the harshest things I ever experienced as an individual was being ignored as a human being. I don't mean simply not paid attention to. I'm talking about when one is *not seen* when one walks down the street; not acknowledged in any way as occupying the same planet. In such an environment, it doesn't take a genius to conclude that whatever opportunities life offers to others are not necessarily available to you.

I have experienced such invisibility, and it had a sobering effect on the assumptions I made about the lives of others. I hadn't given it much thought until then, and it caught me by surprise. I escaped undamaged; I could make a choice whether or not this would be my way of life. But as I look around America at the beginning of the 21st century, I'm convinced that such conditions still exist, and that others do not have the luxury of making the choice I did.

My teenage neighborhood in upstate New York, just outside of Buffalo, was made up mostly of longtime residents of German or Slavic descent. Outsiders were a curiosity, but no particular group was any more unwelcome than another.

My link with the world was radio. Late at night, I listened to WKBW, broadcasting jazz and soul music from downtown Buffalo.

Shortly after I turned 18, the legal drinking age in New York then, a young black singer named Nancy Wilson came to town. She was performing in a bar downtown. Life in Buffalo was divided clearly along ethnic lines, neighborhood by neighborhood, and this bar was in forbidden territory, euphemistically called "the inner city."

But my curiosity got the better of me. I just *had* to see Wilson and hear her for myself. I couldn't find anyone to go with me, so I went alone.

I got off the bus and crossed the boundary street with some trepidation. It was early evening and there were lots of people out and about in the neighborhood. I walked several blocks toward the bar was and realized with astonishment that people were *not* noticing me. They absolutely did *not* see me at all. I don't know if I was so out of place that people were just being polite and trying not to stare, or if I was experiencing discrimination for the first time. But during that walk to the bar, I did *not* exist. I became invisible.

At the crowded bar, I was served a beer without being either challenged or acknowledged. Nobody paid *any* attention to me.

Nancy Wilson was beautiful, and I had a great time listening to her first set. The band took a break and Ms. Wilson walked toward the bar. People made room for her. She looked right at me and said, "I'm starved. This place doesn't serve food. Is there any place decent to eat around here?" I stammered that there was an Italian restaurant several blocks away. "Take me there," she said.

Nobody seemed to notice as I floated out the door with her hanging onto my arm. It occurred to me during the small talk over spaghetti that I hadn't a clue why she chose me. In retrospect, it may have been rebelliousness on her part; maybe I was young enough to seem "safe." At any rate, she didn't break any more rules of the day and allowed me to pay for the meal.

When we returned and she started her next set, she dedicated her first song to "Alex." Nobody turned to look to see who Alex was. They all knew, and Alex didn't belong. Alex didn't *exist*.

I went back in that bar and others in the neighborhood several times after that, reveling in the freedom and safety that came with invisibility. After all, I always had my real life to return to. Once in a while a drunk would break the silence and ask, "What the hell are you doing here?"

Eventually I stopped going. I grew discouraged with the knowledge that an enormous portion of America's population was considered invisible on a daily basis. Like them, there would be no problems as long as I didn't ask to be included. It was no way for a person to live then, and it's no way to live now.

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'Dragon Slayer' neutralizes super-fuel

They called it the "green dragon" for its deep green, super-hot flame. There was nearly 1,900 pounds of pentaborane, a highly volatile 1950s super fuel, at Redstone Arsenal, Ala., and no one could easily dispose of it.

Enter the Mobile District team of Marlene Nester, project manager; Doug Webb, chemist; and Rick Kendrick, on-site manager. "In July 2000, we completed the destruction of almost 1,900 pounds of pentaborane," Nester said.

The project dates back to March 1996 when "Redstone Arsenal requested that Omaha District obtain a rapid response contract to dispose of the pentaborane cylinders," Nester said.

There were some delays getting the project underway, so in August 1998 Redstone Arsenal requested that Mobile District take over the project. "In September 1998, Mobile District awarded the pentaborane contract," Nester said. In March 1999, the district awarded a task order for a treatability study.

In February 2000, Redstone Arsenal received a permit from the Alabama Department of Environmental Management for the on-site treatment using a remote-controlled system.

The four, 800-pound cylinders, along with several smaller canisters of pentaborane, were the last known government stockpile of the chemical. "They were destroyed using an innovative, water-based, remote-controlled processing system," Nester said.

Redstone Arsenal and project manager Craig Northridge of the Environmental Directorate, teamed up with the Alabama Department of Environmental Management, Mobile District, and environmental contractors led by Vista Technologies, Inc., of Huntsville, Ala.

A legacy of the Cold War, pentaborane was produced during the 1950s under both Air Force and Navy contracts as part of a boron hydride "super fuels" effort to power advanced, high-speed bombers and, later, missiles and rockets. Before execution of this treatment and disposal project, the pentaborane had been stored on Redstone Arsenal for years since no safe treatment method existed.

In a recent memo to Mobile District, Maj. Gen. Julian Sullivan Jr., Commander of the U.S. Army Aviation and Missile Command, said "We made significant strides over the past few years in developing and implementing a safe treatment method. Support from the U.S. Army Corps of Engineers throughout this process was instrumental in this project going forward safely and successfully. The support Mobile District personnel gave during the treatability study phase, preparation for full-scale treatment, and during treatment, brought great credit upon them and the U.S. Army Corps of Engineers."

Sullivan presented letters of appreciation to the Mobile District team for their support in the complex effort.

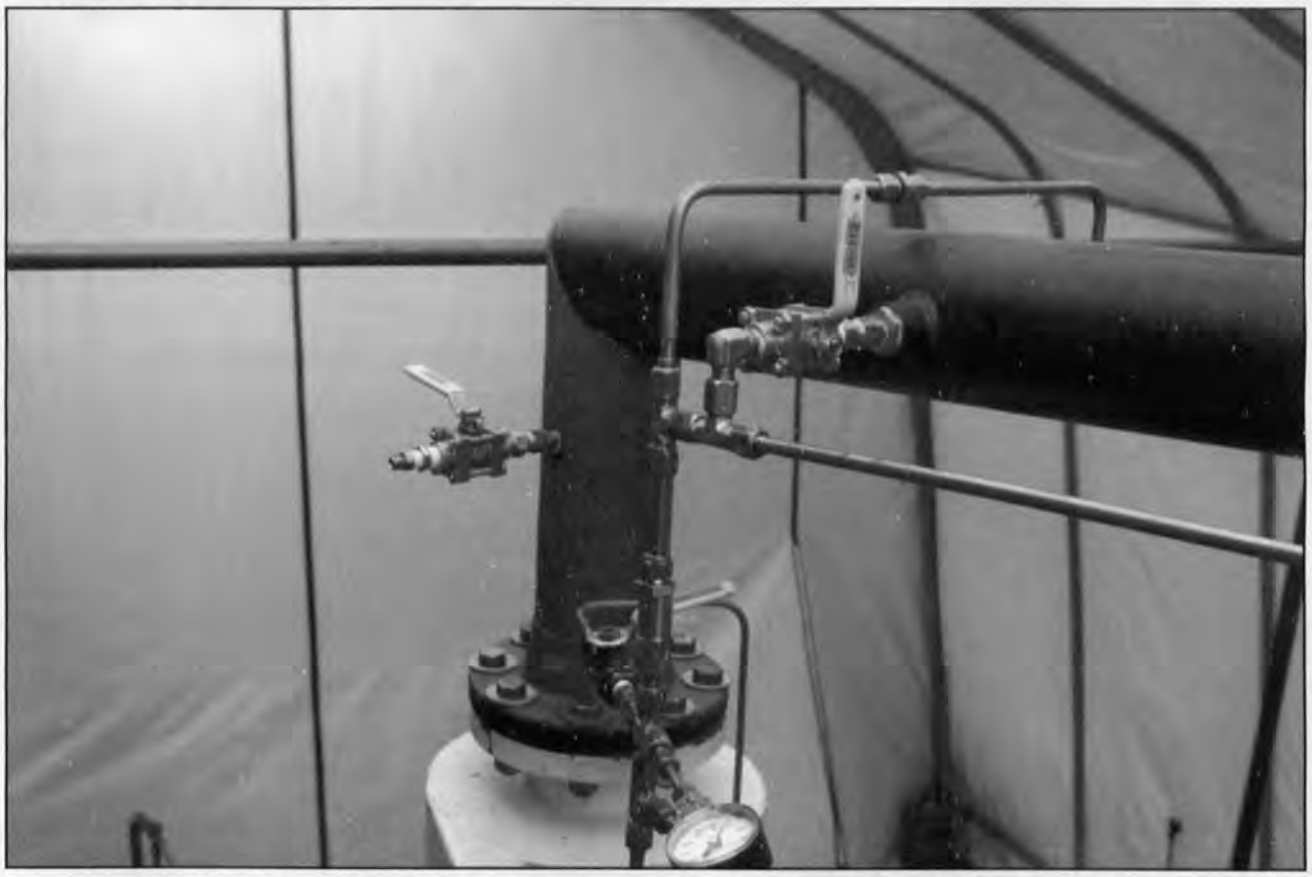
"The successful completion of this pentaborane treatment marks the first time that a large-scale, non-detonation treatment of pentaborane has been performed," Sullivan said. "This is significant as this new system proved to be the safest, most efficient, and most environmentally friendly method of treatment/disposal. This process now provides an alternative to open detonation, which in many cases, is not a true option due to safety or environmental issues."

Difficulties in handling pentaborane became evident during its production and use, and led to it being abandoned as a viable fuel. Unused pentaborane stocks in several hundred cylinders remained mothballed in storage for almost three decades at Edwards Air Force Base, Calif., Redstone Arsenal, and various research facilities around the country.

Cylinders at Edwards AFB were detonated in the desert last year, but this was not an option for Redstone Arsenal with its proximity to populated areas. Since pentaborane is extremely toxic nature and burns with a deep green flame on contact with air, it is nicknamed the "green dragon."

Since no proven safe large-scale treatment systems for pentaborane existed, the Mobile District team identified the information necessary to design a system, oversaw a pilot study to provide the necessary information, designed a full-scale treatment system, implemented that system, and successfully completed treatment of the pentaborane on Redstone Arsenal.

Four pentaborane tanks are relics of 1950s rocket programs. (Photo by Craig Northridge, Redstone Arsenal)



A remote-control set-up handled the actual neutralization process, which combined the volatile pentaborane with water to produce hydrogen gas and a mild solution of boric acid. (Photo by Craig Northridge, Redstone Arsenal)

Integrated Environmental Services, Inc., Atlanta, Ga., a specialized subcontractor, designed the full-scale treatment system and successfully operated the remote-controlled system. They set up near the secured bunker where the pentaborane was stored and destroyed the chemical by combining it with steam under controlled conditions.

The process converted pentaborane into hydrogen and boron. The hydrogen was vented from the system while the boron combined with water to form a harmless solution of mild boric acid. This system, dubbed "Dragon Slayer" by its designer, uses only water to attain complete chemical conversion.

After a six-month effort that began at Redstone Arsenal, Ala., last February, 1,747 pounds of pentaborane was successfully destroyed.

The project goal was to dispose of the pentaborane to meet waste disposal laws in a safe and environmentally conscious manner, Army officials said. Direct contact was limited to the moving and handling of the cylinders. Personnel attired in gas-tight suits took cylinders from their storage location and placed them into a sealed, environmentally controlled chamber. Air was removed from the chamber, and replaced with nitrogen to minimize chances of air leakage into the cylinder or connecting piping during processing.

An extensive array of sensors and air sampling equipment monitored all aspects of the operation, including ambient air quality to ensure the system was operating at peak efficiency. The team's work has made this process available to safely treat any remaining pentaborane found in the U.S. It has already been used in Houston.

(The public affairs offices of the U. S. Army Aviation and Missile Command, and Mobile District contributed to this report.)

Omaha unearths old buried dynamite

By Sheri Hronek
Omaha District

Some 60 years ago, workers buried cases of dynamite in a remote field in South Dakota. The dynamite was left over from building roads and dams in the northern plains. That was the 1930s, and burying was an accepted way to dispose of unused explosives.

Today, unearthing those buried munitions was the task of the Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers.

Nancy Mueller, community involvement coordinator for EPA's Region 8, says this project is a first. No one had ever encountered the such a large quantity of buried dynamite. According to an eyewitness in the 1930s, 146 cases of dynamite and 40 boxes of blasting caps were buried in a field near what is now Agency Village, home to about 600 members of Sisseton-Wahpeton Dakota tribe.

Questions. The problem of searching for the dynamite was compounded by the uncertainty of the exact location. There is no record of the disposal from more than 60 years ago, and it is still uncertain whether the Works Projects Administration (WPA), a federal agency at that time, buried the dynamite. (The WPA existed from 1935 to 1943 to deal with unemployment in the Great Depression. It undertook many construction projects throughout the U.S.)

The EPA and the Corps also could not be certain of the type of dynamite. Some guessed that the dynamite was World War I vintage, which was made of black powder. However, the search had to be planned for the worst-case scenario, so the EPA and the Corps planned their approach assuming the dynamite was made of nitroglycerin.

The drama that unfolded in Agency Village last August required complete evacuation of the tribe members, who had to leave their homes for one week while the Corps and its contractor, IT Corporation, looked for the buried explosives.

The tribe handled the logistics of the evacuation. When efforts to locate the dynamite failed, the project team decided to set off an explosion in the trenches that had been excavated, and the resulting secondary explosions yielded traces of the buried dynamite. It had been composed of black powder, which returns to its natural state.

"It would have never gone off without something like that," said Dave Butler, the Corps' Explosives and Ordinance Safety member of the team. "It would have stayed in the ground. You could dig right through it, and you would never know it was there."

They found evidence of the old dynamite only found after reviewing videotapes of the explosion and noticing an orange center in the black smoke.

The project started when Nathan Thompson, a tribe member, reported the dynamite burial to the tribal council. Thompson had been one of the crew who buried the dynamite in the 1930s.

Search. The council then approached the EPA.

"We act on all citizen's reports," Mueller said. "It's not unusual to act on the tip of just one person. Once we started looking, we called the Corps in and did some electromagnetic surveys, which seemed to corroborate the report."

Mueller noted that the Corps does "a lot of work for us in these removal actions. They are our rapid response, our technical consultants." The Corps, she said, has contract mechanisms in place and can react quickly. "Given what we were faced with, everything went well. I think the Corps responsiveness was great. Jim O'Neill, (Corps Rapid Response project manager) did an outstanding job coordinating everything and keeping everyone happy."

The first meetings with the Corps were held in the summer of 1999.

"We undertook the initial survey with three different pieces of electromagnetic equipment and ground penetrating radar to see what we could find," said O'Neill. "We found one good-sized anomaly beside a concrete foundation that we believe was one of the bunkers they used. However, it was difficult to find any trace. The dynamite was buried in wooden crates, and there's not a lot of metallic mass associated with them. There would not be much for instruments to look for. One instrument uses ground resistivity (its resistance to the flow of electricity) to locate previously excavated areas. But with the time that has passed, the freeze/thaw returns the ground to its natural state, and the fainter any image is."

Al Meyers, IT Corp.(left); Joe Nolan, Omaha District; and Wayne Sisk, Army Environmental Center, examine dirt for traces of old dynamite. (Photo courtesy of Omaha District)

Thompson told them that three holes were dug for the explosives — 82 cases of dynamite in one; 64 cases in a second; and the 40 boxes of caps in the third.

Because the initial survey was inconclusive, the Bureau of Indian Affairs (BIA) arranged for a bomb dog from Grand Forks Air Force Base. "The dog hit in the three areas, but he couldn't pinpoint the location," O'Neill said. Bomb dogs detect nitrates in explosives and since farmland may have been treated with nitrate fertilizer, the dog's findings were inconclusive.

Excavation. The next step in the search involved excavation. Remote-controlled equipment dug 10-foot deep trenches. By digging trenches, the search could cover a larger sampling area. Since Thompson indicated the holes were about 12 feet deep, a stack of cases that large should be found at the 10-foot depth. A camera on the equipment allowed them to watch the process; videotapes were made and reviewed to be sure nothing had been missed.

Butler, representatives from IT Corp., and crewmembers stayed in a bunker about 1,000 feet from the digging site to supervise the process. Eighty-two cases of dynamite, if accidentally exploded, could leave a hole 70 feet in diameter and about 24 feet deep.

"We couldn't dig very deep very fast because of the possibility of nitro, which is more sensitive and easily detonated during excavation," O'Neill said. "We based everything we did on the worse-case scenario to ensure safety." As a safety procedure, an ambulance remained nearby, and the local hospital was notified of the project.

The community college in Sisseton keeps a sense of humor about the search for the old dynamite. (Photo courtesy of Omaha District)

Another major safety factor was the evacuation of the families from the area. "The tribe played a major important role in this project," Mueller said. "They were actively involved in the whole evacuation process, and they took care of their people. That lifted a huge burden off us so we could focus on the more technical side of the project."

Evacuation. "We had Plans A, B and C," said Jake Thompson, tribal council vice chairman. The tribe started planning the August evacuation in the spring and organized six committees to handle transportation, security, food, lodging, medical, and housing. They transported the elderly, families and children, and belongings, boarded up windows on all homes, protected propane gas tanks, and secured the area for the week that the members were elsewhere. The tribe also found the temporary housing, using motels and emergency housing, and made arrangements for food for the relocated members.

The tribal police worked 16-hour days to patrol Agency Village, sometimes riding horseback or on bicycles to have silent patrols.

The EPA will reimburse the tribe for move expenses, and for any damage to the homes.

Cooperation. Although leaving their homes for a week inconvenienced residents, the outcome was positive for everyone involved. "Everyone came together, Indian folks and non-Indian folks, just being folks," said Jake Thompson, related to the man who brought the dynamite to the tribal council's attention. "There were no disagreements, and they had the highest remarks for our people. The Corps can be proud of the people they sent over; they deserve recognition from their department."

"I've never been treated so well in my life," said Butler. "The people on the reservation are very nice people."

BIA environmental engineer Roy Pulfrey said he was "impressed that the federal agencies and the tribe worked together well, that so many groups could get together and agree. I was also impressed with the tribe's evacuation plan, and with their housing authority for doing all the inspecting, boarding up windows, protecting propane tanks, providing temporary housing, health needs, and feeding the people. They were organized and did them well."

Jake Thompson summed up, "It's a real positive event. I'm proud to be part of the whole thing. It was a first class operation. The federal agencies and the tribal government worked hand-in-hand, and everyone was treated equally. I have the highest respect for them."

(Sheri Hronek is a contract writer for Omaha District.)

Jonas Jordan Photo

Navigation

Keeping the Nation's Harbors and Waterways Operational

Navigation mission is old, continuing

By Chuck Parrish
Louisville District

Army engineers have had a presence on the Ohio River for 200 years, assisting in surveying, mapping, and planning and constructing navigation facilities to assure safe and efficient movement of commerce and people.

History

The history of Louisville District is rooted in the role it played in developing navigation projects on the river, notably those built at the Falls of the Ohio at Louisville, Ky. There, in its natural state, the river dropped 26 feet in just over two miles.

The first canal and locks around the Falls were completed in 1830. Since then, they have been enlarged several times. The U.S. Army Corps of Engineers assumed jurisdiction at the Falls in 1874 and removed all tolls on the movement of goods.

The Canalization Project on the Ohio was completed in 1929, resulting in 50 locks and dams along the entire river; the project at the Falls was named Lock and Dam No. 41. In the 1960s, the canal was widened to 500 feet, the old wicket dam replaced with a non-navigable dam, and a 1,200x110-foot lock built. The 600x110-foot lock remained. During this period, the project was renamed McAlpine Locks and Dam in honor of William McAlpine, Louisville District's only civilian district engineer.

McAlpine

Now, at the beginning of the 21st century, the district is undertaking another project to improve navigation at the Falls. Construction is underway on a second 1,200'x110-foot lock to replace two antiquated, inefficient locks. The joint venture of Morrison Knudsen and Lane Construction will build a cofferdam and remove the old locks during the next two years. Another contract will be awarded to build the new lock and access bridge across the locks on to Shippingport Island.

The project is scheduled for completion in 2007 at a cost of $276 million. The cost is borne 50/50 by congressional appropriations and the navigation industry. Towing companies pay a tax on diesel fuel that goes to the Inland Waterways Trust Fund, from which allocations are made to support key navigation projects in the nation.

There are several challenges to building at this site in the heart of the Louisville metropolitan area. Not the least is public safety. Shippingport Island is the site of a hydroelectric plant and Louisville District's Repair Station, and a popular location for fishing, jogging, and bicycling. The only access to the island is by two bridges crossing the locks that are in the middle of the construction and used for haul routes.

So the public's use of the island is now closely guarded. Also, close communication is required with the lockmaster and his staff, since construction is taking place near the existing 1,200-foot chamber, which must remain open at all times since it is the only route for navigation through this strategic location.

Another issue is the need to minimize the impact of noise, pollution, and traffic on the nearby community of Portland.

This artist's rendering shows what the new Olmsted Locks and Dam 17 will look like. (Graphic courtesy of Louisville District)

These complexities have been addressed in a series of meetings with local officials, the public, the towing industry, small businesses, and minority contractors. This process has produced relationships which enabled the project to move forward.

Traffic calculations reveal it would take a semi-truck every 15 seconds, 24 hours a day, 365 days a year on a nearby interstate to carry the same cargo that moves through McAlpine locks each year. The new lock is crucial to the safe, efficient movement of cargo on the Ohio River at Louisville.

Additional information on the McAlpine project is available at www.usace.army.mil/cd/mcalpine.htm.

Olmsted

Three hundred sixty miles downriver from the Falls, Louisville District is building the largest civil works project in its history, the Olmsted Locks and Dam, 17 miles above where the Ohio empties into the Mississippi River.

Olmsted will replace Locks and Dams 52 and 53, the last wicket dams on the Ohio River, which were built in 1928-29. Half of the $1 billion project will be paid by the navigation industry, and the project is scheduled for completion in 2010.

This strategic location is called the hub of the Ohio and Mississippi rivers system. Barge traffic moving between the Mississippi, Ohio, Tennessee, and Cumberland rivers must pass through the Olmsted site. More tonnage passes this point than any other place in America's inland navigation system.

The Olmsted project will have two 110-x1,200-foot lock chambers on the Illinois shoreline. The dam will have five tainter gates, a 1,400-foot navigable pass section of steel wickets, and a fixed weir section.

When raised, the wickets will maintain the required navigable pool upstream to the Smithland Locks and Dam, as well as to Kentucky and Barkley locks on the Tennessee and Cumberland rivers. When river flows are sufficient, the wickets can be lowered to allow traffic to move over the dam without passing through the locks. This reduces delays caused by locking through the system.

Rick Schipp, resident engineer at Olmsted, listed two challenges at the project. The cofferdam in which the locks are built is nearly a quarter-mile wide and a half-mile long. Also, at this location there is an annual 45-50 foot fluctuation in the river elevation. In addition, because of the site's proximity to the New Madrid Fault, the design called for extensive use of reinforced steel in the concrete, requiring challenging construction techniques.

The locks are nearing completion. They were filled with water last fall, and the cofferdam is being removed. Subsequent work includes building and placing the floating lock approach walls; building the dam with innovative in-the-wet methods; and building a boat ramp for the community of Olmsted, Ill.

The Olmsted project overview and construction progress photos are available on the web at www.usace.army.mil/olmstead.

Ned Durden, left, waits with divers Glenn Bacon and Burt Moore for a cargo ship to pass before continuing their dive in Brunswick Harbor.

Dive officer Walt Lanier gives last minute instructions to diver Burt Moore and stand-by diver Glenn Bacon.

Camaraderie, adventure, good pay

Dive teams handle Corps' toughest extra duty

Article by Nancy Gould
Photos by Jonas Jordan
Savannah District

The water in Savannah and Brunswick harbors is black and thick, like split-pea soup. Suspended sediment in the water creates a darkness so impenetrable that a diver can become disoriented as he makes his slow descent, the glow from his flashlight doing little to light the way.

In the 25-year history of Savannah District's dive team, the group has performed many difficult tasks in the inky waters of those harbors, the Intracoastal Waterway and Kings Bay Harbor. Their work ranges from investigating reported obstructions to scoping out anomalies on the river bottom — a requirement of the cultural resource clearance process before widening or deepening work can begin.

"Diving gives me an adrenaline rush," said Burt Moore, a dive team member who says that on more than one occasion he's bumped into a live object that swam away from him. "In a way, I'm glad I *can't* see what's down there!

"When we're crawling on the bottom, blindly groping for what we need to do our work, we're in constant communication with the surface crew through an umbilical line hooked to our helmet," Moore added. "We depend on them and the monitoring equipment for support and direction."

Diving is an additional duty. Each team member has normal job duties and responsibilities; they dive only when their special skills are needed.

Navigation

Walt Lanier, the district's dive officer during most of the team's existence, has led more than 350 dives in all kinds of water, supervising fellow divers and coordinating all aspects of each mission. The dive team performs most of their investigative dives in water up to 100 feet deep; they also work as dive inspectors for contract dives.

Lanier said, "Whenever the district uses contract divers, a district diver inspects the operation to ensure compliance with federal regulations, and to make sure things are done right." Added Gary Sego, assistant dive officer, "We tend to be really tough inspectors because we dive *and* we know the regulations."

Gary Sego tends diver Burt Moore.

Dives requiring underwater construction or demolition and those in excess of 100 feet are performed by contract because a decompression chamber is required at that depth.

Besides working in the Savannah and Brunswick harbors and surrounding areas, the team performs dives at the three hydropower plants maintained by the district — Hartwell, Thurmond, and Russell. Lanier said that working at the lakes is easier and less dangerous because there is visibility, and no current to contend with.

As team leader, Lanier manages all dives. "We always have a pre-dive conference and plan everything before each mission," he explained. "We review drawings, what we're going to do, how we're going to do it, and we carefully go over procedures for mishaps — something that has paid off since we've had no lost-time accidents in the dive team's history.

"It's been fun, but some aspects of the job are big challenges," continued Lanier. "Maneuvering in the Savannah Harbor is one. My kid brother, who pays money to jump from airplanes, says there's no way he'd do it. It's not for everybody; there *are* risks."

In the past, the team used self-contained underwater breathing apparatus (scuba) for all their dives. But now regulations require them to use surface supplied air with communications whenever the dives are deep or the visibility is limited. This is accomplished with an umbilical line that is physically attached to the diver's helmet. The umbilical line carries both the air hose and the intercom wire. The intercom allows the diver to tell those on the boat how he feels and if he needs to come up — a big advantage over scuba. Another advantage is that the diver does not have to worry about running out of air at 60-70 feet under water and making an emergency trip to the surface. And should the diver get tangled or need assistance, another diver can be sent down, descending hand-over-hand along the umbilical line to the troubled diver.

Formed in 1976, the dive team consisted originally of three volunteers, then grew to 15. Now it has eight members, all from Operations Division. Why do these employees who already have full-time jobs take on this extra responsibility? The reasons vary. Some like the change-of-pace, some the unique challenges of diving for the district, but most just enjoy diving.

Sego, a long-time team member, admits it's been a good way to earn extra money through the years. Although the work is tough and the water cold, it pays well.

Divers earn premium pay for performing hazardous work. "It's interesting work at times," said Sego, recalling that in 1985 the team recovered 100 Confederate shells and other relics from the wreck of the sunken ironclad *Georgia*.

"I also like working with the guys on the team," continued Sego. "We have a good group. There's camaraderie and trust among us — something you need when you're under water and your lifeline is monitored by your teammates working topside."

Lanier confesses that for himself and a lot of the guys, being on the dive team is something of an ego trip. But ego aside, the primary motivation to stick with it is their love of diving.

Survey team battles cold, Murphy's Law

By Paul Machajewski
and Peter Verstegen
St. Paul District

The survey team shot a baseline across the ice, then used an ice auger to drill holes to take hydrographic surveys. Snowmobiles were their standard mode of transportation. (Photos courtesy of St. Paul District)

*(**Editor's note:** Many of the Corps' people work outdoors, facing the worst nature can throw at them as part of their daily jobs. This article details how one crew accomplished their mission despite Minnesota weather and Murphy's Law.)*

The old hotel was gone, so was the maple tree. Two reference points to survey a project site had vanished. But the survey crew from St. Paul District did not need directions on where to go next.

"The last time we were up here, back in January 1997, there was an old rundown hotel standing nearby," said Jim Marquardt, survey technician with the winter survey crew. The old hotel had been a survey reference point.

"Up here" is northern Minnesota at Lake of the Woods, a 1,485-square-mile lake about 10 miles from the Canadian border. Marquardt plus Mark Scholl, a survey technician, and Kevin Ressie, a small craft operator, made up the crew. In early January they performed a project condition survey on the Warroad Harbor Project on the southern shore of Lake of the Woods.

The survey was part of St. Paul District's navigation mission. The district maintains navigation projects much like road crews maintain highways, and builds breakwaters or jetties to protect homes and businesses from waves. Other navigation improvements include deepening and widening harbors so that watercraft can move safely.

The Warroad project is a shallow-draft harbor seven feet deep, and the crew was there to measure sedimentation.

"According to the books, our benchmark should be 2.6 feet from the 14-inch maple tree next to the hotel. The benchmark's gone too," said Marquardt.

Using a metal detector and digging through the ice and snow did not pay off, and the crew determined that the benchmark was either buried or destroyed when a nearby casino parking lot was built.

So the crew put their land survey expertise to work. They drove snowmobiles out on 30-inch-thick ice dotted with scattered fishing shacks. Then they surveyed a one-mile baseline from the shore of Warroad Harbor onto the frozen lake. Once they established that line, the crew used an auger to drill through the ice every 10 feet along that line, took water depth measurements, and recorded them.

As odd as it sounds, winter is actually the best season to do such work.

"Winter conditions provide better information, better control, and help workload distribution," said Dan Krumholz, operations manager for the Channel and Harbors Project. "Surveyors can measure points on the ice, which is stable, and much better than bouncing around in a boat. Measurement is more precise. In some cases where we can't use global positioning, land controls offer more accurate recordings of water depth."

But the weather causes problems of its own. During this survey, the temperature was five degrees below zero with a wind-chill of about 20 degrees below zero. The water temperature was 31 degrees.

"Safety is always first on any job," Ressie said. "In these conditions, we all need to be extra careful." Scholl added, "We watch out for each other concerning frostbite and windburn."

The survey crew wore special flotation survival suits, which protected them from the cold and wind. The suits would have also protected them if they had broken through the ice. "You never know when you're going to go through," Ressie said. "These suits provide us with the protection we need."

Although the conditions sound harsh, they were actually fairly mild.

"Survey crews have encountered ice thickness up to 48 inches, and experienced air temps of minus 30 below zero with wind-chills of minus100," Krumholz said.

And, oddly enough for a hydrographic survey, they also had to worry about flight safety. The frozen navigation channel also doubles as a winter landing strip for small aircraft, and pilots need a smooth lakebed for landing. So the crew has smoothed out the piles of ice left by their auger either with a flat-bottomed airboat that glides over snow and ice, or with an ice-rake pulled behind a snowmobile.

The survey information gathered on this trip under review at the project office in Fountain City, Wis., to determine if dredging will be necessary to maintain the access channel to Warroad Harbor.

The survey information also benefited area residents. "They like to know how thick the ice and how deep the water is," Marquardt said. "It helps them decide if the ice is thick enough for their pickups, and which lure to use for ice fishing."

System gives detailed view of waterway

By Penny Schmitt
Wilmington District

When we were kids, those computers on "Star Trek" used to spit out complicated answers pretty fast. But they gave Mr. Spock words and numbers. The Geospatial Information System (GIS) that Wilmington District uses to help manage the Atlantic Intracoastal Waterway (AIWW) is more like that giant-screen view of the galaxy on the bridge of the starship *Enterprise*.

The GIS images displayed on the district's computer screens can zoom down onto a 36-foot-wide bridge span, or pull back for a 300-mile long view of the waterway. The types of information (called themes) vary from numerical data, to aerial photos, to U.S. Geological Survey maps, to microstation design files that show details like mile markers and channel centerlines. When users access layers of information, they can put together and print maps that show a variety of features.

Solving problems

All this information helps Wilmington District to manage the waterway effectively. "We can use data to solve problems from our desktops," said Richard Lewis, GIS coordinator for the district. "For example, maps show the most current hydrographic survey data. That can tell us exactly where dredging is needed."

At the same time, navigation staff can find the best place to dispose of dredged material. "Here's a map of Radio Island, one of our disposal areas near Morehead City," Lewis said. "The map shows that Disposal Area 34 was surveyed last August, and currently could receive up to 170,000 cubic yards of material."

The amount of data available in the system is hard to imagine. Wilmington District's boundaries include 308 miles of the waterway, from the North Carolina-Virginia state line to Little River Inlet in South Carolina. Along the way, the database records information about side channels, turning basins, inlets, bridges, 222 early dredged material disposal sites no longer being used, 87 active disposal facilities, and many other features.

Users can zoom in on the waterway anywhere from mile marker 34 at the NC –Va. border to mile marker 338 in South Carolina. And the story is not over at that point. Eventually, the entire length of the waterway to St. Johns, Fla., will be included on the GIS. "We're part of South Atlantic Division, and we are looking for regional management opportunities," Lewis said. "The AIWW GIS is a wonderful tool for management across boundaries."

Future directions

Lewis highlighted several future directions for the GIS that are already under development at Wilmington District. "The current GIS tables were developed to include units from all side channels, connecting channels, and the channels for the North Carolina State Ports at Wilmington and Morehead City," he said. "Thus, the database can easily be expanded to include these projects."

"We've recently added digital information on colonial nesting waterbirds, which use some of our inactive disposal areas for nesting," Lewis added. Since North Carolina is home to many species of waterbirds, some endangered, the Corps' contribution to protecting nesting sites is important.

Another planned addition to data is a new theme showing survey data that tracks the controlling depth of channels over time. "It'll allow us to continuously monitor shoal development," Lewis said.

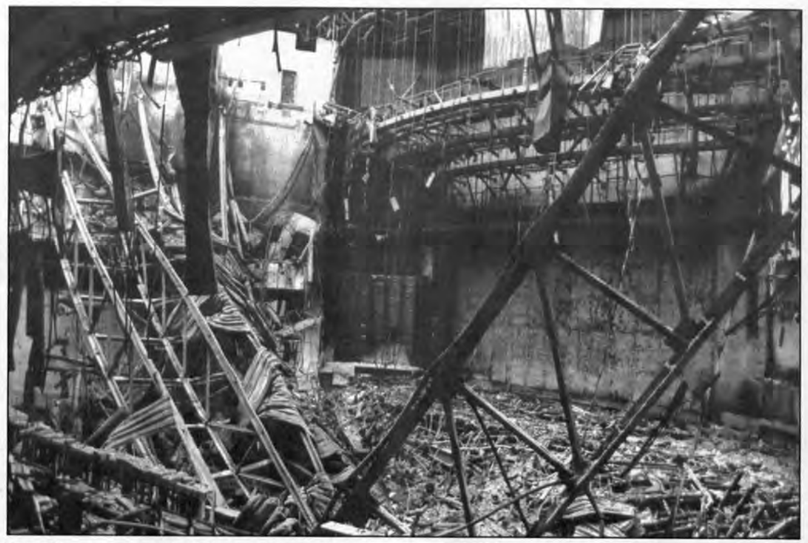
Sister programs

Maintaining a safe right of way is another important job. Lewis pointed out an image of a private pier extending into the waterway channel. "We can also use digital aerial photography, along with the right-of-way theme in our database and information from the Real Estate Office, to find and correct encroachment problems."

The AIWW GIS has several sister programs within the district as well. "FEMA Flood Ways, U.S. Geological Service road data, National Wetlands Inventory Maps, and Department of the Army Permit locations are all part of our Regulatory GIS," Lewis said. "We intend to integrate the two systems so that information from each will be available in both systems."

Navigation

From devastation of war, Corps helped bring peace, order



Corps and Kuwaiti engineers inspect damage to a Kuwaiti government building. Almost all of Kuwait's government and municipal infrastructure was heavily damaged during the Persian Gulf War. (Photos by Jonas Jordan, Savannah District)

Kuwait and American engineers inspect the Kuwait Parliament Building. From left to right are Mohamed Kharafi, a contractor; Col. David Peixotto, Commander of the Kuwait Emergency Recovery Office; Dr. Ibrahim Al-Shaheen, Minister of State for Municipal Affairs; and Bader Al-Qabandi of the Minister of Public Works. (Photo by Jonas Jordan, Savannah District)

Continued from front page

MEAPO headquarters in Winchester, Va., also established a deployment program for all volunteers that included area and safety orientations, NBC (Nuclear, Biological, and Chemical) training, and medical exams. The program was so successful that it was, at the time, considered the model for civilian deployments.

Aug. 22 – A MEAPO team with 11 members deployed to Dhahran.

Aug. 31 – Col. William Miller, MEAPO commander, deployed to Saudi Arabia to open a Corps office in Riyadh to support U.S. Central Command (USCENTCOM).

By the end of August, about 100,000 U.S. troops had arrived in Saudi Arabia.

September

Hussein, after occupying Kuwait for one month, called for a holy war against the U.S. and other countries opposing him. He later threatened to destroy the oil fields of the Middle East and draw Israel into a war if Iraq found itself strangled by U.N. sanctions.

The governments of Saudi Arabia and Kuwait agreed to devote billions of dollars to underwrite the American military deployment, now estimated at about 150,000 troops.

The Corps continued to augment its regional contingency construction management team in Saudi Arabia. This team combined and prioritized the requirements for construction and real estate for all armed forces in the theater.

Sept. 2 – Miller and Cox met with the director of the Saudi General Directorate of Military Works and USCENTCOM officials to discuss support to operations in the region.

Sept. 12 – The Corps awarded $12 million in service contracts for field showers, burnout latrines, washstands, and aircraft sunshades.

Sept. 28 – The first major construction contract to support Operation Desert Shield was awarded, a $26 million contract for life support areas.

October

After two-and-a-half months, the U.S. embargo began to damage Iraq's economy, shutting down oil exports, inflating consumer prices, and closing factories.

Oct. 9 – Kuwait's ambassador to the U.S. sent a letter to President Bush requesting assistance.

Oct. 17 – Maj. Gen. James Ray, Director of Military Programs, and his team arrived in Riyadh to negotiate the host nation support agreement with the Saudi Arabia government. The agreement provided for Saudi Arabia to support U.S. forces, substantially changing the Corps' role in supporting Operation Desert Shield. For new construction, the Corps prepared a requirement package and materials list to be turned over to the Saudi Joint Forces Support Unit for award, with the Corps providing quality assurance.

Oct. 31 – The agreement was signed, and the Saudi government made its first payment to the U.S. for $760 million.

November

Nov. 1 – The Corps had completed 97 lease actions totaling more than $90 million. MEAPO assumed full responsibility for recruiting Corps personnel for Desert Shield. More than 700 Corps members in 65 career categories volunteered to deploy to Saudi Arabia.

Nov. 7 – U.S. President George Bush announced deployment of additional U.S. forces.

Nov. 29 – The U.N. Security Council authorized the use of force against Iraq unless it withdrew from Kuwait by Jan. 15, 1991.

December

Dec. 18 – USCENTCOM tasked MEAPO to develop a cost reimbursable contract to be awarded by the Government of Japan/Gulf Peace Fund for engineering and construction services to support Operation Desert Storm.

January

By January 1991, the Allied coalition reached 700,000 troops, including 540,000 U.S. personnel, smaller numbers of British, French, Egyptian, Saudi, and Syrian forces, plus several other national contingents. But Hussein refused to withdraw his forces from Kuwait, and maintained that it would remain a province of Iraq.

Grafetti on a building sums up Kuwaiti feelings about American intervention in the Persian Gulf War. (Photo by Jonas Jordan, Savannah District)

Jan. 3 – Lt. Gen. Henry Hatch, Chief of Engineers, met with Dr. Ibrahim Al-Shaheen, Deputy Director of the Kuwait Task Force, to discuss Corps support to the reconstruction of Kuwait.

Jan. 4 – The Corps received the first formal request from the government of Kuwait for emergency management assistance.

Jan. 14 – The Corps accepted a $46.3 million Foreign Military Sales case to provide 90-day emergency assistance to Kuwait.

Jan. 15 – Col. Ralph Locurcio, Savannah District commander, was named commander of the Kuwait Emergency Recovery Office (KERO). He and others from throughout the Corps worked out of an office at MEAPO to build a task force of Corps employees trained and ready to deploy to Kuwait as soon as the country was secure.

The Persian Gulf War began on Jan. 16-17, 1991, with a massive U.S.-led air offensive against Iraq that continued throughout the war. During the next few weeks, this aerial bombardment (Operation Desert Storm) first destroyed Iraq's air defenses, then attacked its communications networks, government buildings, weapons plants, oil refineries, bridges, and roads.

Jan. 28 – A KERO advance party deployed to Dhahran, where contracting actions and logistical purchases for the reconstruction were completed.

February

By mid-February, the Allies had shifted their air attacks to Iraq's forward ground forces in Kuwait and southern Iraq, attacking and destroying their fortifications and armored vehicles.

Feb. 24 — The Allies launched a massive ground offensive called Operation Desert Sabre northward from northeastern Saudi Arabia into Kuwait and southern Iraq. Within three days, Arab and U.S. forces retook Kuwait City in the face of crumbling Iraqi resistance.

Meanwhile, the main U.S. armored thrust drove into Iraq some 120 miles (200 kilometers) west of Kuwait and attacked Iraq's armored reserves from the rear. By Feb. 27 these forces had destroyed most of Iraq's elite Republican Guard units after the latter tried to make a stand south of Basra in southeastern Iraq.

By the time that Bush declared a cease-fire for Feb. 28, Iraqi resistance had completely collapsed.

The Allies lost about 300 troops in the conflict. There are no official figures for Iraqi losses. Estimates of the Iraqi troops in Kuwait range from 180,000 to 630,000, and estimates of Iraqi military deaths range from 8,000 to 100,000.

Feb. 28 – As a result of a reorganization, MEAPO was renamed the Transatlantic Division. (It was renamed again as the Transatlantic Programs Center [TAC] in November 1995).

March

March 3-4 – At the request of the Kuwaiti government, the contracting process was expedited, and eight contracts were awarded to support the emergency recovery program before the Corps' entry into Kuwait City.

March 4 – About 40 Corps employees and 40 Kuwaiti engineers drove from Saudi Arabia into Kuwait City to begin providing emergency assistance. The team performed damage surveys and assessments and managed emergency repairs for Kuwait's shattered infrastructure.

The emergency phase lasted 90 days – electricity was restored, water supplies were reconnected, the sanitation system became partially operational, roads were cleared, and airport operations were restored during daylight.

Recovery

Following the emergency phase, the Government of Kuwait requested that the Corps remain to assist with permanent infrastructure recovery, which included additional work in these areas, plus substantial repairs on government and public buildings.

The majority of the civil repair work, totaling about $330 million, was completed by August 1992. During this time, the Corps assisted with the emergency reconstruction of Kuwait's two air bases.

The present

Today, TAC's efforts in Kuwait focus on providing design and construction expertise to the Army and Air Force, which use facilities in Kuwait under country-to-country agreements. About two dozen Corps people work in Kuwait. The Installation Support Office provides operations and maintenance services to the Army Director of Public Works at Camp Doha, and to the Air Force Base Civil Engineers at Al-Jaber and Al-Salem air bases.

The Kuwait government has awarded contracts for an installation being built for U.S. Army use south of Kuwait City, and the Corps is providing quality assurance during construction.

(Much of the information in this article came from TAC newsletter archives and from 1999-2000 Britannica.com. The TAC Public Affairs Office also contributed to this article.)

Gulf War had its own lingo

(Like all major conflicts, the Persian Gulf War had a unique lingo. Many Corps people served in the Gulf; call yourself a Gulf War veteran if you recognize these terms from "War Slang," by Paul Dickson.)

Bedrock – Giant U.S. tent city in Saudi Arabia.

Big red – The brutal desert sun.

Chocolate chips – Desert camouflage uniform.

Cultural bonding officer – An officer with the job of preventing soldiers from offending Saudis.

Desert Shield bar – A heat-resistant chocolate bar produced by Hershey Foods.

Emerald City – King Khalid Military City in Saudi Arabia.

Escan Village – Quarters for troops in Riyadh.

Goat rope – A confused situation.

Go chemical – To use chemical weapons.

Good to go – Fit; competent; ready to perform.

Grunt – An infantryman.

Hair on fire – Excited.

Highway of Death – The road from Kuwait to Iraq where allied aircraft destroyed hundreds of Iraqi vehicles. Also called the "Killing Fields."

Hoo-Ah! – An all-purpose expression of enthusiasm for almost any situation where the speaker is alive and well. The signature call of U.S. ground forces.

Humvee/hummer – High-mobility multi-purpose wheeled vehicle. The successor to the jeep and the most common vehicle in the Persian Gulf.

Hunker down – To take cover during an attack.

Jeddah gin – Bootleg booze made from potatoes. Terrible stuff, but welcome in a culture where alcohol is forbidden.

JIB – Joint Information Bureau; established in major hotels to brief the press.

Jihad – Muslim holy war.

Kevlar – Synthetic fabric used to make armor.

Klick – A kilometer (1,000 meters, .62 mile).

K-mart – Kuwait.

KSA – Kingdom of Saudi Arabia.

Lifer juice – Coffee.

Life support area – A military base. This Pentagonese was familiar to Corps personnel, but seldom used by soldiers.

MOPP — Mission-oriented protective posture, i.e., full chemical protective gear including gas mask.

Mother of all battles – Saddam Hussein's term for the ground war. This "mother of all cliches" became the first great catch phrase of the 1990s.

MRE – Meal, Ready to Eat. The standard American field ration.

No clue – Confused or lost.

Not a problem – A positive expression, refers to getting the job done.

Provide Comfort – The air operation to drop relief supplies to Kurdish refugee camps in Iraq.

Purple suiter – A military person assigned to a joint services command.

Q-8 – Kuwait.

Saddam Insane – Saddam Hussein. Also called "Saddy," "Sammy," and the "Baghdad Buffoon."

Sandbox – Saudi Arabia and Kuwait, from their sandy terrain.

Scud – A Russian-made ballistic missile.

Shield-107 – The Armed Forces Radio station operating in the combat zone.

Slimed – To get hit by chemical weapons.

Stormin' Norman – Gen. Norman Schwarzkopf, the U.S. commander.

Turn'n'burn – Rapid refueling and rearming of an aircraft, often without turning off the engine. Referred to any action carried out quickly.

Wadi – A dry river gulch in the desert which can flood quickly during a rain.

Web gear – Tools and pouches carried on web belts, and the belts themselves.

Seattle rebuilds century-old jetty

By Patricia Graesser
Seattle District

At the south end of what is now Ocean Shores, Wash., the U.S. Army Corps of Engineers set out a century ago to tame the Pacific Ocean. To provide a less hazardous route for shippers to enter Grays Harbor ports, the Corps sought to force harbor outflow into a single channel that would self-scour with its own volume and velocity.

To direct harbor outflow, Seattle District built the south jetty at Westport in 1902 and the north jetty at Ocean Shores soon after. By 1910, the Corps had completed a north jetty, originally 10,000 feet long and an elevation of plus five feet mean lower low water (+5 mllw). Between 1910 and 1913 the Corps extended the jetty to 17,200 feet, and in 1916 the Corps raised its height to +8 mllw. During 1941 and 1942, an 8,228-foot section was built to +20 mllw.

After decades of ocean waves, the jetty deteriorated. By the 1970s, the north jetty required major maintenance. In 1976, the district performed a huge rehabilitation project, placing 120,000 tons of eight-ton rocks and 80,000 tons of 14-ton rocks.

By 1999, the average height of the jetty had fallen to between 16 and 20 feet, and gaps developed where the elevation was +14 feet or below.

Over time, the harbor entrance has lost a significant amount of sediment from the areas north and south of the jetty, according to a design analysis by Eric Nelson, a district hydraulic engineer. The protection once afforded by the sandbar has been lost, and ocean storm waves approaching from the southwest now pound the north jetty.

In the severe winter of 1999, storm waves more than 20 feet high widened and damaged areas of the jetty and lowered portions of the top elevation to +13 mllw. The Corps advertised a major rehabilitation project last April and awarded a contract last July, originally for $6.2 million, to Roglins, Inc., a local contractor.

Before beginning construction, the Corps and Roglins resolved public concerns regarding the project's potential impacts to local roads. Trucks would be hauling huge, heavy rock along seven miles of city roads, and the city's residents didn't want to suffer potential consequences.

A mobile crane places a 14-ton stone while a heavy trailer brings in another one. (Photo courtesy of Seattle District)

To dispel worries, Seattle District and the contractor negotiated a deal in which Roglins would smooth some existing dips in the road before hauling began, and would be responsible for repairing hauling damage to the roads during and after construction.

This season's rehabilitation project included placing 57,100 tons of class A (14-ton) rocks and 10,400 tons of smaller stone. Congressional funding for the rehabilitation work ended up short of the original contract – down to $4.3 million. Nevertheless, the rehab brought a large section of the jetty up to a height of +23 feet. The added height won't prevent flood damage, but it should reduce the volume and intensity of water overtopping during storms.

Rock hauling wrapped up at the beginning of January, according to project manager Mark Howard and resident engineer Bill Brooker.

"The city is real pleased," said Howard. "And for all the concerns beforehand, we received no real complaints."

Float-in technology used to extend lock

By Steve Wright
and David Conley
Huntington District

Extending the auxiliary lock chamber at Greenup Locks and Dam on the Ohio River would have been easier and perhaps less expensive using float-in technology. The obstacle was the river's depth, according to design engineer David Conley.

"Bedrock at Greenup is 15 feet below the lower pool elevation and we need a minimum of 25 feet to float-in the (concrete) lock wall extensions," Conley said. So Huntington engineers chose a different approach to extend the existing auxiliary 600-foot lock chamber another 600 feet with minimal disruption to Ohio River navigation traffic.

They plan to use lift-in technology. The chamber walls will be built on-site using 125 pre-cast concrete building blocks and wall panels, and the district proposes to lift them into place with a 350 to 400-ton floating crane.

The lock chamber extension will extend the landward auxiliary lock wall 600 feet and the middle wall between the two lock chambers 145 feet, and includes a new miter gate on the downstream end of the extended chamber.

The primary element of the extension is towers that are 21 feet square, 36 feet high and spaced 11 feet apart. After these towers are placed and filled with concrete, the extended lock chamber walls are developed around them. The tower is a pre-cast building block weighing 325 tons, although the heaviest piece is not solid. It has a hollow framework divided internally by one-foot thick walls into four nine-foot-square chambers or shafts 36 feet long. The external walls of the 21-foot square tower are also a foot thick. As a result, framework towers weigh only 25 percent of what they would weigh without the four hollow shafts. This makes them easier to lift and place.

Navigation

Before placing the towers, an average of three feet of cracked, fractured, or weathered bedrock is excavated. The tower is lifted in by the floating crane and placed within the wall alignment. The horizontal placement accuracy is plus or minus 12 inches. The towers will have four hydraulic legs for vertical positioning. These hydraulic legs will compensate up to three feet for vertical alignment.

Concrete placement. Once the tower is aligned, sandbags will be placed around the base to seal the bottom of the tower. The first concrete lift of five feet will plug and seal the base of the structure and grout it to the bedrock. This concrete will be placed underwater using the tremie (pipe-in) method.

The second placement will fill each shaft in a single 31-foot lift. At this point when the shafts or chambers are filled, and the tower mass will increase from a 325-ton pre-cast framework to 1,200 tons. In total, 23 towers will be built to complete the chamber extension — 17 on the landward wall, four to the middle wall, and two end or bullnose towers to complete each of the walls.

Pre-cast wall panels. Each pre-cast tower will have corbels or extensions to which wall panels will be attached. The pre-cast wall panels with corresponding corbels are 32 feet long, 40 feet tall, 1.5 feet thick, and weigh 150 tons. These corbels allow the towers to have a horizontal placement of plus or minus 12 inches. The wall panels serve two functions. They form the lock chamber wall, and they act as stay-in-place formwork for concrete lifts. The final alignment of the wall panels must be within plus or minus half an inch to form a smooth chamber wall. The panels will also contain wall armor and required items like mooring bits.

Once panels are fastened to the towers by the corbel extensions, the area between the towers and panels will be filled with tremie concrete. Typical construction would use several 10-foot thick horizontal lifts of concrete. But the district plans to rotate the lift to form a single eight-foot-wide, 30-foot-tall vertical lift to fill the cavity. After this, the remaining cavity will be completed with conventional cast-in-place concrete. With the extended lock walls complete, new miter gates will be installed.

This lift-in method of building lock walls provides important cost-savings benefits. Since the lift-in approach can be accomplished underwater, there are considerable savings in eliminating a cofferdam. Cofferdams are steel sheet walls that form a dam around a construction area in the river. The water behind the walls is pumped out so construction can take place in the dry. Eliminating the cofferdam alone saves $15-20 million. More important, a cofferdam would close both chambers for two to three years, causing severe impact to the shipping industry.

The only remaining alternative is to build a new lock chamber landward of the existing chambers. This would cost about $350 million. So, using new in-the-wet building methods cut the cost of the Greenup project in half.

Another cost-saving feature is that lift-in construction allows a series of short closures, instead of one long closure. Current plans call for two 27-hour, five 40-hour, and several 12-hour closures. After each closure, backed-up barges will lock through before the next shutdown.

A second state-of-the-art construction feature of the Greenup lock chamber expansion is the extension of the approach walls. These walls extend beyond the lock chambers to shield tows from river currents and to help align the tows so they can enter the lock chambers.

Floating concrete. These will be permanent floating concrete walls. The walls will be built of concrete box-like pontoons. These walls will range in length from 250 to 1,300 feet long, 38 to 42 feet wide, with a height of 15 feet. The internal pontoon structure is a series of watertight chambers 20 feet long.

The floating walls will be held in place by two pylons, one at the existing lock wall and the other at the nose pier at the far end of the wall. The pylon height is set eight feet above the 1937 flood of record. This allows the floating walls to rise and fall with the level of the river. Four floating walls are proposed — a 1,300-foot upstream middle wall; a 1,300-foot upstream guard wall; a 1,135 foot downstream land wall, and a 250 foot downstream guard wall.

If the project starts on schedule, construction could begin in FY03. The cost projection is $175.5 million.

Winter ice is major problem in locks; CRREL models examine solutions

By Andrew Tuthill
CRREL

The Soo Locks at Sault Ste. Marie, Mich., allow deep-draft vessels to pass from Lake Superior to the lower Great Lakes and St. Lawrence River system. Although the locks are closed to winter-long navigation, operators face serious ice problems when the locks reopen in early spring.

Broken lake ice pushed ahead of downbound ships can make it difficult or impossible for the vessels to enter the locks. Existing solutions such as locking the ice separately through the main lock or an adjacent smaller lock result in delays and increased costs to the navigation industry.

The vessel *Stewart J. Cort* travels through Poe Lock under heavy ice conditions. (U.S. Army photo by Allen Jewell)

Models

A physical model study conducted at the Cold Regions Research and Engineering Laboratory (CRREL) examined a range of alternatives to improve ice passage at the Soo Locks. Engineers built the 1:36 scale physical model in CRREL's Refrigerated Research Facility. This model included the 1,200-foot-long, 110-foot-wide Poe Lock, the adjacent 800×80-foot MacArthur Lock, plus the upstream approach canal.

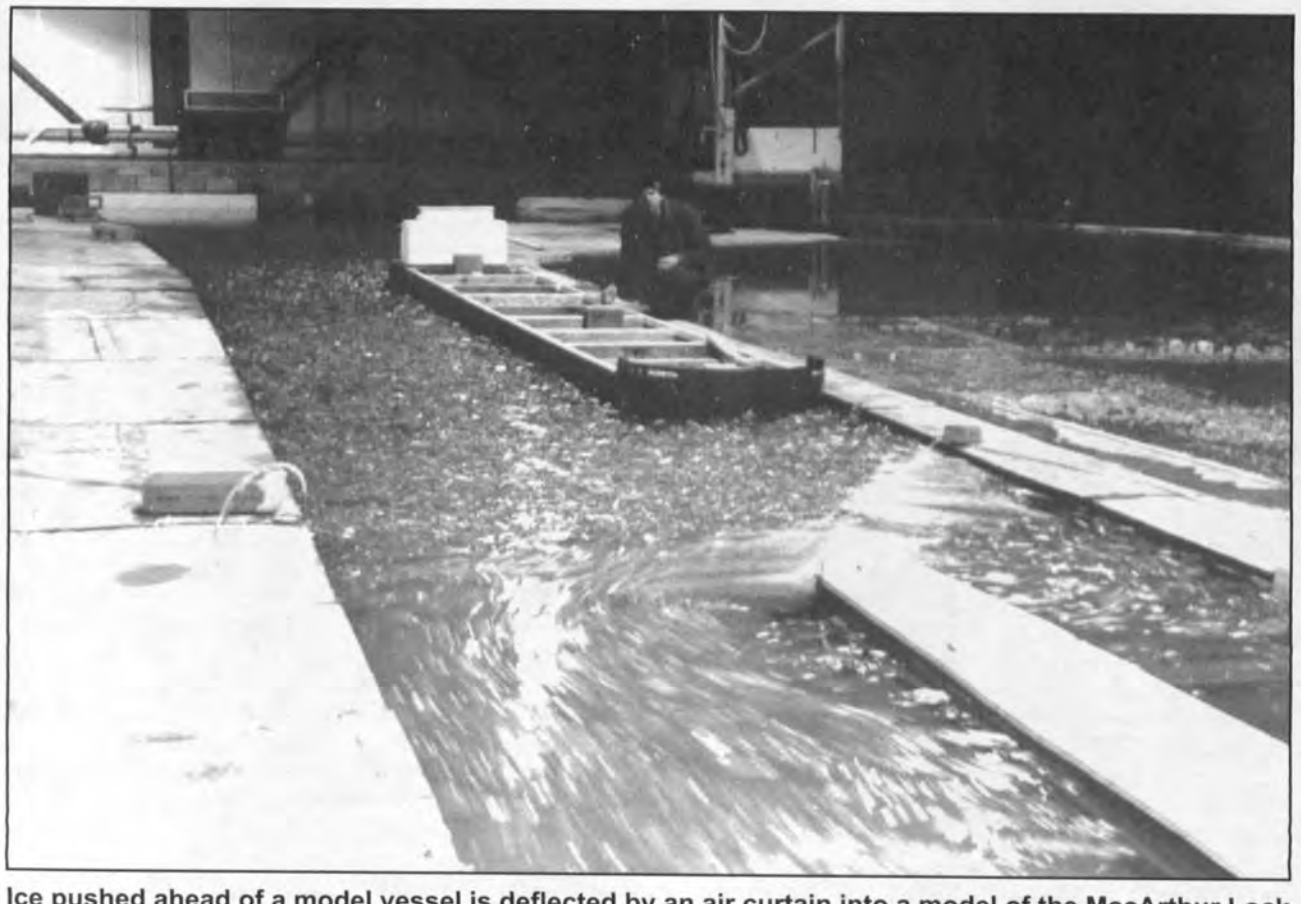
Model tests evaluated the performance of high-flow air curtains to deflect broken ice accumulations away from the entrance to the Poe Lock. Air curtain arrays and point source bubblers were also tested for breaking ice jams in the upstream approach of the MacArthur Lock, and high-flow point source bubbler arrays were developed in the model to relieve ice congestion in front of the downstream miter gates of the Poe Lock. Researchers also tested a model water cannon for clearing ice and breaking jams.

Deflectors

Of the alternatives tested in the model, the deflector curtain has the greatest potential for relieving the ice problems at the Soo Locks. Deflecting heavy ice accumulations was possible in the model only if a relatively ice-free receiving area was maintained in the approach to the MacArthur Lock. Additional compressor capacity would be needed to deflect thick accumulations of ice, and a diffuser manifold resistant to vessel propeller wash would have to be installed in the wet.

Model tests demonstrated that adding two high-flow, point source bubblers would relieve the ice congestion in front of the downstream miter gates of the Poe Lock and reduce the need for gate fanning. One bubbler would be located at the gate nose, and the second 60 feet in front of the gate nose. The point source bubblers would operate together with the existing miter gate recess bubblers.

To maintain an ice-free receiving area for ice deflected from the entrance to the Poe Lock, ice must be flushed through the MacArthur Lock. Although currently not feasible in the prototype, skimming surface water and ice over the emergency bulkheads of the MacArthur Lock was an extremely efficient ice clearing method in the model.



Ice pushed ahead of a model vessel is deflected by an air curtain into a model of the MacArthur Lock approach. (U.S. Army photo by P. Keene)

Prototypes

Jams in the tapering portion of the MacArthur Lock approach hinder ice conveyance into the MacArthur Lock chamber. To solve this problem, point source bubblers were located at intervals along the channel sides and deployed sequentially from downstream to upstream to dislodge the jams.

Last winter during a lock dewatering, point source bubblers were installed in front of the downstream miter gates of the Poe Lock. This March, when the navigation season reopens, CRREL engineers will be at Soo Locks to monitor their performance and compare prototype and model results.

At this point, if the early winter weather is any indication, there should be some serious ice conditions during the early part of the 2001 navigation season.

(Andrew Tuttle is a research engineer with CRREL.)

Navigation


Jonas Jordan Photo

Navigation

Keeping the Nation's Harbors and Waterways Operational

Miss. River copes with major oil spill

By John Hall
New Orleans District

The U.S. Army Corps of Engineers played a multi-part role in helping the Coast Guard, navigators, and government scientists cope with one of America's largest oil spills since the Exxon *Valdez* made history in 1989.

The 890-foot tanker *Westchester* spilled 544,400 gallons of Nigerian crude into the Mississippi River after striking an unknown object on Nov. 28, about 57 miles downriver from New Orleans.

New Orleans District's contributions included:

- Supplying data to help the National Oceanic and Atmospheric Administration (NOAA) track the oil's subtler movements.
- Deploying a sonar-equipped boat to scan for objects that may have ruptured the *Westchester*, and to re-survey bottom contours.
- With traffic halted on the Mississippi, the district re-routed one-and-a-half months' worth of ocean-bound ships through an already busy Corps lock in 24 hours.

Cooperation

"This port benefited by such quiet, behind-the-scenes cooperation from many agencies," said J. Ron Brinson, president of the Port of New Orleans. "The Corps of Engineers helped navigation return to normal in America's greatest port complex and aided the environmental work as well."

The outbound ships used the Industrial Canal Lock in New Orleans to reach open water via the Mississippi River-Gulf Outlet, a 70-mile-long, Corps-built waterway.

"On Nov. 29-30, we handled 27 lockings [the average] in 24 hours, plus six ships. This is 50 percent more ships than we normally have in a month," said David Labruzzi, the head lock operator.

Only mini-ships can use the lock's 625-foot chamber, but passing them takes 45 minutes, almost twice the time required for the inland barges and towboats that are the lock's main users. Larger ships, including some turned away by lock operators, were forced to remain at river wharves or anchorages until the Coast Guard re-opened the Mississippi.

Sonar boat

The *Westchester* spill occurred near Port Sulphur. Around the area, the *W-46,* one of the district's survey boats, searched with side-scan sonar and determined water depth with hydrographic survey equipment.

"We didn't find anything that could have been the cause of the ship's hull rupture," said Gregory Breerwood, Assistant Chief of Operations. "We did determine that the bottom contours are the same as shown on hydro charts and used by pilots. The shipping channel is wide and deep, and there has been little change in the river bottom in the area for a long time."

Helping NOAA

Within 10 days, most of the oil was stranded on shorelines within 10 miles of Fort Jackson, or 18 miles below the spill. In addition to dispersion, some of the light oil was evaporating.

That left a major, potential hiding place that worried people from NOAA's Hazard Materials Response Division in Seattle, Wash. — How much oil was going to the bottom through a process known as sediment scavenging? Oil molecules can attach to sedimentary particles and sink.

"We needed data" to understand how dispersion, evaporation, and scavenging were divvying up the oil, NOAA's Marc Hodges said. "As temperatures and salinities increase, both dispersion and scavenging increase."

New Orleans District's Hydraulics and Hydrologic Branch helped track down the data. Rodney Mach correlated chloride concentrations and flows along the river that helped NOAA to determine surface salinity. And Jerry Gogreve came up with historical data and local expertise about the seasonally low river flow at the time.

"Based on this data and real-time observations, we were able to rule out concerns about significant quantities of oil being lost subsurface," Hodges said.

Another significant Corps contribution helped deal with the oil's being stranded at the outset by the highest tide for two weeks to come. The Corps' "important information provided the Incident Command with potential timing on when stranded oil might be refloated," said NOAA's Debbie Peyton.

Results

By Dec. 28, hundreds of workers were completing the Coast Guard's clean up. Oil was blamed for the deaths of seven birds, and wildlife people cleaned 13 more. Recovery crews collected more than 555,000 gallons of oil emulsified with water and 2,218 tons of oily sand.

The tanker *Westchester* struck an obstacle and spilled 544,400 gallons of oil into the Mississippi River. (Photos courtesy of New Orleans)

High-tech system saves lives, property

Communities along two flood-prone river systems in West Virginia are turning to Pittsburgh District for innovative early-warning systems to save lives and protect property. Working with the West Virginia Office of Emergency Services, the district has shown that non-structural alternatives can reduce flood damages at far lower cost than large-scale reservoirs. In 1988, the district implemented a linked system of stream and rainfall gauges, plus computerized forecasting software, along the Cheat River. Now, another system has been designed to serve in the Tygart River Basin, with completion in late 2001.

Both systems provide from six to 10 additional hours of warning of flood crests, enough time for local governments to plan building and street closings or complete evacuations. For some small communities in the steep mountains of Northern West Virginia, this extra warning time can mean the difference between life and death.

Engineers have long realized that massive flood control reservoirs are simply not feasible for protecting small communities such as Belington and Philippi, W.Va. Cost-benefit studies generally cannot support such large construction projects, and residents understandably want protection *now,* not in the 9 to 15 years that it could take to build a dam. Often, suitable locations for dams do not even exist in the rugged mountains.

For Philippi and Belington, the current limited system of National Weather Service (NWS) rain and river gauges can not provide sufficient flood warning, since threatening conditions in the remote headwaters may still go unnoticed. Last February proved this when a 10-year flood event crested before residents could move themselves or belongings to higher ground.

To help solve the problem, Pittsburgh District turned to technology it used a few years ago in the Cheat River basin, also in West Virginia. Fully designed and built in just 18 months for $500,000, the district's first such system has been fully operational since March 1998 and includes state-of-the-art integration into the NWS's Integrated Flood Observing and Warning System (IFLOWS).

When a similar system is in place in the Tygart Basin, local emergency officials will receive improved forecasts and upstream condition reports. Also, they will have expanded capability to compute their own, more accurate flood forecasts. Coupled with flood inundation mapping recently completed by the Cold Regions Research and Engineering Laboratory, this valuable tool will help them assess potential flooding and initiate emergency operations.

As part of this new flood warning system, the district developed a computer hydrologic model of the Tygart Basin, using the Corps' HEC-HMS software to determine average travel times between the selected stream-gauge sites. The model was calibrated against past floods, using existing unit hydrographs and stage-discharge curves where available. In remote headwaters, synthetic unit hydrographs and curves had to be developed.

Implementing the newer system will be a genuine team effort, involving the U.S. Geological Survey, NWS, the state Emergency Office, and the cities. Reconnaissance field visits by Corps hydrologic engineering technicians were a critical link in locating potential stream-gauge sites in the Tygart Basin headwaters. Attaching gauges to existing state highway bridges where possible simplified real estate requirements.

High-tech stream gauges (left) and rain gauges with radio transmitters are part of an innovative non-structural flood damage reduction project in West Virginia. (Photos courtesy of Pittsburgh District)

Another major effort involved locating hilltop sites for additional radio repeater stations, so that signals from the new gauges can be relayed across the region. Once identified, the NWS conducted radio-path studies to confirm that the repeater sites were adequate.

The cost of the proposed system is estimated to be $600,000. It falls under Section 581 of the 1996 Water Resources Development Act, which authorized a minimum of 100-year-flood protection in certain communities and basins in south central Pennsylvania and northern West Virginia.

Eventually, levees and floodwalls will be built in Philippi and Belington under Section 581. However, the warning system offers a critical extra measure of safety for the short term. Over the long haul, it will provide basin-wide enhanced warnings, and can make a life-or-death difference in the cities, if the design flood is exceeded and levees are overtopped. Other nonstructural measures planned include raising some homes above the 100-year level in areas not enclosed by levees and floodwalls, and buyouts are a possibility, if feasible.

West Virginia is the cost-sharing sponsor of the flood-warning systems. Although they were designed primarily to benefit Belington and Philippi as directed by Congress, the sponsor can easily expand its coverage to benefit many other communities in the Tygart Basin at relatively minimal extra expense.

To improve accuracy in predicting the flood crest, the district proposed placing four new stream gauges in the Tygart headwaters. Seven existing stream gauges will be upgraded into the IFLOWS network. Two new radio repeater sites will be established to supplement four existing ones. All of the new and upgraded stream gauges and the new radio repeaters will also receive winterized rain gauges.

The new and upgraded equipment will have redundant communication systems, which are necessary because storms can disable communication when it is most needed. Besides two-way radio connection to the IFLOWS backbone, there will be satellite linkage to the NWS Geostationary Orbital Environmental Station, plus telephone communication.

The Corps will purchase new computer workstations for the two cities and the Barbour County emergency management office. A computerized capability will be developed to identify which structures will be affected by flooding and when, so that automatic warnings can be given, possibly by phone or even cable television.

As the project's local sponsor, West Virginia will be responsible for maintaining the new gauges and radio repeater stations. The NWS will continue to maintain the existing IFLOWS rain gauges.

Based on the experience in the Cheat River System, local emergency managers are satisfied with its performance to date. In fact, word of Pittsburgh District's expertise in this field has reached beyond the region. A delegation from Poland recently visited the district for advice from Corps hydrologic and hydraulic engineers on a potential similar flood warning system for the Oder River system.

(This article was a joint effort in Pittsburgh District.)

New technique saves bulkheads

By Ed Voigt
Philadelphia District

A European innovation made its North American debut Oct. 19 on the Jersey shore along the Point Pleasant Canal. This innovation, which has been in use in Europe for a number of years, is called DZI, or Dry Setting Installation. Essentially a miniature, mobile cofferdam that replaces the work of divers, the DZI allows dry inspection and maintenance of submerged structures — in this case, the steel sheet pile bulkheads that line both banks of the canal as part of the Philadelphia District's New Jersey Intracoastal Waterway navigation project.

At the heart of the DZI are its patented steel-and-rubber teeth custom-designed to fit different bulkhead shapes, that get attached to the one open side of a three-sided rectangular box. When the box is lowered into place by crane with the open side against the face of the bulkhead, the rubber pads on the teeth form a tight seal with the bulkhead. A submersible pump then removes all the water from inside the box, leaving a safe, dry space for inspectors and skilled trades to do their work.

DZI is the property of Acotec, N.V., a Finnish company incorporated in Belgium. Acotec's main business is inspection and repair of steel sheet piles, which they are doing as the district's operation and maintenance contractor at Point Pleasant in response to recent public concerns about the bulkhead's integrity.

This first U.S. use of DZI allowed Philadelphia District and Acotec to do two things at once. The first was run a comparison between sand and water blasting to see which cleans bulkheads better and faster. The second was test another Acotec product, Humidur, an epoxy-based protective coating that can be submerged immediately after application.

"We have Humidur applications in Europe that have been holding off deterioration for more than 20 years," says Acotec U.S. representative David Sciacchitano.

"DZI does several things for us," said project engineer Tom Heary of Civil and Structural (C&S) Section. "Most important, it allows for much more accurate inspection than even the most experienced divers can perform. Not only can we clearly see the condition of the bulkhead, we can also take full advantage of electronic thickness gages that tell us where the steel is about to wear through.

"Along with accuracy comes speed, Heary continued. "Setup time is more than compensated by the ease of inspecting and making repairs in the dry versus underwater. And of course the dry conditions make for faster and better results."

"The combination of DZI and the Humidur coating offer the district a tremendous cost-saving opportunity," said C&S Section Chief Tony DePasquale. "The bulkheads at Point Pleasant are reaching the end of their effective lifespan (they range from 25 to 35 years old), but this new approach can extend that lifespan with spot repairs instead of replacement. The long-term savings to the district? Somewhere upwards of $25 million."

Kansas engineer is part-time rocker

Randy Kuzniakowski plays lead guitar with the *Lost Dog!* rock band.

Article and Photo
By George Hanley
Kansas City District

In the world of rock and roll, lead guitar is the point man for solos and is always in the limelight. He's the one whose music is most prominent on the recordings, who gets in all the photos. It's a position that most people have probably fantasized about, even if only briefly.

Randy Kuzniakowski, a civil engineer with Kansas City District, is living that fantasy, even though he would be voted *least* likely to be a drug-free Jimi Hendrix. The 11-year KCD veteran is quiet and deliberate – good qualities for an engineer, but not a great fit for a career path famous for outrageous behavior.

The *Lost Dog! Band* traces its name to two sources — Kuzniakowski's habit of taking in stray dogs, and the signs found on every subdivision's lamp poles – "LOST DOG." *Lost Dog!* Is currently a four-piece band playing in the Kansas City area. They play most popular rock-and-roll cover songs from the 1970s up through today's music. Other band members are Kent Allen on the keyboard, Jim Hillard on bass, and Paul Allen on drums. "Of all the members, I have the *least* playing experience," said Kuzniakowski. "I feel lucky to have hooked up with the great group of players that comprises *Lost Dog!*"

The trail to local fame has not been short, easy, or even profitable. It has been a labor of love that began in Kuzniakowski's teen years. He just played with friends and at parties for 10 years or so, and experienced a renaissance in 1995 when he hooked up with a keyboard player. That was the bare-bones beginning of *Lost Dog!* Kuzniakowski played his first professional gig (the pay was free beer) in suburban Lee's Summit, Mo., two days before leaving for a year to work on a master's degree at Virginia Tech.

Professional engineers (even star professional engineers) don't get much chance for the kind of raucous adulation that rock stars get. Kuzniakowski's professional engineering career began with the district in 1989 as an intern freshly minted at the University of Missouri at Rolla. He rotated through various divisions, with his biggest project being construction oversight for a buried collector system for seepage through the foundation at Kanopolis Dam. For several years, he worked on the Brush Creek Project in Kansas City, and he is currently working on a remediation of the stilling basin at Wilson Dam.

So Kuzniakowski has done well as an engineer, but those projects offered few (if any) opportunities to be the center of attention or adulation. It's 'way different playing lead guitar for *Lost Dog! Band.* "I'll never forget the first time the band was flashed," Kuzniakowski said. According to one member of his retinue, Kuzniakowski "has developed a troupe of adoring female fans who faithfully attend the *Lost Dogs!* gigs just to see him play."

Despite all the attention, Kuzniakowski still sees rock and roll as a hobby. "I do this just for fun," he said. "Engineering pays a lot better at this point in my life."

That could change overnight. The group has already recorded an original song, "*Under*," for friends. A supporter believes Kuzniakowski is "one of the hottest and most attractive guitar players on the Kansas City music scene. He is destined for rock star fame."

Corps man plays champion handball

Article and Photos
By Bill Peoples
Nashville District

Whack! Whamp! Uggah!

A man dressed in a white t-shirt, red shorts, eye protection, and fraying leather gloves flings himself across a hardwood court to hit a small blue ball as he avoids running into his opponent or the wall.

Well, most of time. The *"Uggah!"* was him slamming into the wall.

While many Corps employees prefer milder recreation, Dave Hendrix, team leader for the Flood Plain Management Services Section, is a handball player. He gets his exercise whacking a small ball around a court 40 feet long, 20 feet wide, and 20 feet high, with a back wall 12 to 14 feet high.

Hendrix is very good, having recently won the Tennessee State Handball Tournament in singles and doubles for his division.

"I've been playing since my freshman year in college," said the 43-year-old engineer. "I was trying to find a phys ed class, and handball was the only thing open. I really enjoyed it and had a knack for playing it. I play in the B level, which is the next level down from the Open level where the professionals play."

Handball is one of the oldest ball games and can be traced back to the baths of Rome. As the name implies, you hit the ball with the palm of the hand, although the back of the hand can be used. Gloves must be worn to prevent moisture from affecting the ball. The immediate forerunner of the modern game was developed in Ireland about 1,000 years ago. In the modern game, the ball, the four-wall court, and the scoring system was developed in the 1800s, and came to America in the 1880s.

(Left)Dave Hendrix demonstrates his power serve. (Right) Hendrix concentrates as he catches the ball off the back of the court.

The ball is made of rubber, measures almost two inches in diameter, and weighs about 1.5 to 1.75 ounces. The game is played to 21 points, and requires a combination of skills that few other sports demand.

"You have to have good hand-eye coordination," said Hendrix. "You have to be able to use both hands. You need a combination of dexterity, speed, endurance, power, flexibility, and quickness to cut shots off the wall. It's also a mental game. You have to anticipate, based on the shot you hit, what the other guy will be able to do, and what do you need to do next. It takes both physical and mental abilities to win."

Since racquetball came along, there are fewer handball players around, said Hendricks. In Nashville, there are about 45-50 who play regularly, and most of them play at the Downtown YMCA.

"I try to play twice a week," said Hendricks. "If I'm getting ready for a tournament I'll throw in a couple extra times. My body can't stand more than two or three real hard days. The joints don't last as long as the rest of you does."

Hendricks has been playing in handball tournaments since college and says it is just his competitive nature. As in any sport, how one practices and plays in a tournament are different.

"In tournament play, you spend the first part of the first game figuring out what the other guy's weaknesses are," said Hendrix. "If you ever get somebody that has a weak spot on the court, in tournament play you'll hit it there every time. You're playing to win and win as easily as you can. You can play as many as five or six matches in a weekend. We play the best-out-of-three matches. If you keep them down to winning those first two games, it is really important as the weekend goes on. The biggest difference between tournament play and everyday play is that in a tournament you find the other person's weakness and hit it there every time. In practice, I'll work on a variety of shots and so will my opponent."

When he's not playing basketball, golf, and handball, Hendrix is the floodplain management expert for Nashville District. According to Hendrix, floodplain management has grown rapidly as more opportunities open up to provide these services to more people, so the tenacity he has developed playing handball pays off in his job.

Hendrix's next athletic challenge involves kids.

"I want to help start a youth program for handball at the YMCA in Murfreesboro," said Hendrix. "There are fewer and fewer people playing the game and there are not that many places to play. It's such a great game that I want to help pass the sport along to others. In that vein, if there's anyone out there who wants to play or learn handball, I'd be more than happy to help them get started and work with them."

Around the Corps

Engineer Dinner

The annual Engineer Dinner hosted by Lt. Gen. Robert Flowers, Chief of Engineers, is set for Feb. 22 at 6:30 p.m., in the Fort Belvoir Officers' Club. The cost is $34 per person, and RSVPs must be received by Feb. 14. Dress is Army mess dress or Army blue with bow tie for military, and black tie optional for civilians. This invitation is open to all active duty, reserve, National Guard, and retired engineer officers. For more information, please call the Protocol Office at (202) 761-0045 or 1220.

Cost Engineer of the Year

Karen Schofield of Planning/Engineering in New England District is the Corps' Cost Engineer of the Year. The annual award is given to one cost engineer, military or civilian, in recognition of his or her contribution to the cost engineering profession.

Karen Schofield is the Corps' Cost Engineer of the Year. (Photo courtesy of New England District)

Schofield was recognized for her contributions as a member of the national subcommittees responsible for developing the TRACES Unit Price Book, and M32, the next generation software for cost-estimating.

She received the award at the Tri-Services Cost Engineering Committee Conference in Las Vegas.

Project delivery award

Two Huntsville Center teams were recognized at the recent Corps' Project Delivery Team Conference in Seattle. The Energy Savings Performance Contracting Team earned the Project Delivery Team Merit Award, and the Russian (chemical demilitarization support) Team earned an honorable mention.

The Energy Savings Performance Contracting Team serves 48 customers. The team works in partnership with its customers, Corps districts, and contractors to leverage private investment in infrastructure improvements that produce energy conservation savings. The resulting energy cost saving is shared between the government agency and the contractor.

The Russian Team has the mission of jump-starting the destruction of chemical weapons for the Russian Federation. The team is helping the federation design and build a facility to destroy chemical weapons. They operate under the Cooperative Threat Reduction Program, created in 1991 to reduce the threat from weapons of mass destruction produced by the former Soviet Union.

New environmental newsletter

The first edition of *The Corps Environment* is now available for Corps employees and others interested in the Corps' environmental work.

The 16-page quarterly publication, a product of the Directorate of Military Program's Environmental Division, focuses on the environmental work performed by the Corps as a whole. It is a combination of two former Corps publications, *The Restoration Reporter* and the *Ordnance & Explosives Environment.*

The first issue, which came out in mid-January, is available in print, through e-mail to Corps employees, and on the worldwide web at http://hq.environmental.usace.army.mil/newsinfo/The_Corps_Environment.pdf. It also is available on the Defense Environmental Network and Information eXchange, DENIX.

The next issue is slated for April. To contribute an article, contact Kimberly Gillespie, editor of *The Corps Environment,* at Kimberley.C.Gillespie@HND01.usace.army.mil.

Rescue

Joe Stutzer, an electrical repairman at Foster Dam in Portland District, was walking across nearby Green Peter Dam when he spotted someone in the water and rushed down the embankment to his aid.

Leo Billman, driving by on the road that crosses the dam, parked his car, and also went to help. He found Stutzer helping the man keep his head above water, but unable to pull him onto the steep, rocky shoreline. Stutzer asked Billman to keep the victim's head above water, then ran to the dam to call other crew members to help.

The Foster Dam maintenance crew (who were working at Green Peter Dam that day) got rope, a stretcher, and blankets, then went to help. Billman was still supporting the man when they arrived. Ray Bonneville, Bill Smith, and Stutzer tied the man onto the stretcher, and the rest of the crew stayed above the bank to pull the stretcher to safety.

The man was in his 80s and had been fishing when rocks underfoot slipped and he fell into the reservoir. He was cold, slightly disoriented, and had a minor cut on his hand, but otherwise appeared in good condition. Bonneville and John Gross drove the man to the Sweet Home fire department and left him with the paramedics.

Hammer Awards

Charles Korhonen, a research civil engineer with the Cold Regions Research and Engineering Laboratory (CRREL), and National Public Lands Day, have received the Vice President's Hammer Award. The award recognizes government workers or teams who put customers first, empower employees, cut red tape, and get results.

The Tennessee Valley Authority (TVA) faced a dilemma at the Sequoyah Nuclear Power Plant near Chattanooga, Tenn. The concrete floors in its ice-storage rooms had heaved from frost and needed repair. But the work had to be done under tight time constraints during a nuclear refueling outage, and at minus eight degrees centigrade. Ordinary concrete cannot cure under those conditions. Shutdown of the ice-storage rooms was not acceptable, since each day down cost $1 million in lost revenue.

Korhonen, working with TVA, Singleton Labs, and a private material and concrete construction consultant, developed a concrete that could be placed, consolidated, finished, and cured at below-freezing temperatures.

"This technology could extend the concrete construction season by several months in much of North America," said Korhonen. "Currently, the U.S. construction industry spends about $1 billion dollars per year for heated enclosures to place concrete at below-freezing temperatures. Much of that could be saved by adopting this new low-temperature concrete."

The Corps and eight other federal agencies, plus the National Environmental Education and Training Foundation, developed National Public Lands Day (NPLD) into a nationwide celebration. The event takes place on the last Saturday in September. Federal land managers design hands-on projects for volunteers who build trails and bridges, make facilities handicapped accessible, improve buildings and wildlife habitat, remove invasive plants, restore shorelines, protect cultural resources, and perform many other projects.

NPLD has grown from one agency (Bureau of Land Management), three sites, and 700 volunteers in 1994, to nine agencies, more than 250 sites, and 30,000 volunteers last September.

Flint River

Detroit District recently rehabilitated the inflatable dam on the Flint River. They replaced the mechanism used to maintain the Flint River's water levels by removing the Fabridam and installing a new Obermeyer dam for $604,000.

V.H. Easterwood, Midlothian Water District (left); David Setzer, mayor of Midlothian; Harold Barnard, Trinity River Authority; and Col. Gordon Wells, Fort Worth District Engineer, hold the prepayment of the water district's $29,279,879.96 debt for water storage at Joe Pool Lake in Texas. The river authority is the local sponsor for the lake, and committed almost 40 percent of its water supply to the water district, which provides water to Midlothian. The water district pays the river authority for the water, and the river authority passes the payment to the Corps. The prepayment is thought to be the first in the Corps. (Photo by Debbie Bronson, Trinity River Authority)

The Obermeyer system uses a row of steel panels supported by inflatable air bladders. By controlling the air in the bladders, the upstream water level can be adjusted. The mechanical and electrical systems in the underground vault on the north bank will also be upgraded.

The inflatable Fabridam was installed in the late 1970s under a Corps contract. Flint, Mich., operated it for the past 20 years to maintain summer water levels in the river to protect the downtown. But the Fabridam was in poor condition and required replacement.

Artifacts

Not everything old is junk; some things are considered valuable antiques. That includes some lock equipment built at the turn of the last century and still in use in Pittsburgh District. A few navigation structures belonging to the district were placed in service almost a century ago, and the mechanical equipment is still in operation. But as the locks are rebuilt, old equipment is replaced by new.

Some of the 75-year-old equipment from Lock 5 will be displayed in a museum. (Photo courtesy of Pittsburgh District)

Lock 5 on the Allegheny River was built between 1920 and 1927 and opened for operation in 1927. Because of its age, the district and the Pennsylvania State Historical Preservation Office agreed that Lock 5's equipment should be preserved and displayed.

DASCO Inc. got the award to rehab electrical and mechanical equipment and repair concrete at Lock 5. The company salvaged the 75-year-old hydraulic system, including a water-driven turbine and shaft, pumps, and other related equipment.

The equipment is currently in storage while formal agreements are finalized with the state and the Allegheny-Kisky Historical Society in Tarentum, Pa., where it will be displayed.

'There's an angel on the mountain'

Corps biologist rescues injured hunter

By Dutch Meier
Walla Walla District

Phil Fishella (left) meets Lori and David Shield. Fishella helped rescue David Shield after Shield was shot in a hunting accident. (Photo courtesy of Walla Walla District)

The injured hunter didn't know exactly when the stranger appeared next to him. Hit in the leg by an accidental shot, David Shield was locked into pain and prayer. He couldn't see clearly through the pain, so all Shield knew was that someone was there to help, and that he seemed calm, confident, and compassionate.

"I remember thinking to myself, 'There's an angel on the mountain,'" Shield said.

The "angel" was from the U.S. Army Corps of Engineers.

Hunting accident

A freak accident while deer hunting on Oct. 14 wounded Shield. He and his wife and son were crossing a fence like the hunting safety courses recommend, with the rifles on safe and lying on the ground. Investigators speculate that one rifle slid on the wet ground, disengaging the safety and pulling the trigger, firing the .308-caliber, bolt-action rifle. From a range of about two feet, the bullet and muzzle-blast ripped most of Shield's left calf muscle away from the bone.

Pain and prayer

Disoriented by pain, in shock from blood loss, Shield immediately started to pray. "It wasn't a prayer for myself, but for my family. I asked for help because I was afraid I might never be able to take care of them again. I thought I was probably going to lose my leg, but I was reassured and hopeful because I knew the angel was an answer to my prayers.

"He just seemed to appear from out of nowhere," Shield continued. "He immediately reassured me I was going to be alright. I vaguely remember that he took stock of the situation and helped my wife and son. Then he helped her get me downhill more than a half mile so I could get medical attention. When we got to the bottom, suddenly, as quickly as he had shown up, he was gone. I didn't know where he went; he just disappeared."

The 'angel'

The "angel" was Phil Fishella, a water quality biologist in the Hydrology Office of Walla Walla District.

"I was hunting up in the hills along the South Fork of Coppei Creek in southeastern Washington around mid-morning," Fishella said. "I'd stopped to take a break and have a quick snack when I heard a shot. Hunters know the sound of impact, and that's what I heard. I thought to myself that someone had just gotten their deer.

"But almost immediately afterward, I saw this young boy running down the hill," Fishella continued. "I waved to him and he ran over to me. He said he needed help because his dad had just been shot. Naturally, like anyone would, I went to see if there was anything I could do. When I got there, his wife was trying to stop the bleeding and comfort and help her husband."

Lori, Shield's wife of 15 years, was giving first aid to slow the blood loss when Fishella arrived. Thirteen-year-old Andrew ran back down the hill to find someone who could call for help. He found another hunter with a cellular phone who called 911, which sent a helicopter, sheriff's deputies, and ambulances.

But none of them would find Shield, because he was on the South Fork of Coppei Creek, while emergency responders were searching near the North Fork, about six miles away.

Down the mountain

Meanwhile, Fishella helped Lori get Shield down the hill.

"I helped her get him up," Fishella recalled. "We propped him up between us. He held onto the sling of my rifle for support, then the three of us started down the hill. On the way, I wanted to keep him talking to us. He wanted some water and to lie down. I didn't think that was a good idea, so I used the promise of water as an incentive to keep him moving. We talked about anything and everything to keep him going. At some point, I told them I worked at the local Corps office, and that this was my first hunt in Washington since moving here earlier this year."

Near the bottom, two other hunters took over for Fishella and helped Lori get Shield into their four-wheel-drive. Fishella quietly left them at that point, and the other two hunters rushed Shield and his family to St. Mary's Medical Center in Walla Walla.

At the hospital, doctors in the emergency room stabilized Shield and rushed him to an operating room. Despite the massive trauma, there was little tissue loss and surgeons were able to reattach the torn leg muscles. Then they placed Shield on a ward for observation.

Shield's 38th birthday was the day after the accident. A nurse asked him, "So what do you want for your birthday?"

"All I want is to regain the use of my leg," Shield replied.

Recovery

He got his wish. Shield endured six days in the hospital and two more surgeries for skin grafts. He was discharged on crutches with a prognosis that his leg would heal well enough to walk on. The doctors were right; Shield can now walk normally. On Dec. 11, he returned to his regular job as the meat department assistant manager in a local grocery store.

Through it all, Shield remembered his prayers for his family, and the stranger on the mountain. Shield was still half-convinced the stranger had been a genuine angel.

Fishella, in the meantime, finished hunting season without taking a deer and quietly resumed his daily routine. He says first aid training he has taken through the Corps helped him respond to the emergency, but takes no credit for his assistance.

"The real credit goes to Dave and his family," Fishella said. "I'm glad I could help them, but they really came together in that situation."

Detective work

Being a modest and low-key man, Fishella told no one about the incident, and kept his anonymity for several weeks. But Shield and his family were determined to find their Good Samaritan. They recalled a few vague details from the conversation while moving down the mountain. The key was the mystery man's mention of where he worked.

They began their search by contacting Walla Walla District to see if anyone could track down the person who aided them, and some checking quickly pinpointed Fishella. When asked, he acknowledged he was the man the Shield family sought. They quietly met on Dec. 8 in his office.

"We were really glad to get a chance to thank him for helping us," Shield said. "Who knows how things might have come out if he hadn't been there when we needed someone? I got to meet my 'angel from the mountain' and shake his hand and tell him how much I appreciated everything he did for me and for us."