



Staff Sgt. Forrest Woods of B Company, 249th Engineer Battalion (Prime Power), makes internal repairs on a 200-kilowatt generator in preparation for relief operations in the Fort Drum, N.Y. area. (U.S. Army photo by Pfc. Vance Andersen)

Army engineers combat Northeastern ice storm

Sections of New York state, Vermont, and New Hampshire were hard-hit by an ice storm Jan. 7-10. The storm claimed several lives, left more than 100,000 without electricity, and forced thousands into public shelters.

The Federal Emergency Management Agency (FEMA) assigned the U.S. Corps of Engineers several missions to assist with recovery efforts.

The Corps deployed two warrant officers and 13 soldiers from its 249th Engineer Battalion (Prime Power) to provide emergency power. "Our first soldiers arrived Jan. 11, and the rest on Jan. 12," said Lt. Col. Kurt Ubellode, 249th commander. "With no delay they began assessing storm damage and installing generators."

FEMA provided generators for emergency power. The 249th's soldiers received them at the staging area at Fort Drum, N.Y., and installed them where needed. As of Jan. 12, generators had been installed in a hospital and nursing home, and at the St. Regis Mohawk Indian Reservation near the Canadian border. In addition, the 249th soldiers readied generators at FEMA's Atlanta logistical depot.

The storm's effects were widely felt along rivers. As of Jan. 12, the Corps' New York District had given the state more than 30,000 sandbags.

Downed trees and debris drifted into the upper Hudson River and threatened to clog the navigation channel. To keep the channel open and prevent debris from entering New York Harbor, the district dispatched the drift collection boats *Driftmaster* and *Gelberman*. Their crews collected 57 tons of debris from the Hudson River. They placed the material on barges destined for a recycling center or landfills.

FEMA also requested mapping support and Steve McDivitt, a geospatial information specialist from

New York District, volunteered to work in FEMA's Disaster Field Office in Albany, N.Y. He made maps that measured populations and areas that were hit by the storm. One of his first jobs was to map potential shelter locations to send to disaster victims. Later maps identified environmentally sensitive areas and cultural resources so that mitigation efforts could avoid them. The mapping effort also called for maps of Corps projects and navigable waterways and how they were affected by the storm.

The Freezing Rain Survey Team (FRST) from the Cold Regions Research and Engineering Laboratory (CRREL) sent Kathleen Jones and Nathan Mulherin to New York state and Vermont during the storm to assess damages and collect weather data and ice samples. After the storm, they also surveyed areas of New Hampshire.

After the survey, FEMA requested assistance from Jones and Mulherin. "FEMA usually deals with floods," said Jones. "Ice storms aren't something they're used to, so FEMA wants us to bring them up to speed. They want to know if this was a freak storm, or something they might deal with again."

Jones and Mulherin wrote a draft report which they delivered to FEMA early this month. The report included data which the FRST collected about ice accumulation and damages, and estimated ice loads from severe freezing rain storms that occurred in these states in the past 50 years. Past ice loads were determined using CRREL's ice load model and historic weather data from the Air Force Combat Climatology Center. The information will become part of FEMA's final report and recommendations for dealing with similar future storms.

(Bernard Tate of headquarters and Pete Shugert of New York District wrote this article.)

Seattle District partners with recreation service

A partnering session has solidified Seattle District's role as the single district responsible for executing the Army's morale, welfare, and recreation facilities program in the U.S. The district's customer is the U.S. Army Community and Family Support Center (CFSC), based in Alexandria, Va., which oversees the MWR program.

Partnering with CFSC goes beyond setting expectations and dispute resolution procedures. Rather, partnering is a way to enhance productivity and profitability, two areas of importance to this customer. More often than not, when those in government hear about behaving like a business, it conflicts with the notion of public service. However, in the MWR community, business operations mean exactly that. MWR facilities are primarily supported with soldier dollars -- non-appropriated funds (NAF). Few tax dollars are used for their operation. Instead, funds are generated through business revenues at other MWR facilities.

"If you want to see true business operations at work in the government, look to CFSC to set the example," said Kelly Morgan, Seattle District's NAF Major Construction Program Manager. "This organization is clearly focused on making money in order to deliver better facilities to our soldiers."

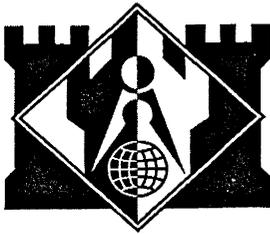
"Partnering helped us all get a better focus and understanding of what each of us needs to do to get a better product," said Jerry Thompson, CFSC's Director of Construction.

Thompson's Chief of Engineering, Bill Stickles, added, "The problem before was a lack of understanding of each of our goals and capabilities. Partnering clarified where we want to go and enlightened each other on everyone's capabilities and limitations." Stickles expressed confidence that partnering and the single-district concept will mean "things will improve significantly" in project execution.

"The whole premise of the single-district concept is to avoid going through the retraining process every time we turn a project over to the Corps," said Thompson. "We were suffering inefficiencies when we had to deal with 13 districts which infrequently worked NAF projects. With a change in districts, project managers lost the expertise of a prior MWR NAF project, if they had the opportunity to gain any expertise at all. Under the single-district concept, we can consolidate the program in sufficient quantity to institutionalize MWR NAF in the same way as the appropriated-funded military construction process."

Morgan said, "CFSC is light years ahead of the other military branches in its ability to get sound, viable business ventures up and running. CFSC is able to go from an installation's business concept through programming, design, and complete construction in as little as

Continued on page 3



Vision commentary

(Editor's note: This is one in a series of commentaries relating to cultural aspects of the Corps Vision. Each is the opinion of the writer. Please write a letter to the editor if you feel strongly about a commentary's message.)

PM: More than a name change

The greatest challenge the Corps faces is fully implementing the project management process.

The Corps has traditionally been a highly functional organization whose primary paradigm and cultural model is the "stovepipe." When project management was implemented about a decade ago in response to increased competition, diminished resources, and customer demands for "better, faster, cheaper," we responded as you would expect a traditional, highly functional organization with a proud history of successfully meeting challenges to respond. We bitterly fought the imposition of a very different way of doing business and the necessary changes in culture and behavior. We eventually adapted by creating yet another stovepipe for Project Management to match our existing paradigm and culture. With this change we added layers of redundant managers, resulting in added expense, unclear roles, lack of accountability, employee frustration, and customer dissatisfaction.

We are currently in the midst of rewriting the Engineering Regulation (ER) on the project management process. Key to the successful implementation of this ER will be the change in the Corps paradigm, and consequent culture and behaviors, to view project management as a process rather than a "stovepipe."

The new ER on project management cannot be all things to all people. We must decide, once and for all, whether we are going to be a functional organization or a PM organization (i.e., an organization that uses the process of project management as its primary business process).

Fundamentally, I see the problem we are addressing with the PM ER as that of moving the Corps from a stovepipe/functional organization to

an integrative organization, using the process of project management, among other processes, to get there. As a stovepipe organization, the Corps culture is to compartmentalize actions and problems — and keep each piece isolated. We see problems narrowly, independent of their context and connection to other problems.

Our functional culture is to assume that problems can be solved by carving them into pieces and having the pieces assigned to isolated specialists or stovepipes. As soon as a problem is identified, we carve it up and compartmentalize it into various functions. Each component has only a part of any problem and no assumed need to worry about any other part. "Success" means that each function works independently, with minimum need for communication; it implies "failure" if some other function has to start worrying about my piece of the problem. For example, I've seen

mechanical engineers recognize a serious electrical deficiency and not tell anyone because the eventual identification and solution by the electrical designers would delay the project and give the mechanical designers additional time to complete "their" piece. Unfortunately, this is not uncommon in a strong functional culture.

The problem with the stovepipe approach is that, most often, the "pieces" that we create don't fit when they all come together — at least not without a great deal of rework and cost. Expensive and time-consuming, the functional approach also discourages people from seeing whole problems. They see only local manifestations of problems. Likewise, when people's activities are confined to the letter of their jobs and they are required to stay within their functional walls, it is much less likely they will think beyond what they are given to do. Functional specialists' biases are also more likely to inhibit innovation in the Corps because our technical experts have little incentive (and in some districts, great disincentives) to consult with other, different specialists. It is not unusual for functional chiefs to consider it "disloyal" when a member of their organization works with, or even speaks to, members of other functions.

However, on several effective Corps multi-disciplinary teams that I've worked on, breakthrough ideas (that were often elegant in their simplicity) came from people outside the specific technical area involved. Because members of the team were operating on the edge of their competence and not restrained by thinking of what had worked in the past, the entire team was able to redefine the problem so novel solutions emerged.

The institutionalization of team processes must be part of the larger movement to an effective PM process. Focus on teams requires trust and commitment. Without trust there is very limited team action. Communication is censored and bureaucratic turf battles ensue. Commitment, not authority, produces long-term results. It allows for a synergistic effect to happen as we move from independent individuals and organizations to interdependency where the actions of the whole are greater than the added efforts of each member.

I know there is much heartache over the Chief's decision to take PM out of CP-18. I believe, however, we're focusing on the wrong issue. The real problem is that our stovepipe culture has kept people so confined within their functional boxes that they often don't have the integrative experience one gains from working on effective multi-disciplinary teams or working across functional stovepipes. Moreover, the stovepipe nature of most Corps employees' career paths makes it hard to find many people with integrative experiences bridging their stovepipe specialties. Like the Chief, I've also seen very effective PMs who were not engineers. While there are certainly times when specialized technical expertise may be important for a PM, I think what the Chief has seen in effective non-technical PMs are individuals with integrative backgrounds bringing together several dimensions of their organizational experience. They are comfortable building relation-

ships and making connections that crisscross the organization chart and are able to see problems as wholes.

The solution is not to argue that all PMs must come from certain functional backgrounds. The solution is to find, train, develop and support PMs with these integrative talents, regardless of their background. It is also to find ways, using the PM and team processes, to give all our employees, especially technical experts, more opportunities to develop integrative skills by participating on multi-disciplinary teams where they have the chance to be part of an entire project, not just a piece. In this way we build a greater pool of PMs and enhance the quality of our technical experts.

Key to the effective implementation of the PM process are changes in the personnel management system (job descriptions, performance standards, awards, etc.) which make people less stovepipe-conscious. In a functional organization, the worker's question is, "What is my job?" In a PM organization, the question must be, "What needs to be done?" It sounds simple, but this change in thinking involves a monumental cultural change for the Corps.

Also, in a PM organization, our PMs will have significantly different responsibilities than many do today; we must ensure that we have the right people in these critical positions. In many cases throughout the Corps, we have PMs who are great at upward reporting but poor leaders. In order to get the right people in these key jobs, we may have to look at re-competing PM positions. Regarding the question of "control" that PMs have, I believe that Corps leaders, even District/MSO commanders, must recognize that they cannot "control" every aspect of the work these teams are doing. When that starts to happen, the focus is up the hierarchy to the bosses and away from the customers. For the PM process to be effective, PMs and their teams must focus their energy on doing whatever it takes (within legal and ethical limits) to please the customer. It is going to be a very tough job indeed to convince traditional Corps bosses at all levels that they are going to be held responsible for aspects of work that they no longer "control."

We cannot change the PM ER in isolation. If we are going to truly revolutionize the effectiveness of the Corps through the effective implementation of the PM process, we are going to have to take the same holistic approach we advocate in the ER. We must look at the Organization and Functions ER because PM cannot be effective unless it is understood that the job of technical chiefs is fundamentally different in a PM organization (responsible for recruiting and developing the technical experts for teams led by PMs, for implementing quality control processes, and for playing a greater role in the corporate leadership of their organization). We also must change any Human Resources rules that inhibit the effective use of multi-disciplinary teams, and develop HR systems which reinforce the PM process (360-degree feedback, matrix rating schemes, team awards, re-competing of PM positions, etc.).

This is probably the most important (and difficult) issue facing the Corps today; the Chief has given us an opportunity and it is imperative we get it right!

Stephen E. Browning
HQUSACE

We must decide, once and for all, whether we are going to be a functional organization or a PM organization.



Memphis finds innovative alternative

Former K-mart store becomes temporary finance center home

By Brenda Beasley
Memphis District

The U.S. Army Corps of Engineers' Finance Center in Millington, Tenn., is enjoying new temporary quarters, thanks to Memphis District's contributions to the building alteration project. Workers completed the project on Nov. 7, five weeks ahead of schedule, according to Dave Ferguson, the project quality assurance representative. Ferguson is a senior architect in the Structural, Electrical, and Mechanical Section.

The USACE Finance Center was previously housed in an empty classroom building that was vacant after the Navy's training mission moved from Millington to Pensacola, Fla. The structure required considerable retrofitting to handle the Finance Center mission.

Navy contractors determined that the retrofitting work couldn't be done with the Finance Center in place, according to Richard J. Williams, chief of Information Management and Facilities at the Finance Center. That's when the search began for a new temporary home.

The district's Real Estate Division led the search, quickly found a suitable temporary location, and negotiated a lease for the former K-Mart in Millington.

This innovative alternative was a departure from the traditional use of office space, according to Bob Baker, realty specialist. They approached Millington's Industrial Board to obtain the empty retail department store building for conversion.

"This acquisition and conversion process sets a new example for housing a government agency in a place of business," Baker added. The facility also offers greater security and saves taxpayers more than \$1.6 million during the next three years.

In another innovation, the design engineer was the full-time, on-site Quality Assurance Representative (QAR). During the fast-paced construction effort, the customer and the Millington fire marshal wanted several changes made, according to Don Tutor, area engineer at the Wynne Area Office (WAO). Under traditional procedures, the customer would have sent the requested changes to the WAO. From there, the customer would have gone through Construction Branch to Engineering Division. Engineering would have sent the modified contract work back through Construction Branch to the WAO. The WAO in turn would send a "request for proposal" to the contractor, get the contractor's proposal, negotiate the changes, and finally issue a modification to the contractor.

Tutor believes that having the design engineer on-site as the QAR reduced the process and helped complete the project in only 85 days. "We probably would have needed 240 days to complete this alteration contract if the design engineer hadn't been available full-time," said Tutor. "In addition to finishing five weeks ahead of schedule, we were also able to incorporate customer changes with no delays in the construction time and only a five percent cost overrun."

As the on-site QAR during the first phase of the project, Dave Ferguson also designed phase two of the project. He coordinated the phase two design architectural, structural, mechanical, electrical, specification, and bidding documents with the Finance Center.

During phase two, Ferguson continued as the on-site QAR. In that position, he helped with decision-making during construction and aided the contractor in obtaining approvals for his work.

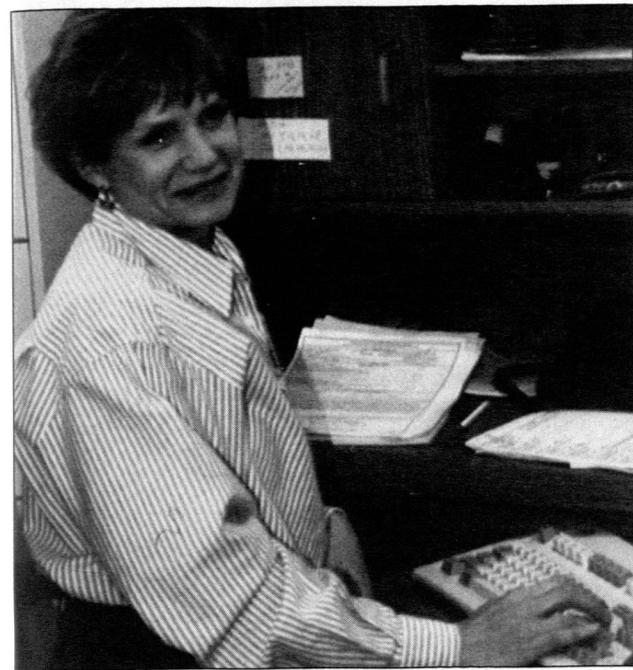
Because the building had been vacant three years, there were problems with the water heaters and roof. "We also had to extricate a vagrant who had taken up residence in the bathroom," said Ferguson.

Most of the contracted work was electrical. There were 340 workstations installed and each required a telephone, a desk light, and a computer system. The workstations arrived disassembled, so the contractor put them together on site.

"I was able to consult with the customer on color selections and designs immediately," Ferguson said. This allowed the contractor to order the necessary materials the same day the review and approval process was completed. Ferguson also advised the Finance Center in other areas, including security, mechanical, electrical, and plumbing needs.

"Memphis District gave us a quality product" said Finance Center representative Williams. "It also provided a comfortable environment for our employees."

The Navy is scheduled to begin a 10-month contract to retrofit the base location in September 1998, according to Williams. The Finance Center is scheduled to be back at that location around mid-1999.



Rheba McDaniel tries out one of the 340 workstations at the new Finance Center. (Photo courtesy of Memphis District.)

Seattle sole agent for morale facilities

Continued from page 1

28 months. The motivation is clear -- the earlier CFSC can open the facility, the earlier it can begin to make a profit, which in turn allows it to build and upgrade more facilities."

CFSC would like to extend its program to the other branches of the military and become the single MWR NAF construction facilitation agent for the Department of Defense (DoD). "We would very much like to pursue that," Thompson said. "It would save money for everybody by turning out projects much quicker than we ever have in the past. We can envision passing those same advantages onto the other branches. We have done projects for the Navy, and those are success stories. DoD is moving toward consolidation in a lot of areas. We would look to the Corps to be our primary executor. The Corps is doing 75 percent of our work now, and we could be sure of achieving the same amount in the future."

Stickles says that two memoranda of understanding have been signed with the Marine Corps and the Navy to support MWR NAF construction. The Navy has been "quite pleased with projects we have taken over. We're looking forward to expanding that in the future. We are satisfied with the results so far. Our main objective has been to improve the construction

process within the federal government, and in turn offer those organizational strengths to our customers if they wish to take advantage of them."

"I try to execute the MWR NAF program with two primary goals in mind," said Morgan. "If we can help our customers succeed in their own growth goals, Seattle District will in turn benefit directly from increased work. Second, and perhaps more important, since this program involves working across district boundaries, it presents a perfect opportunity to get closer to the One Corps concept. Despite being managed by Seattle District, this program requires the support and expertise of multiple districts if it is to be successful. I hope to combine CFSC's impressive execution methods with the vast technical abilities of the Corps."

The partnering session went a long way to ensure the success of Seattle as the single district for MWR NAF construction, and toward fostering the growth of CFSC. "When you're talking about working with CFSC, you've got to understand that it operates like a business and not a bureaucracy," said Morgan. "This is one case where concerted partnering efforts will directly affect everyone's bottom line."

(This article was written by the Seattle District Public Affairs Office staff.)



This guest lodge entrance ushers soldiers and their families into \$3.5 million family temporary quarters at Fort Lewis, Wash. Seattle District is the single district responsible for execution of the Army's morale, welfare, and recreation facilities program in the continental United States. (Photo courtesy of Seattle District.)

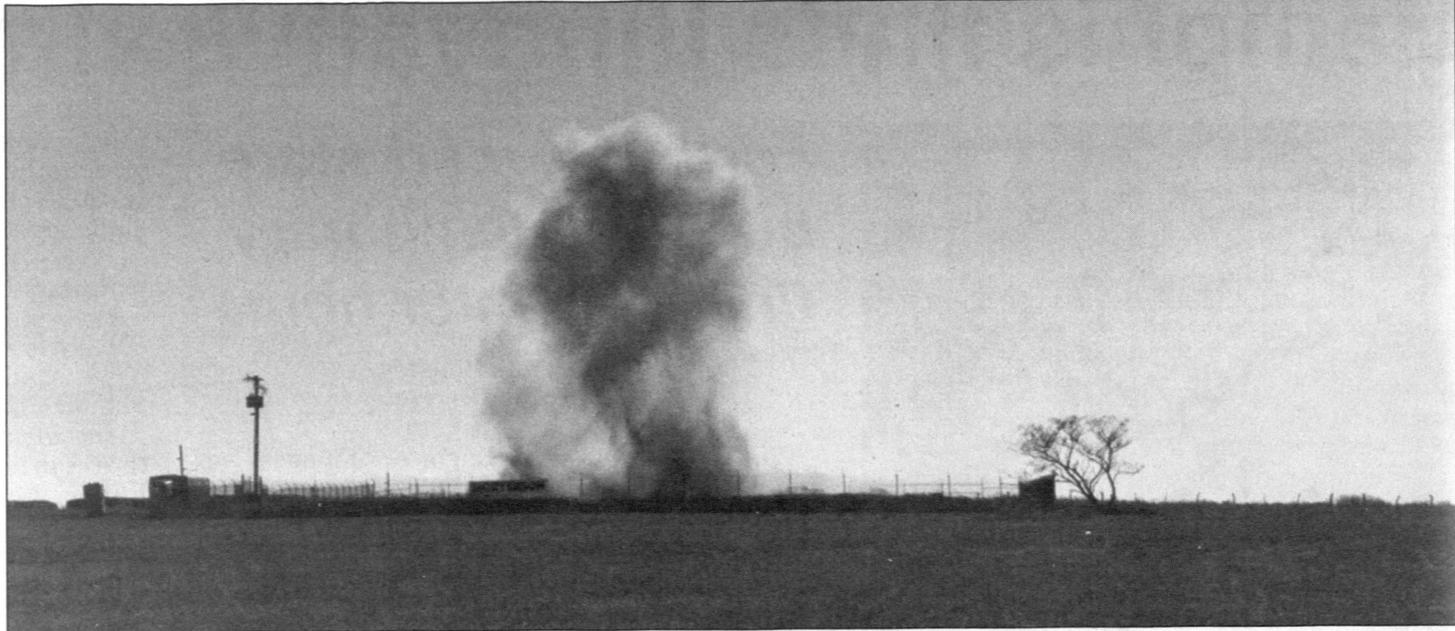
Districts destroy last silo

By Larry N. Crump
Kansas City District

The final curtain of the Cold War fell a bit further Dec. 15 as Omaha and Kansas City districts helped destroy the last Minuteman missile silo in Missouri.

The event had an atmosphere of celebration. Youngsters were bussed in from a nearby school. Television crews and other media were present everywhere. Martial music blared from giant speakers, and the crowd of some 300 people was animated and talkative. The seven key military and civilian officials arrived by helicopter, adding to the spectacle.

The star of the show, a decommissioned Minuteman II missile silo, was just a few hundred feet from the crowd. Called "Hotel 11" by its Air Force operators, the silo was the last to be destroyed of 150 such Minuteman silos in Missouri. Removal of the warheads and destruction of the silos, whose history dates to the 1960s, was part of



With a muffled thump, the last of 150 Minuteman II missile silos in Missouri implodes. (Photo courtesy of Kansas City District.)

the Strategic Arms Reduction Treaty (START II) between the U.S. and the former Soviet Union. The first silo in Missouri was destroyed in December 1993. Destroying the final silo, long empty of its warhead, completed the four-year project.

Hotel 11 was in a field near Dederick, Mo., a few miles northwest of El Dorado Springs, Mo. The end came with a classic countdown from 10, and the crowd joined in the count. Air Force Brig. Gen. Tom Goslin Jr., Whiteman Air Force Base's 509th Bomb Wing Commander, plus a rep-

resentative of M.A. Mortenson Construction and five other officials, simultaneously turned keys to set off explosive charges planted by the Mortenson crew. With a loud, but muffled *thump*, the ground over and around Hotel 11 rose a few feet then fell, and a plume of smoke and dirt shot up from the site.

Kansas City District (KCD) was involved in land acquisition and site development for the Minuteman II in the 1960s.

This contract to destroy the facilities was designed by Omaha District,

with KCD serving as contract administrator, and M.A. Mortenson Construction as the prime contractor.

Under terms of START II, the Russians and other former Soviet Bloc countries are monitoring the U.S. program of destroying intercontinental ballistic missiles, just as the U.S. monitors their program. Once Hotel 11's destruction is verified, the hole that now makes up the Dederick site will be capped and filled with dirt, as were all those destroyed earlier. The land will be offered to the original owner, or sold by bid process.

Corps team tracks down radioactive waste

By Denise Tann
Baltimore District

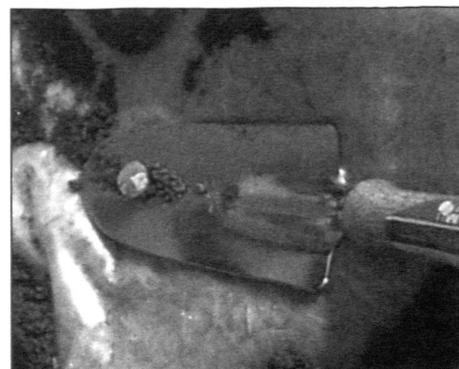
A growing team of health physicists in the U.S. Army Corps of Engineers is putting the "R" back in "HTRW" (hazardous/toxic/radioactive waste) by integrating radioactive material investigations into the scope of work of traditional hazardous and toxic waste projects.

The renewed emphasis on these investigations adds a new dimension to the services available in Baltimore District's Hazardous Toxic and Radioactive Waste Branch, according to Peter Garger, chief of the branch's Industrial Hygiene and Chemistry Section.

The district works in partnership with the Hazardous Toxic and Radioactive Waste Center of Expertise in Omaha, Neb. Health physicists from Tulsa, Omaha, and now Baltimore districts support the center's missions dealing with radiological issues. These health physicists act as technical consultants on missions managed throughout the Corps or as part of an investigative team for HTRW projects.

In Baltimore, those projects include formerly used defense sites, base realignment and closure (BRAC) initiatives, the defense environmental restoration program, the installation remediation program, or the formerly used sites for remedial action program recently transferred from the Department of Energy.

Radioactive materials became popu-



Above, Hans Honerlah (left) and David Hays zero in on the object's location. At left, the radioactive marker found and removed from the grounds of a Marion, Ohio, high school. (Photos courtesy of Baltimore District.)

ciently large doses, radiation can be deadly. Hans Honerlah, a new district health physicist, said health physicists are constantly aware of the risks involved. Determining the levels of protection is critical when conducting radioactive material investigations.

Just recently, Honerlah responded to a call for assistance from a Marion, Ohio, high school. He joined a team of Corps workers and people from the Ohio Department of Health and Ohio Envi-

ronmental Protection Agency to remove a dime-sized marker with four prongs from the grounds of River Valley High School. The object, found six inches below the surface, had been covered with radium paint used to make objects glow in the dark during World War II.

Honerlah and David Hays, a Tulsa District employee, scanned the ground to determine radiation levels before removing the object. During the two-and-a-half hour dig, the team, headed by Wes Watson, Louisville District project manager, monitored the ground for traces of radiation. If the levels had been dangerous, according to Honerlah, the project would have been stopped immediately. Fortunately, radiation levels remained low throughout the process. After removal, a Wright-Patterson Air Force Base officer transported the object to the base for disposal.

Collaborating on projects such as this offers customers a one-door-to-the-Corps service for radioactive material investigations. Missions may come through the HTRW Center of Expertise or from specific requests from agencies seeking technical support.

Currently, the district is partnering with the Center for Health Promotion and Preventive Medicine at Aberdeen Proving Ground, Md., on initial investigations and radiation surveys at the Walter Reed Army Institute of Research. Another effort under way is the environmental investigations being done at Camp Pedricktown, N.J., under a BRAC initiative.

lar in the scientific, military, and medical communities in the early 19th century. Since the beginning of time, background radiation from the decay of uranium, thorium, and other elements has been present, but in suffi-

Explosion: electricians find fast fix

By Jennifer Wilson
Little Rock District



Nearn and Fatherly hold pieces of the exploded pothead insulator. (Photo courtesy of Little Rock District.)

was compounded by the fact that one of Dardanelle's generators was already down to be rehabilitated, leaving only one unit operational.

A replacement pothead was on hand, but the team discovered it was not the right type, and it could not be easily adapted for immediate use. Ordering another would delay repairs by at least three days. "The metal casing on the blown pothead was still intact, so we decided our best option was to try to rebuild it," Newland said.

They found a new ceramic insulator that would fit the metal casing, and cleaned the casing itself. "We had to

heat the casing to get the old potting (or insulating) compound out and clean the metal of all impurities, because the impurities could conduct electricity," Fatherly said.

They put the new ceramic insulator in the cleaned casing, and put the whole assembly back on the frame eight feet off the ground.

But the job wasn't done. The assembly still had to be filled with new potting compound, which is no easy job. Normally, the assembly is filled under carefully-controlled factory conditions, because the compound has to be heated to between 325 and 350 degrees Fahr-

enheit.

The team was working in a much-less-controlled environment. They heated the compound with an acetylene torch and monitored the temperature with a candy thermometer while perched atop ladders, hidden behind tarps to break the wind at a work-site on one of the coldest days of the month.

The conditions were tough, but their *real* problem came in getting the compound into the pothead. It has to be filled from the bottom up to displace any air which might be trapped inside the assembly. So the team devised a gravity feed tube and funnel. They screwed the tube into the lower opening of the pothead casing, held the funnel end of the tube above the casing, and poured in the melted potting compound. Gravity did the rest and the compound flowed into the casing from the bottom up.

With a little luck and creative engineering, the repairs worked. At 8:30 p.m., 15 hours after they started, the team turned the transformer back on and brought generators 3 and 4 back on-line.

"You have to realize that these guys were not working under the best circumstances," said Ken Storm, powerhouse superintendent. "They were doing work they had never done before, and they were working against the clock in extremely cold weather to get this job done."

Korean camps get master planning

By Gloria Stanley
Far East District

Far East District (FED) is gaining valuable experience in master planning and moving toward having this critical expertise that customers of the U.S. Army Corps of Engineers are asking for with increasing frequency.

In September 1996, the 19th Theater Army Area Command (TAACOM) requested FED support in executing comprehensive master plans for Camp Humphreys and Camp Carroll in South Korea. Discussions with the 19th TAACOM revealed the two installations were the first of a number of master planning actions that would begin in Korea during the next five years. FED's customer (19th TAACOM) wanted full comprehensive plans using the latest Computer Aided Design Drafting (CADD) and Geographic Information System (GIS) technologies. But they were not confident that the scope of work they had written accurately defined their needs or was affordable.

FED contacted the U.S. Army Center for Public Works and learned about the U.S. Army Corps of Engineers Master Planning Team (USACE MP Team) which had accomplished more than \$20 million in master planning for U.S. Forces Command installations in the past five years.

FED asked the team to provide a proposal for how the district should

approach the Korean initiative, then make a presentation to the 19th TAACOM. There were also presentations by each invited architect-engineering firm and a description of the strategy proposed by the Corps' Pacific Ocean Division. From the alternatives presented by FED, the 19th TAACOM selected the USACE MP Team.

On February 10, 1997, the Corps and the 19th TAACOM signed a Memorandum of Agreement for executing this master planning effort, and the work has been proceeding ever since. The USACE MP Team incorporated FED team members as they executed the master planning efforts for Camp Humphreys and Camp Carroll. Being a part of this team has given FED hands-on experience and knowledge in master planning, while also giving the customer an excellent product.

The plans provide comprehensive updates of the installation master plans for the next five years, incorporating Apache helicopter and Patriot missile system fielding and aviation restructuring initiatives at Camp Humphreys. Plans at Camp Carroll include activation of the 23rd Chemical Battalion. The plans also support mission changes and expansion; address quality of life issues; and are environmentally sensitive, energy efficient and cost-effective. They provide the optimum functional layout and consider additional requirements for possible base expansion.

The updates include the Spatial Data System which converts existing Basic Information Maps to the more accurate electronic format GIS-quality maps for spatial analysis, modeling, and CADD. The team also included vendor and Corps-sponsored training for installations, FED, and the 19th TAACOM.

A requirements analysis determined the projects necessary to correct facility shortfalls through use of an automated Tabulation of Existing and Required Facilities program to automate facility impact assessments.

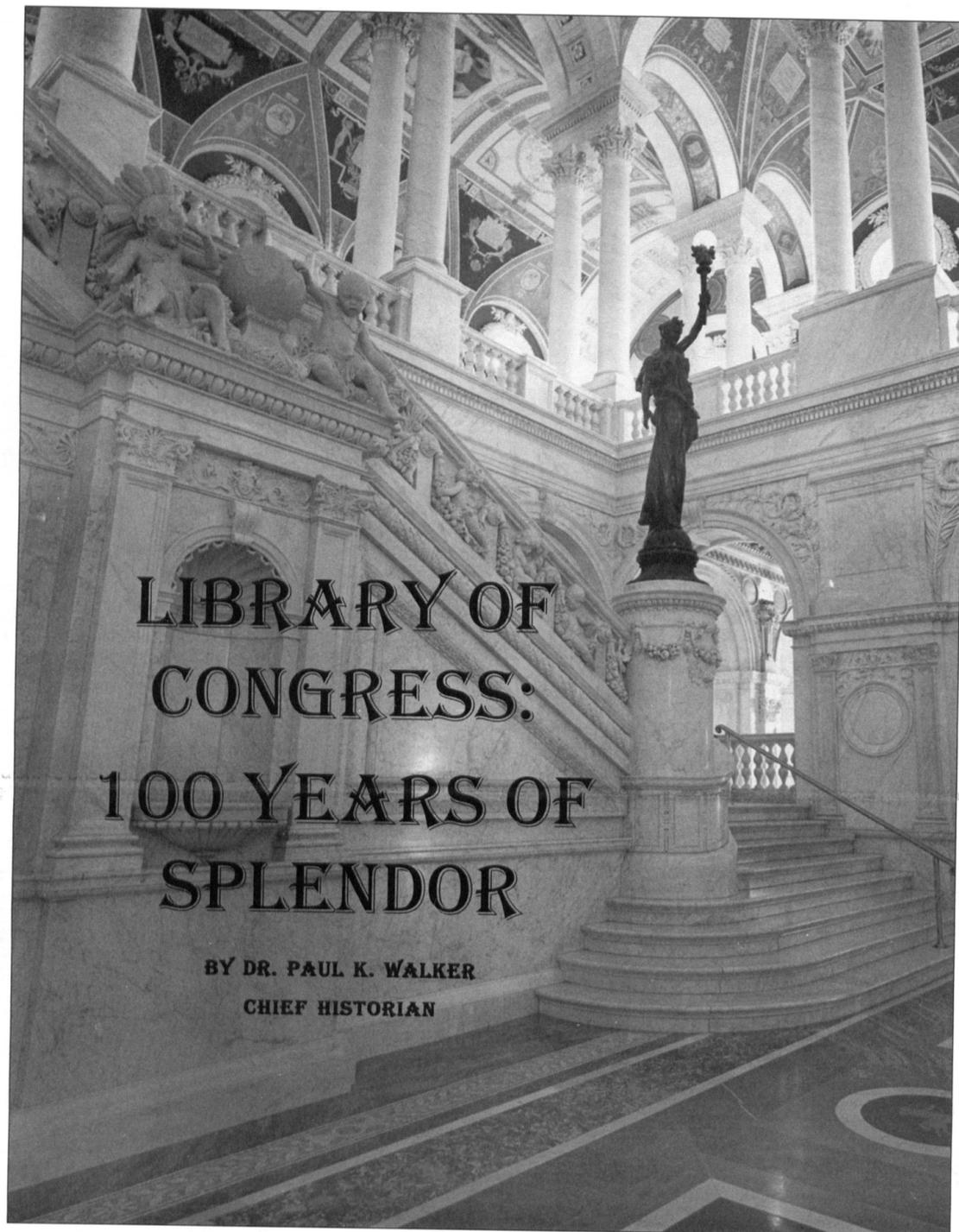
The team updated the Utility Model data base and linked it to maps in the GIS to correct deficiencies based on future demands of water, waste water, electricity, and infrastructure.

New Real Property master plan includes a long range component/general land use plan, siting analysis, and capital investment strategy. The update includes products that enhance marketing the master plan, including installation design guides and landscape plans, executive summaries, video tours, and physical models.

The team studied ways to correct airfield deficiencies at Camp Humphreys and propose consolidation of flight line activities and layout of the airfield. They also did a storm drainage study to find solutions to flooding problems. A fire station study evaluated the feasibility of a joint-use fire/crash and rescue facility.

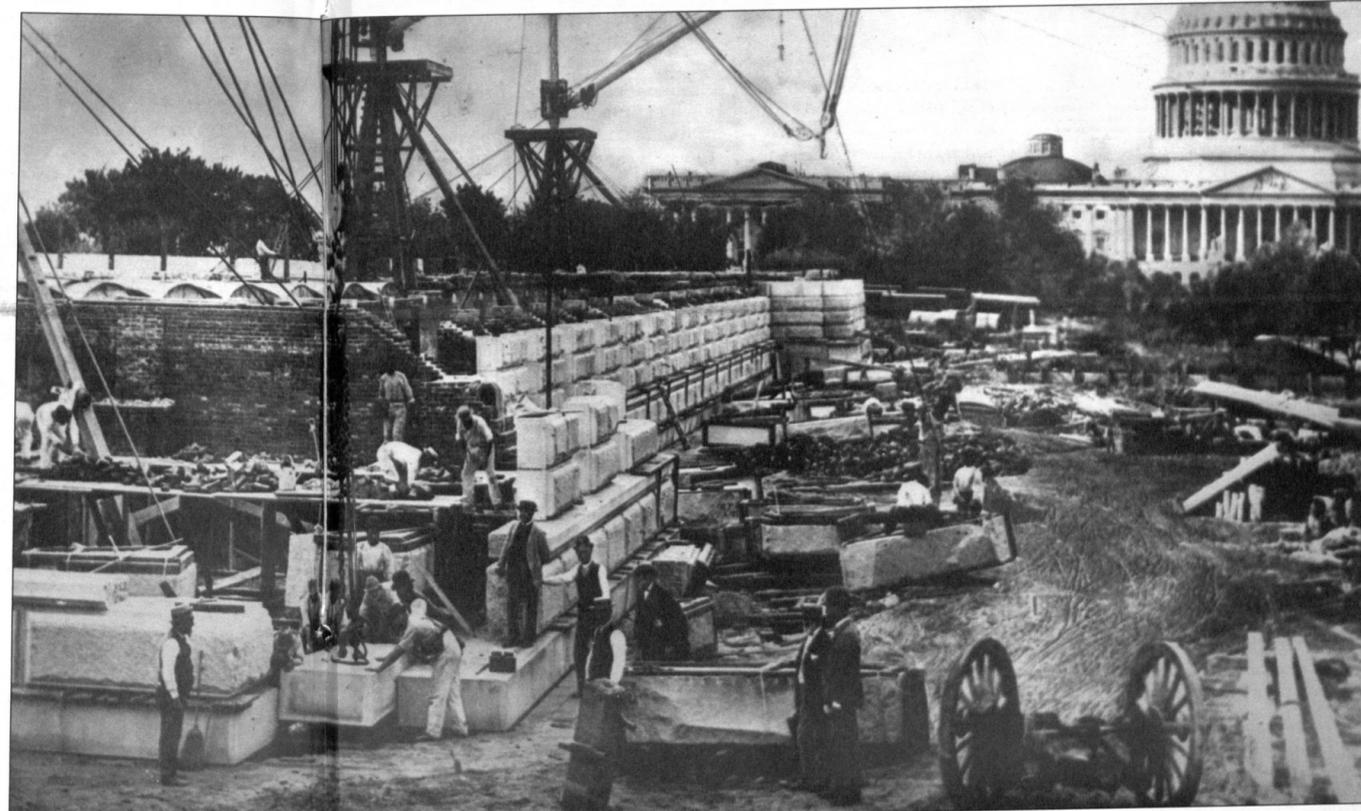
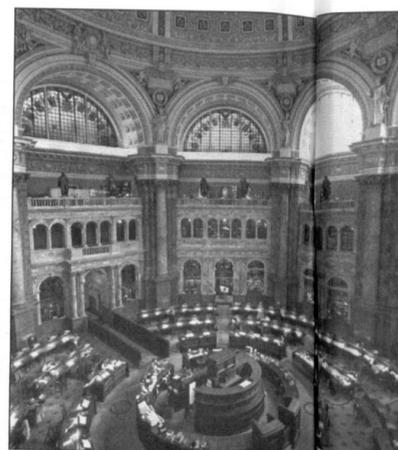


FED is helping develop master plans for Camps Carroll (above) and Humphreys in South Korea. The work is providing valuable experience for district members. (Photo courtesy of Far East District.)



LIBRARY OF CONGRESS: 100 YEARS OF SPLENDOR

BY DR. PAUL K. WALKER
CHIEF HISTORIAN



Clockwise from far left, (1) A view of some of the 15 varieties of marble in the Library of Congress. The floor is of French and Italian marble in red, white, and yellow. (2) A view of the dome's interior. (3) Construction in progress, November, 1892, with the outer walls of the third story and the base of the dome underway. (4) Artisans fashioned decorations in makeshift studios set up in unfinished portions of the building. (5) Laying the cornerstone, Aug. 28, 1890. (Photos 1 and 2 by F.T. Eyre, HQUSACE; historical photos courtesy Office of History.)



Editor's note: One hundred years ago last November, the Library of Congress Building, known since 1980 as the Jefferson Building, opened to the public. Its construction is a proud moment in the history of the U.S. Army Corps of Engineers. Recent renovations have restored the Jefferson Building to its original splendor.)

In October 1888, Congress placed the new Chief of Engineers, Brig. Gen. Thomas L. Casey, in charge of its priority construction project -- the Library of Congress. Casey teamed up again with civilian engineer Bernard R. Green, who was already on the job as superintendent of construction. As partners during the previous decade, Casey and Green had established a reputation for success with faltering projects. They realized substantial savings in finishing the State, War, and Navy (now Old Executive Office) Building, and overcame engineering difficulties to complete the Washington Monument. When completed in 1884, the monument was lauded as "one of the engineering marvels of

this century."

The library project was in difficulty due to poor management and cost and schedule uncertainties. So Congress again called on Casey and Green to come to the rescue.

When Casey took over the Library of Congress project, excavation was complete and the foundation half-finished. His first order of business was to draw up a new plan. In two months, he submitted two plans. In March 1889, Congress approved \$6.5 million for his more elaborate proposal.

Construction proceeded during the next eight years, often around-the-clock. Green ran the day-to-day operation and detailed the entire process in a journal and accompanying scrapbook. Despite his numerous other duties as Chief of Engineers, Casey spent long hours on site to consult with artists, resolve

contracting problems, meet with members of Congress and other officials, and give committee testimony.



Bernard R. Green
(1843-1914)

The undertaking was monumental. At 470 by 340 feet, the building occupied about one-third of the nearly 11-acre site. Hundreds of workers bustled throughout the area. Ainsworth Rand Spofford, Librarian of Congress, was not directly involved, but Casey and Green frequently consulted with him.

Spofford dreamed of a library for the people incorporating the latest in library technology, and the engineers did not disappoint. Green designed state-of-the-art bookshelves, the Main Reading Room was placed close to the stacks and surrounded by reference alcoves, and workers installed a "railroad" system to carry books from the library through a tunnel to the Capitol.

As construction progressed, Casey saved enough of the original appropriation to enhance the interior beyond anything imagined earlier. Thus the two engineers "seized the opportunity and turned an already remarkable building into a cultural monument." In 1892 Casey brought his 28-year-old son, Edward P. Casey, on board as architect to oversee the bulk of the interior decoration. What followed was truly extraordinary.



Brig. Gen.
Thomas L. Casey
(1831-1896)

Casey and Green employed scores of American artists and artisans to decorate the building with murals, sculpture, and decorative painting. They approved all of the themes and images incorporated in the art and the quotations found throughout the building. Major themes included learning and knowledge, transmission of knowledge, family, and government. Some said the building con-

tained more marble than any other in America. Indeed, there are some 15 varieties of marble in numerous colors in floors, stairs, railings, and pillars. Three sets of bronze doors grace the main (west) entrance. Casey and Green gilded the dome with 23-karat gold plating and added an elaborate Neptune fountain at the First Street entrance.

After Casey retired from the Army in May 1895, Congress kept him on at the Library. With more free time, he worked harder than ever. Tragically, Casey died the following March after suffering a heart attack on the job. In recognition of what had been a true team effort, Congress entrusted Green with full responsibility to complete the project.

The public, who first crowded into the new building in November 1897, was awestruck. They understood why Librarian Spofford would call

it "the book palace of the American people." Architectural critics and members of Congress joined in the praise. Joseph G. Cannon, Speaker of the House, thought it the finest public building in Washington D.C. "It is our building, and worth the money," he said. One enthusiastic visitor declared, "Not before I stand before the judgment seat of God do I ever expect to see this building transcended."

The key roles played by Casey and Green were not forgotten. They produced a monumental structure on schedule and under budget. Their construction management genius generated the savings which made the building's artistic grandeur possible. In the final accounting, \$200 thousand of the original \$6.5 million appropriation remained.

[The sources for this article were John Y. Cole, *Book Palace of the American People: A Brief History of the Thomas Jefferson Building*, (1997) and Helen-Anne Hilker, *Ten First Street, Southeast: Congress Builds a Library, 1886-1897* (1980).]

Division man builds his own airplane

By Clare Perry
North Pacific Division

Airplanes aren't cheap, but there's more than one way to get into one. Brian Moentenich did it by building his own.

"I've wanted to fly since I was a boy," he said. "A year after earning my pilot's license, I decided it was time to start building my own plane." The challenge of building an aluminum two-seater plane from a kit was all that it took for Moentenich, a mechanical engineer in North Pacific Division's Hydroelectric Design Center (HDC), to get started. In the fall of 1993, he converted his garage into a hangar of sorts.

"Since the 1980s, factory aircraft manufacturing has decreased more than tenfold because of product liability," he said. "The homebuilt airplane has emerged as one of the few alternatives to purchasing a used light aircraft." He's quick to add that the desire to build one's own plane is as much a motivator as scarcity or cost.

Moentenich, who has a private pilot's license and nearly 200 hours of flying time, selected a kit sold by a local aircraft company. The RV-6A is the most popular homebuilt aircraft in the world, a fast cross-country plane with a cruising speed of 180 miles per hour and enhanced aerobatic and performance capabilities. Powered by a four-cylinder 150-horsepower aircraft engine, the plane's empty weight is 1,025 pounds with a maximum gross weight of 1,700 pounds.

"The instructions said the plane can be built in 2,000 hours," said Moentenich. "They lie." His logbook testifies to more than 2,500 hours of sweat equity. Building a light aircraft is not just a matter of assembling parts. Hundreds of parts must be laid out to size, dimpled, drilled, riveted, painted, rigged, and sealed. "I spent two hours just to attach a rib to the fuel tank," said Moentenich. "The construction manual and drawings leave a lot to be desired. They may tell you what needs

to be done, but not how to do it nor in which order. That's the fun part."

It took five months to build the tail section, 15 months to build the wings, 12 months to build the fuselage, and 16 months for finishing and final assembly. "I learned as I went along," he said. "All parts are either bolted or riveted together. I had never riveted anything together before this." Occasionally he called colleague and fellow mechanical engineer at HDC, George Kona, who is also a professionally-certified aircraft mechanic, to help with inspections.

Most home assemblers belong to some sort of builders group who help each other build and fly their aircraft. "The Portland area has lots of support available," Moentenich said. "Any problem a builder is likely to face has already been faced and solved by others who are ready and willing to help."

Now that it's finished, Moentenich has absolute confidence in his handiwork. He says that homebuilt aircraft have a safety record equal to commercially-produced aircraft. "It's worth it. There's nothing on the commercial market with this kind of performance or designed to withstand six Gs (six times the force of gravity), rather than the typical four of a factory-built aircraft."

The materials, too, are top quality. The high-strength aluminum in the fuselage is the same as a Boeing 727's and has a yield strength of 45,000

pounds per square inch, more than 25 percent greater than the 36,000 psi rating for structural steel commonly used in buildings.

Moentenich reckoned that by the time he drove the last rivet into place, he had saved tens of thousands of dollars over a ready-made model. Still, it's an expensive hobby. The airframe kit cost about \$11,000, a used engine about \$8,000, plus \$10,000 in instrumentation and miscellaneous costs. And that's not counting paint or the \$1,500 for special hand tools like a compressor, small drill press, rivet guns, and special drills. The used engine came from an airplane damaged in a windstorm. He had to replace the oil pump, carburetor, and magnetos to meet Federal Aviation Administration (FAA) requirements. "But it cruises 80 percent faster and climbs twice as fast as a Cessna 150," Moentenich said.

He says the outlay is actually relatively modest. "If you want to talk spendy, there's a supersonic jet available for the home assembler with top speeds of 925 mph that lists for \$220,000!"

Last Memorial Day, Moentenich surrendered his garage and moved his plane to a local hangar in Troutdale, Ore., just six miles from his home. The FAA inspection and certification took place in September, which he and his homemade plane passed. To keep his airplane airworthy, it must be inspected annually. To keep his pilot's certifica-

tion, Moentenich must submit to a medical exam and a ground and flight review every two years.

Of course, flying has its dangers. The airport where his plane is tethered is well-known to private aviators for wind gusts, crosswinds, winter rains, and ice. That doesn't concern Moentenich much. He admits the ride gets bumpy at times but not enough to discourage him from flying every weekend and many weeknights.

"Homebuilt aircraft enjoy similar safety records to commercial airplanes and generally exhibit top-of-the-line craftsmanship," he said. "Accidents tend to occur because of fuel mismanagement, poor airmanship skills, and flying in dangerous weather conditions." Even singer John Denver's recent fatal crash in a homebuilt plane hasn't swayed him. "Denver was an experienced pilot. They still don't know what happened in that situation, but anyone can make a mistake, so you always have to stay alert, fly safely, and be careful."

Moentenich's plane carries a 38-gallon fuel tank for four continuous hours of flight. Its maximum cruising altitude is 12,000 feet, or 25,000 feet if he wears an oxygen mask. Most of his local trips are at 3,000 feet, although his recent reconnaissance of Mt. St. Helen's crater, which took him to 9,000 feet, is more typical of altitudes for cross-country hops.

Though he has yet to convince his wife or daughters to climb aboard, Moentenich is planning some long-distance jaunts in 1998. "I'd like to get to summer fly-ins in Wisconsin and in Florida and to a volleyball tournament in California," he said.

With his aircraft nearly finished, Moentenich is reluctant to talk about the new restlessness he's feeling, especially since he has yet to tackle the tedious job of painting the plane. However, "I've got my eye on another design that features a foam and fiberglass composite and is more aerodynamically efficient," he said. "Building your own plane is almost as much fun as flying it. It's like a hobby. You're never done."



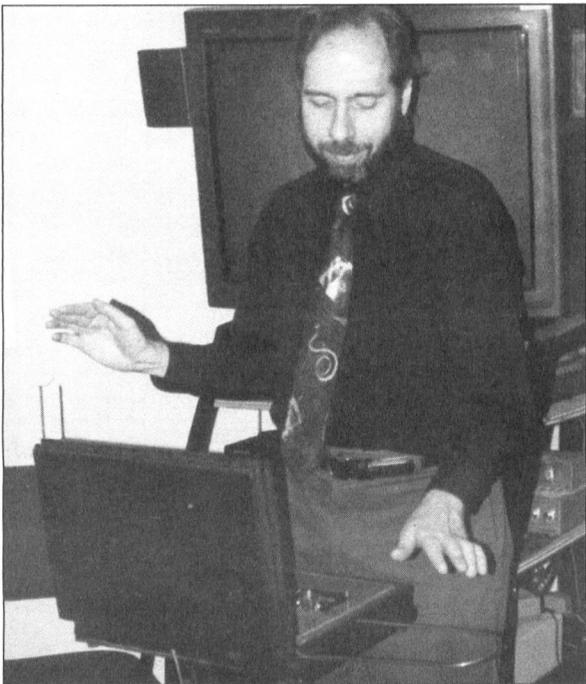
The aluminum two-seater plane assembled by turbine section chief Brian Moentenich. (Photo courtesy of North Pacific Division.)



George Kona, aircraft mechanic and friend to Brian Moentenich, inspects the riveting of a vertical stabilizer. (Photo courtesy of North Pacific Division.)



Brian Moentenich smiles from the cockpit. (Photo courtesy of North Pacific Division.)



Eric Stedfeld plays the theremin for coworkers.

NY webmaster 'feels' the music

Article by Jack Friedman
Photo by Vince Elias
New York District

The theremin is a unique musical instrument played by a performer who never touches it. The musician's hands simply move through the air near the theremin and strange, otherworldly sounds emerge — a medley of woos and wows mixed with violin-like tones and "voices" that sound like a ghostly soprano.

Eric Stedfeld, New York District's webmaster, built a theremin in about a month from a \$120 kit, plus parts from Radio Shack and thrift shops. Stedfeld put his theremin through its paces on Dec. 10 in the district's Emergency Operations office for an audience of 40.

The instrument has a vertical antenna which controls pitch and a horizontal antenna that controls volume. When turned on, the theremin sets up an electromagnetic field. When an object enters the field, it alters the instrument's sound. Hands, skillfully employed, shape the sounds to create haunting musical effects.

"It was a labor of love," said Stedfeld. "The theremin, which has almost no threshold of public recognition, has been heard from time-to-time on the soundtracks of science fiction, horror, and other thriller-type films." Among its credits — "The Day the Earth Stood Still," "Spellbound," and "Lost Weekend." It can also be heard in a couple of rare pop music appearances — the Beach Boys' "Good Vibrations," and Led Zeppelin's "Whole Lot of Love."

The world's first electronic instrument, the theremin is now experiencing a mini-revival, partly due to a recent documentary video on Leon Theremin, a Russian scientist who invented the instrument in 1918. After a demonstration of the theremin before Lenin, the inventor was sent on a world-wide tour by the Soviet regime to advertise its sophisticated technology. His tour was an international sensation, and Theremin was reluctant to return home. Ultimately, Theremin, a brilliant physicist, was kidnaped by the Soviets and returned to his homeland, where he was forced to work on military projects during World War II and the Cold War.

Rock Island dragsters peel rubber, burn gas

If you go to Cordova Dragway in Cordova, Ill., on a Friday night, you might find two Rock Island District employees roaring down the quarter-mile faster than 100 miles per hour.

Angela Grant, from Engineering Division, has a 1995 Camaro Z-28 and has been racing for two years. Her car is black with special alloy wheels and carries the popular LT-1 350 cubic inch V-8 and a six-speed transmission. Dave Husted from Information Management races a black 1989 Mustang with a 302 cubic inch supercharged V-8.

Both Grant and Husted race in Street Class. Cars in this class must be street-legal with no major speed modifications or racing tires. In fact, the rules state that Street Class cars must be driven, not trailered, to the track.

Both cars still get around 23 miles to the gallon, despite their power and having factory options including air conditioning and cruise control.

Grant's car is the fastest of the three late-model Z-28s that regularly race at Cordova, and she named it MR HYDE to go with her truck DR JEKYL. Grant's best time down the quarter-mile is 13.64 seconds at 102.7 miles per hour.

She has been racing for two years, and goes to Cordova about twice a month, usually on Friday nights. She has also raced at Memphis International Speedway.

"Dave invited me up to watch a race and I caught the bug from that," said Grant. "I've always enjoyed driving a fast boat or a good sports car, so drag-racing appealed to me."

Grant estimates that only about 10 percent of the drivers are women, but "the crowds are really enthusiastic about female drivers," she said. "I hear little guys about eight or 10 years old yell, 'Hey, there's a girl driver!'"

Husted has been racing at Cordova since high



Dave Husted, from Rock Island District's Information Management Division, flashes a print-out of his time following a recent race. His license plate reads ID NUKE U. (Photo courtesy of Rock Island District.)

school in 1987.

"My Dad used to drag-race when he was younger," Husted said. "I came from a family that enjoys fast cars, so they encouraged me to go to Cordova instead of getting in trouble racing on the street. It's a good way for kids to settle disputes about who has the fastest car. I represented Alleman Catholic High School in a Battle of the High Schools race, and that's how I got started."

Husted was just 17, so a parent had to go to the track and sign for him to race. He drove a 1965 Chevelle and took third place.

His Mustang now flies down the quarter-mile at speeds above 120 miles per hour. Because of the supercharger, he races in the Super Street Class, and he admits the ID NUKE U license plate is an intimidation factor. His best pass to date is an 11.83. Husted has also competed in the Super Street Class at Gateway International Raceway in St. Louis.

What happens in a drag race is simple, but there's more involved than just pointing the car down the track and stomping the gas pedal. Two drivers wheel their cars onto the track and do a short burnout (spin the tires) to clear sand, rocks, and dirt from the treads.

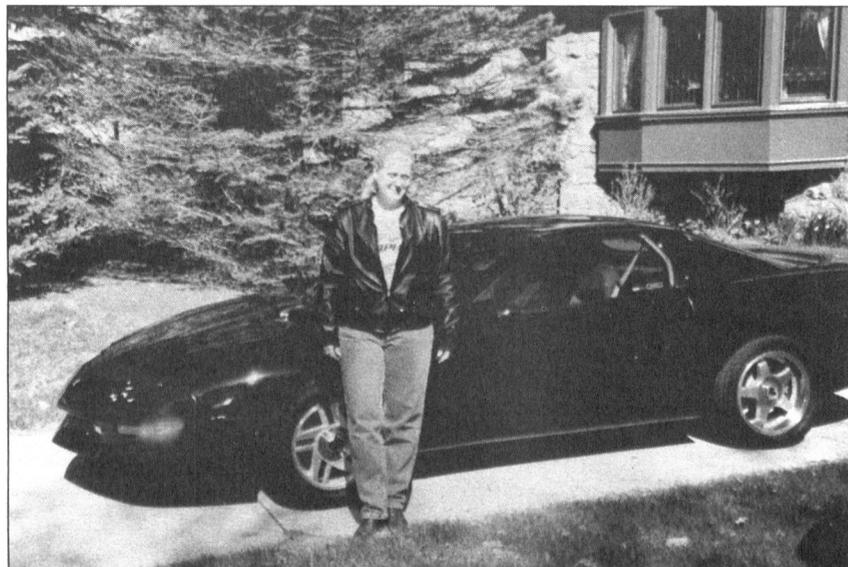
They then proceed to the waterbox, two depressions in the concrete where water is sprayed. The drivers pull through the water box, then stop to do a smoky burnout which heats the tires for better traction.

Both cars pull up to the starting light (called the "Christmas tree") and stage (get lined up using the system's lights). Three amber lights count down, and on the green light both cars tear down the track.

At the other end, the drivers proceed back up the track in a return lane and pick up their time slips at a booth.

The race is timed by an automated system; a computer gives the driver's initial reaction time, 60 foot time, 300 foot time, one-eighth mile time and speed, and quarter-mile time and speed.

(Dave Husted and Bernard Tate, "Engineer Update" editor, contributed to this article.)



Angela Grant, from Rock Island District's Engineering Division, poses in front of her car, MR HYDE, which she drag-races in the Street Class. (Photo courtesy of Rock Island District.)

'Streaming' transmits meeting in real time

Article and Photo
By Christina Plunkett
Jacksonville District

A recent Jacksonville District town hall meeting made communications history in the U.S. Army Corps of Engineers. The Information Management (IM) people used "streaming" technology to transmit the meeting in real time. Employees had the choice of viewing the meeting on their computers via the district's Intranet, on TV monitors throughout the building, or live in the conference room.

Streaming is a recent innovation in data transfer. In the past, sending data was rather like mailing a letter. A package of data (words, pictures or whatever) would be assembled, uploaded onto a computer system, then a user would download the package and read it.

Streaming is more like television. Data can be loaded into a computer network in a steady "stream" at one site and received and seen in real-time at other sites. Jacksonville District is testing the technology, and used the town hall meeting as an experiment.

What streaming means to the Corps is that business communications will never be the same. "This new technology makes it possible for all employees, including those in field offices, to participate in an event as it happens through their computers," said Jim Cobb, Chief of IM.

Just as teleconferencing and telecommunications revolutionized businesses communications, saving travel and expenses, streaming can provide opportunities for even faster communications and savings of time and money. Some obvious applications for streaming are immediate communicating of in-house and public meetings. The live video can be reduced to a corner of the computer screen so an employee can watch and listen to the meeting while working. Real-time training for field sites is another application, as is real-time video and data transmission from remote sites, deployments, or disasters.

The town hall meeting was planned on short notice and took place in Jacksonville District's executive conference room, which could hold only a fraction of the district's employees. Cobb was familiar with Real Video, a program which makes it possible

to provide video and audio production on an Intranet. (An Intranet is Internet-like communications among a local computer network.) Cobb saw this as the perfect time to try it.

This endeavor faced two challenges. The first challenge was tweaking the system to make Real Video do what they wanted. Real Video software makes it possible to transmit canned programs, but IM's goal was to present the meeting live. To do that, an encoder system had to be built from scratch. The encoder takes video off the cable, converts it to a digital format, and transmits it across the Intranet.

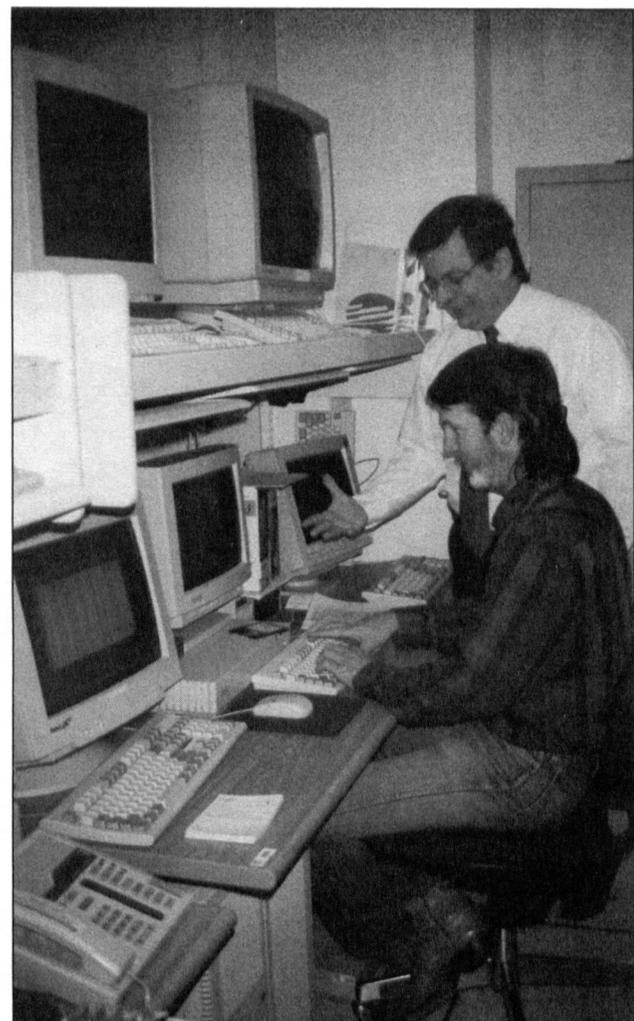
"You need a very large and fast system to construct an encoder," said Bill Hill, an IM computer specialist who made the real-time production happen. Hill created the encoder system by taking a Dual Pentium 200 megahertz computer with 256 megabytes of memory and inserting a video capture card. The card translates cable signals to a digital format that the computer will understand. A web link between the district's Intranet page and the Real Server also had to be created.

The second challenge was that everything (assembling the system, testing, adjustments and testing again) had to happen in less than a week.

"On Monday, when we were first tasked with the project, I didn't think it would be possible to provide a quality video at the required frame speed," Hill said. (Average motion requires 30 frames per second.) "I thought it would look more like a slide show than a video. But when we tested the system on Thursday, the day before the event, we were all impressed with the quality."

The new capability, and instructions on how to download Real Player to view the meeting, had to be advertised throughout the district. On Friday, the day of the town hall meeting, the system operated smoothly. The meeting was also viewed outside the district by selected employees in South Atlantic Division, and some top USACE officials in headquarters also watched the launching of a new electronic era for the Corps.

Since that first test, Cobb has been busy answering questions from other Corps districts and divisions interested in learning how to do it. Even the Cold Regions Research and Engineering Laboratory



After the server was built to support the Corps' new streaming function, Mark Byrd, seated, and Bill Hill enable the encoder system by loading the Real Logic software.

(CRREL), the first in the Corps to acquire their own hardware to become part of the World Wide Web, has inquired about this new service. "CRREL has been studying this new capability and the possible impacts to the network, such as how much traffic it creates during broadcast," Cobb said.

The next step will be expanding the live video broadcast from in-house to a remote location. Other applications are planned for the future. IM is looking at two-way Intranet broadcasting. "We hope to make it possible for field employees to ask questions of a speaker, just as if they were physically at a meeting, by typing questions on a 'white board,' which would work like the chat room feature on the Internet," said Hill. "Then the speaker could answer them."

Jacksonville hydrographic data on public server

By Christina Plunkett
Jacksonville District

The Internet is fast becoming a common tool for the U.S. Army Corps of Engineers. Jacksonville District is the latest to stake a claim in cyberspace.

When personnel in Construction-Operations Division successfully uploaded metadata (cataloging) files for Canaveral Harbor, access to the district's first Internet hydrographic survey files became a reality.

And with that accomplishment, Jacksonville District became the first district to load hydrographic survey data on the Corps' clearinghouse server, allowing public access to the latest survey information for ports and harbors throughout Florida and Puerto Rico.

Fran Woodward, civil engineering technician, and Duane Trabits, programmer analyst, have been the key players on this initiative. Dyntel Corporation was the contractor.

Trabits uploaded the survey data. This included incorporating templates that proved to be ineffi-

cient and had to be changed, loading the metadata files, marrying all the data into one hydrographic survey file for transfer, compressing this file, and using a program that enables the file to automatically decompress for easy public access. Throughout this process, Trabits worked with Woodward, who provided the survey information for the metadata file.

Bruce Tappmeyer, mechanical engineer, was also instrumental in acquiring the log-in IDs and passwords for the Cold Regions Research and Engineering Laboratory (CRREL) server so that copying the data to the server could be accomplished.

To date, the latest information on all 14 deep-draft harbors that the district operates and maintains are available on the CRREL server. The files will be updated as new surveys are performed.

The latest survey data on these ports can be viewed by getting on the web site at http://corps_geol.usace.army.mil. Information available includes survey location, date, time, coordinate systems, survey procedures, survey equipment used, points of contact, what the survey file contains,

and any modifications to date.

The idea to provide survey data on the Internet came about when the National Geospatial Data Clearinghouse Committee requested that all federal government agencies provide a kind of "card catalogue" of hydrographic facts for the ports they service. President Clinton issued an executive order stating the requirements and guidance for submitting the information to the "National Spatial Data Infrastructure."

Jacksonville District immediately obtained three server IDs and passwords from CRREL so files could be created to place the latest hydrographic survey information for district ports.

Placing the hydrographic survey holdings on a public access website makes it possible for anyone with Internet access (such as a boat captain, port director, or federal agency) to download the most up-to-date survey information available in the district. This services district customers faster, and cuts reproduction and mailing costs and time, and contributes to building a national geospatial database of information.

Around the Corps

ISO certification

Portland District recently received its certification as an ISO 9001 organization. The certification follows a two-year internal analysis and clarification of the district's business processes. Portland District's certification is the second in the Corps; Louisville District was certified earlier in 1997.

Experts from Lloyd's Register Quality Assurance Limited of Houston, Texas, performed the audit. They compared the district's business processes with standards recognized worldwide. Planning and Engineering Division received the award. The division plans and designs civil works projects such as fish passage facilities; geology and soils engineering; hydraulic design; sedimentation and water quality studies; concrete design work; architectural design; and surveying and photogrammetry studies. Its people were also involved in designing most federal dams, navigation locks, and flood and erosion facilities in the region.

"The certification process helped us properly identify and clarify our work processes, integrate the ISO concept, and monitor results to see that the standards are followed," said Howard Jones, division chief. Jones said the ISO process will result in better products from clarified product development and increased interaction with its customers. "We really had to look seriously and earnestly at how we do things."

State park cleanup

New England District has let a contract to clean-up World War II ordnance from Mile Beach at Reid State Park in Georgetown, Maine. The cleanup, which began Nov. 24 and ended in mid-December, is funded by the federal government and cost about \$82,000.

Mile Beach was a practice range for American and Canadian pilots training at the Naval Air Station in Brunswick, Maine, during World War II. Planes would approach the site and fire five-inch rockets. Developed in 1944, the site was used for about two years before becoming inactive in 1946.

The contractor concentrated on a four-acre area of Mile Beach to find and remove shells, rocket motors, and other ordnance. All shells uncovered during the cleanup were pierced or broken open. Since records indicate only inert shells were used at the site, no shells had to be detonated.

Reid State Park is operated by the Maine Department of Conservation and attracts about 200,000 visitors a year. Work was done on weekdays only, and during work the park was closed to the public. As a precaution, a 4,000-foot exclusion zone was established around the work area. The park remained open on weekends.

Keep America Beautiful award

The Annual Sardis Lakeshore Cleanup Day, held each September at Sardis Lake in Northern Mississippi, recently took second place in the Keep America Beautiful 1997 Awards Competition. A national panel of judges representing the public, private and government sectors, selected the Sardis Lake Cleanup Day from a nationwide field of applications. The Sardis Lake Field Office was invited to attend the National Conference on Dec. 6 in Washington, D.C., to accept the award, which was presented by Vice President Al Gore.

Since its inception in 1987 the Sardis Lakeshore Cleanup Day has attracted 3,200 volunteers from around the state. They've spent 17,300 hours removing 22 tons of garbage from the shores of Sardis Lake. The 1997 cleanup effort yielded two tons of garbage.

The event has also received both national and state recognition via the Take Pride in America Program, and has twice been recognized by the People Against

Litter/Keep Mississippi Beautiful Campaign, for its litter control efforts.

Design Agent of the Year

Seattle District was named "Design Agent of the Year" by the Air Force's Air Combat Command (ACC) in early November. The award focused on five major achievements:

- Meeting design milestones.
- Completing design below cost and on or ahead of schedule.
- Minimizing lost design effort.
- Innovative design techniques.
- Unique managerial ability.

The district was nominated for the award by the ACC's program manager for Mountain Home Air Force Base.

Engineer Dinner

The 1998 Engineer Dinner, hosted by Lt. Gen. Joe N. Ballard, Chief of Engineers, will be held Feb. 26 at 6:30 p.m. in the Koran Room of the Fort Myer Officers Club.

All active, Reserve, and retired commissioned and noncommissioned engineer officers, plus all civilian and military personnel of the Corps of Engineers, active and retired, are invited.

The attire is Army mess dress or Army blue with bow tie. Civilian is black tie optional.

The cost is \$34 per person, and the menu will be sliced tenderloin of beef in cabernet sauce.

Mrs. Joe (Tessie) Ballard invites the spouses of Engineer Dinner guests to join her for dinner and good company the same evening in the Abrams/Chaffee Room of the Fort Myer Officers Club at 6:30 p.m. The cost is \$24, and the program will include a basket auction to benefit the Pediatric Unit of Walter Reed Army Hospital.

RSVP to the USACE Protocol Officer by Feb. 12, phone number (202) 761-1220.

Small business fair

Small businesses in Arizona got a big business boost at a recent Small Business Vendor Fair (SBVF), sponsored by Los Angeles District. In December more than 200 contractor representatives, and numerous federal, state and local agencies met in Phoenix (and 100 in Tucson), to learn more about business opportunities with the Corps and other agencies.

Los Angeles District Commander Col. Robert L. Davis told attendees that the district awarded more than \$135 million in contracts to small businesses in 1997. "In fact, 50 percent of our contracts in fiscal year 97 were awarded to small business enterprises," Davis said. "This reflects the importance small business has in our operations. That's the reason we're hosting these events, to provide you a greater awareness of contract opportunities."

Participating activities included Yuma Proving Grounds, Fort Huachuca, Luke Air Force Base, Davis-Monthan Air Force Base, Defense Logistics Agency, Small Business Administration, Government Service Agency, Electronic Commerce Resource Center, the State of Arizona, Maricopa County, Pima County, City of Phoenix, City of Tucson, and the Pima County Community College Small Business Development and Training Center.

Flood control win/win

Due to the continuing threat of severe flooding in the Los Angeles County Drainage Area, the Los Angeles County Department of Public Works and crews from Los Angeles District's Construction Operations Division have been working overtime to clear flood control channels.

The crews began removing almost 200 palm trees from the Verdugo Wash flood control channel in Glendale, Calif., on December 1. They also removed more than 100,000 cubic yards of soil from Verdugo. Dave Weaver of Engineering Division came up with the idea to donate some of the palm trees to Glendale Community College where they were planted. About 50,000 cubic yards of material from Verdugo was trucked to the Scholl Canyon landfill in Glendale.

The Corps benefited from not having to rent equipment to shred the trees and pay to dump the material in a landfill. The college benefited from saving the purchase of mature palm trees that probably would cost \$2,000 each on the open market. Glendale benefited from not having to purchase earth for landfill cover valued at \$4.4 million.

Kuwait Police College

A new \$100 million police college will soon rise on a 70-acre site in Kuwait City, following consultations between experts from the government under direction of New York District, and the project architect/engineer, Skidmore Owings & Merrill. The Kuwait Police College will be built in the Mubarakkiya area of the city. One third of it will be structures, and two-thirds will be fields and ranges. The district's role as consultant through a technical assistance agreement was a first for New York District and one of only seven for both the Corps and the entire Army.

The college will be used to train 1,200 cadets who will serve in both police and military roles, thereby posing unique design requirements. These compelled Skidmore to retain the expertise of the Corps, plus the State Police of Georgia who built a police academy in Atlanta in anticipation of the Olympic games.

The project requirements include Police College, Athletic & Military Training and Teaching Building, Police Academy Administration Building, Essential Police Training Fields, Social Facilities (including a mosque and an officers' and soldiers' mess), and all the infrastructure.

The district's consultants include West Point Military Academy and the Huntsville Engineering and Support Center. Skidmore is expected to present its final design to Kuwait's Ministry of the Interior in seven months.

Correction

The article "Home gardening tool protects aquatic plants" in the December *Engineer Update* was written by Barbara Cravens of the Tulsa District Public Affairs Office.

TSU partnership

Nashville District and Tennessee State University (TSU) strengthened their long relationship when they signed a partnering agreement establishing Nashville District as the Corps' focal point for contact with TSU students and faculty.

With this new agreement, the Corps can take advantage of the personal contacts and high visibility Nashville District has developed at TSU, an historically black university. Students and faculty will be better able to access information on all of the Corps' missions, even those beyond the geographical limits of the district. TSU students who plan to work at any Corps project for a summer or for their career will find ready placement assistance and personal guidance.

"Our ultimate goal is to provide an additional source of opportunities for qualified minorities to be competitively drawn into a more diverse workforce," said Marva Morris, Chief of the district's Equal Employment Opportunity Office. "Tennessee State attracts students from all over the country. We will assist other districts in linking up with people at TSU."

Liz of Arabia:

Reflections on 20 years in the Saudi Kingdom



Twenty years ago, Liz Dugan would have questioned the sanity of anyone suggesting that she would spend two decades in Saudi Arabia. (Photo courtesy of Transatlantic Programs Center.)

By Liz Dugan
Transatlantic Programs Center

When I first arrived in Saudi Arabia at the age of 26, if someone had told me that I would live here for more than 20 years, meet my future husband, survive a war with Scud and Patriot missiles flying overhead, and *still* be here after two terrorist bombings, I would have thought they were *crazy!*

But here I am, still.

I arrived on Thanksgiving Day 1976 from South Atlantic Division in Atlanta, where I worked in engineering division. I was hired by John Blake, chief of construction for the Middle East Division and, looking forward to a new adventure, had agreed to work in Saudi Arabia for one year. The U.S. Army Corps of Engineers had just moved from the Mediterranean Division in Livorno, Italy, and I had heard they were launching a 10-year project. I was asked to help set up offices in Riyadh and Jeddah.

Little did I know how much I would enjoy living in the Middle East. Without this job, I never would have traveled throughout the world and never would have met so many wonderful people of all nationalities, both within and outside the Corps.

My arrival in the Kingdom began with my long trip from Atlanta through London and on to Riyadh (via Jeddah). It was getting close to Hajj, the annual pilgrimage to Mecca which every Muslim is supposed to make at least once in his life. As we approached Jeddah airport, the Muslims began changing into their white robes. I assumed this was the normal dress code for Saudi Arabia.

In Jeddah airport, which was divided into two terminals, I had to walk down the street from the international terminal to the domestic, stepping over thousands of people waiting for buses to Mecca. At the domestic terminal, the electricity went out and passengers were walking around in the middle of the night holding lighters and matches.

I had befriended a Pakistani man on the flight who made sure I didn't get lost in the shuffle or I would *still* be lost in Jeddah. By the time I reached Riyadh at 3:30 a.m., I was so happy to see John and Donna Blake, my sponsors, and Bakheet Al-Maliki, who is affectionately nicknamed "Superman." Superman is the Corps' administrative manager and expeditor who has spent 25 years helping people get where they need to with the least red tape. This was my first adventure with Superman and we have been friends ever since.

We refer to the late 1970's in Saudi Arabia as the "good old pioneer days," when Saudi Arabia was modernizing its fast-growing cities. All expatriates suffered from similar growing pains -- electricity failures and fluctuations, water problems, few paved roads, and no traffic lights. There was a wide variety of accommodations, everything from small apartments with mismatched furniture and appliances, to huge villas scattered around the city. Corps headquarters was in a palace with goat herds roaming through and eating all our vegetation.

But we all loved it and worked our way through the inconveniences. It was so exciting and so completely different from our normal lives elsewhere.

When my first year was up, it was

an easy decision to stay. I was dating Paul and I had met new friends and there was a great camaraderie among our members. I met Paul at a Corps holiday party the first month I arrived and we were married 21 months later on Sept. 13, 1978. Paul is now general manager for the Central Region at British Aerospace.

To show how close the Corps group in Saudi Arabia was, there have been two reunions in Florida. Paul and I managed to attend the last one and it was absolutely wonderful. I ran into people I had not seen in more than 15 years and they arrived from all parts of the world, many retired but many more still working for the Corps.

I travel to the U.S. at least once a year and sometimes twice. My parents have visited us here twice. I've also had the opportunity to travel to Aqaba and Petra, Jordan and throughout Saudi (Taif, Tabuk, Khamis Mushayt, Jeddah and Dhahran).

There have been some scary times. During Operation Desert Storm the adrenaline was pumping for everyone and we had to make sure we were in safe havens when the alert went off. We all knew that with the allied troops here, it would be over soon. We just needed to stay calm and we did this surpris-

ingly well. I and many others were awarded two medals after Desert Storm.

The bombing at the Saudi Arabian National Guard building in 1995 was tough because it was so close to home and we knew some of the victims. Since the Khobar Towers bombing in 1996, things have changed -- with families being sent home, everyone on one-year tours and offices and quarters moving to Eskan Village. We are now more cautious and aware of our surroundings.

The Corps has been good to me. I first started working for the Corps in September 1974 in Atlanta as a secretary. Since arriving in Riyadh as a secretary in 1976, I have been an administrative assistant, management assistant, management analyst, logistics management specialist, and just recently an executive assistant.

I always tell the newcomers, your first 10 years are the toughest.

(Editor's note: Liz Dugan works for the Ordnance Program Division (OPD), OPD, headquartered at Eskan Village, Saudi Arabia, is an element of Transatlantic Programs Center. OPD works with the Saudi Arabian Army Ordnance Corps and the Royal Saudi Land Forces. OPD provides financial management, contract administration, and Foreign Military Sales case oversight.)



Looking back on her 20 years in Saudi Arabia, Liz Dugan is grateful for the opportunities to see places and meet people all over the world. (Photo courtesy of Transatlantic Programs Center.)